

# Bridging Health Divides: Remittances and Health Expenditure in Nigeria<sup>[1]</sup>

Onyekachukwu Ernest Ebenebe<sup>1</sup>, Ifunanya Miracle Ejimigini<sup>2</sup>, Uju Regina Ezenekwe<sup>3</sup>, Christopher U. Kalu<sup>4</sup>

<sup>1,2</sup>Department of Economics, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Nigeria

<sup>3,4</sup>Department of Economics, Nnamdi Azikiwe University, Awka, Nigeria

DOI: <https://dx.doi.org/10.47772/IJRISS.2024.809003>

Received: 12 August 2024; Accepted: 31 August 2024; Published: 26 September 2024

## ABSTRACT

Health expenditure is crucial for ensuring access to essential medical services and infrastructure, directly impacting individuals' well-being and longevity. Adequate investment in healthcare can alleviate the burden of disease, enhance health outcomes, and bolster societal productivity and prosperity. Remittances, particularly significant in developing countries, play a vital role in households' ability to access quality healthcare and medications, yet previous studies have often overlooked private and out-of-pocket health expenditures, primarily relying on micro-investigation. Using quarterly data from 2000Q1 to 2020Q4, this study examined the impact of remittances on health expenditure in Nigeria, revealing a significant positive influence on private and out-of-pocket health expenditure but not on general government health expenditure. Recognizing this impact, policymakers should incentivize investment in private healthcare infrastructure to enhance service quality, while also focusing on initiatives to facilitate healthcare access and promote financial inclusion among recipients to optimize the benefits of remittances. Additionally, exploring public-private partnerships in the healthcare sector can further leverage remittance funds to improve overall healthcare access and quality.

**Keywords:** Health expenditure, Nigeria, Remittances

## INTRODUCTION

Over the past two decades, Nigeria has grappled with the challenge of insufficient health expenditure, a situation that has hindered the nation's progress towards achieving comprehensive healthcare coverage (Azolibe et al., 2022). Despite efforts to address this issue, the average allocation towards health provision has barely surpassed 3%, falling significantly short of what is necessary for ensuring universal access to essential services (World Bank, 2023). Between 2000 and 2019, government-funded health expenditure per capita in Nigeria remained notably inadequate, averaging just \$10.44, while private expenditure soared to \$52.64 (World Bank, 2023). These figures starkly contrast with the estimated \$86 required per capita to adequately support universal health coverage, as outlined by the World Health Organization (2022). Moreover, domestic public health expenditure as a percentage of the gross domestic product (GDP) remained dismally low at 0.51%, falling well below the recommended 4-5% of GDP needed to achieve universal health coverage (World Health Organization, 2022). The Abuja Declaration of 2001 set a target of allocating 15% of the gross government expenditure to healthcare (Awoyemi et al., 2023), highlighting a significant shortfall in healthcare financing in Nigeria.

However, Nigeria has consistently fallen short of this goal, with government health expenditure representing

only 3.38% of gross government expenditure (World Bank, 2023). Compounding the issue, Nigeria's reliance on volatile oil revenues, which are susceptible to fluctuations in global oil prices (Nwokoye et al., 2020; Nwokoye et al., 2022), has led to inconsistent levels of both recurrent and capital expenditures in the health sector. While recurrent government spending on healthcare has seen some increase, capital expenditure has been subject to significant fluctuations, with figures dropping to less than 195 billion naira in 2020 (Awoyemi et al., 2023). This pattern indicates a prioritization of healthcare goods and services over investments in health-related infrastructure and equipment. While public expenditure on health is intended to enhance healthcare accessibility for the impoverished and reduce catastrophic healthcare costs for households, the burden of out-of-pocket expenditure has continued to rise. Household out-of-pocket expenditure rose from 60.2% in 2000 to 74.5% in 2020, reflecting the strain placed on individuals and families. Private expenditure has dominated the healthcare financing landscape, accounting for 70-75% of total health expenditure, with more than 90% of this coming from out-of-pocket expenses (World Bank, 2023). External health expenditure, though present, constitutes a smaller portion, ranging from 10-15% of total health expenditure (World Bank, 2023)

Amidst shrinking health budgets, remittances representing the share of a migrant's earnings sent from their destination country back to their place of origin are emerging as one of the significant factors influencing health expenditure (Nwokoye et al., 2020, Khan, 2024). Nigeria stands out as one of the leading recipients of remittances in Africa, with an estimated 17 million Nigerians, comprising 12% of the nation's population, residing abroad, primarily in developed European and North American countries, as well as neighbouring African nations (Fidelis, 2017; Cooper & Esser, 2019; PwC, 2019).

The socio-economic challenges prevalent in Nigeria, exacerbated by factors such as inadequate infrastructure, insecurity, persistent unemployment, and inflation (Ekesiobi & Dimnwobi, 2020), have driven a significant brain drain, with highly skilled and educated Nigerians seeking opportunities abroad (Bailey, 2022). Remittances have evolved into one of Nigeria's primary external financial inflows since the mid-2000s. According to World Bank statistics (2023), remittance inflows surged from US\$1 billion in 2003 to US\$18 billion in 2007 and US\$19 billion in 2008. This significant increase was attributed to banking sector reforms that bolstered trust in formal remittance channels, coupled with advancements in information and communication technology (ICT) facilitating faster and more secure international transactions. While remittance inflows climbed to \$24 billion in 2018, they declined to US\$17 billion in 2020 due to the pandemic's adverse impact on migrant workers' wages and employment. It climbed to \$20 billion in 2022 (World Bank, 2023). Despite trailing behind countries like India, Germany, France, and China in aggregate remittance inflows, Nigeria boasts a higher remittance-to-GDP ratio (4%) than any of these nations. The significant inflow of remittances has the potential to boost health expenditure in Nigeria. These funds can be directed towards enhancing healthcare infrastructure, expanding access to medical services, and supporting public health programs. By supplementing government budgets, remittances can improve healthcare access, reduce financial barriers, and strengthen the healthcare workforce. Overall, remittances offer a valuable opportunity to invest in healthcare and improve health outcomes for Nigerians.

In light of the foregoing, this study seeks to explore the following research questions: (1) What is the impact of remittances on government health expenditure in Nigeria? (2) What is the effect of remittances on private health expenditure in Nigeria? (3) Do remittances significantly impact out-of-pocket health expenditure in Nigeria? In answering these research questions, this study contributes to the literature in the following ways. While previous studies on remittances and health expenditure have primarily focused on general government health expenditure, this study takes a more comprehensive approach by including private and out-of-pocket health expenditures in its analysis. This disaggregation offers a nuanced understanding of healthcare funding allocation. General government health expenditure reflects public health initiatives, while private expenditure underscores individual investments in healthcare. Additionally, out-of-pocket spending indicates the direct financial burden on individuals, which is crucial for assessing healthcare

accessibility. By examining these components, the study offers a comprehensive perspective on the interplay between remittance inflows and healthcare financing, enriching our understanding and informing policymakers about diverse funding sources and implications for accessibility. Moreover, unlike previous studies relying on household-level or nationally representative datasets, this study employs time series data. This approach allows for a thorough analysis of the relationship between remittances and health expenditure over consecutive time intervals, offering insights into trends and correlations. By departing from conventional methods and using time series analysis, the study uncovers nuanced relationships and comprehends the long-term implications of remittance flows on healthcare financing. Furthermore, the study utilizes the canonical cointegrating regression (CCR) technique, a robust method for analyzing long-term relationships between non-stationary time series variables. Unlike traditional regression, CCR considers multiple cointegrating vectors, providing a more accurate assessment of equilibrium relationships over time. By employing CCR, the study effectively captures the dynamics between remittance inflows and health expenditure and offers reliable estimates

The remaining sections of this study are structured as follows: The second section briefly summarizes the related empirical literature. Section 3 presents the methodology and dataset. Section 4 presents the empirical results. Finally, Section 5 concludes the paper

## RELATED LITERATURE

Several studies have examined the impact of remittances on healthcare expenditure across different countries. Kalaj (2015) found that in Albania, households receiving remittances tend to increase their spending on medicines and health services. Shoab (2016) discovered a similar trend in Pakistan, with remittance-receiving households allocating more funds to both clinical services and medications compared to non-receiving households, across rural and urban areas. Chezum et al. (2018) observed in Nepal that remittance income correlates with increased spending on higher-priced medical care and higher doctor visitation rates. Petreski et al. (2018) focused on Macedonia, finding that remittances significantly improve health consumption, thereby reducing poverty and the incidence of poor health among recipients. Berloff and Giunti (2019) explored Peru and concluded that international remittances positively affect healthcare expenditure, suggesting an increase in health budget allocation. Valatheeswaran and Khan (2020) conducted a micro-study in Kerala, India, revealing a positive impact of remittance income on household healthcare expenditure.

Similarly, Kapri and Jha (2020) examined Nepal, observing a significant increase in healthcare expenditure with rising remittance inflows, especially in households with migrant family members. Kan (2021) in Tajikistan and Islam et al. (2021) in Bangladesh both found that remittances significantly influence health expenditure positively. Ajefu and Ogebe (2021) broadened the scope to five Sub-Saharan African countries, demonstrating that international remittances lead to higher spending on various essentials, including health. Cheema and Nadeem (2022) in Pakistan and Raihan et al. (2022) in Bangladesh echoed similar findings, emphasizing the positive impact of remittances on health spending. Khan (2024) investigated the influence of migrant remittances on development outcomes across 61 developing nations, analyzing indicators such as health expenditures, school enrollment rates, and economic growth. The study revealed a significant and positive correlation between migrants' remittances and key development metrics, including improvements in health expenditure, education, and overall economic growth.

Conversely, Kakhkharov et al. (2021) in Uzbekistan discovered a negative effect of remittances on healthcare spending, alongside insignificant effects on education expenditure. Wang et al. (2021) in Kyrgyzstan found limited effects of remittances on overall household spending, with minimal changes in food and medical expense shares. In Cambodia, Treleaven (2019) noted that while households with remittance income may have access to more resources, they are less likely to seek formal biomedical care

for childhood illnesses, indicating a nuanced relationship between remittances and healthcare spending and utilization.

While existing research provides valuable insights into the impact of remittances on health spending, notable gaps remain. We observed from the literature survey that prior studies predominantly relied on general government health expenditure as a proxy for overall health expenditure. To address this shortcoming, we adopt a more comprehensive approach by incorporating government, private, and out-of-pocket health expenditures into our analysis. This disaggregation provides a nuanced understanding of healthcare funding allocation and sources within a given context. Additionally, previous studies have mostly focused on household-level or nationally representative datasets. This study overcomes this limitation by utilizing time series data, which allows for a detailed analysis of the relationship between remittances and health expenditure over consecutive time intervals, enabling the exploration of trends and correlations

## METHODOLOGY

### Theoretical Framework

The theoretical framework is anchored on the Grossman model of health production, developed by Michael Grossman (Grossman, 1970). Grossman (1970) views health as a form of human capital that individuals invest in to improve their well-being and productivity. According to Grossman, individuals allocate resources towards health-related activities to increase their health capital, which depreciates over time due to factors like ageing and lifestyle choices. The model includes a production function that transforms health inputs into health outcomes, reflecting the relationship between health investments and health status. Individuals make decisions about health investments based on factors like income, education, age, and the price of health-related goods and services. The model also considers the allocation of time and effort towards health-producing activities, highlighting the trade-offs individuals make between present health investments and future health benefits.

Suppose the economy consists of  $N$  households and a government that imposes taxes ( $T$ ) on the households and also makes transfer payments ( $Tr$ ) to the households. Following Rous and Hotchkiss (2003), the health expenditure function is given by

$$H = f(Y^\alpha P^{1-\alpha}) \quad 3.1$$

Where  $H$  is the health expenditure function,  $Y$  is the income level, and  $P$  is population growth.

Equation 3.1 indicates that health spending is largely contingent on income level and population growth. However, as argued by Grossman, health is a merit good and requires government investment. Thus, the health function will depend on government budgetary allocation and fiscal position. Thus, Equation 3.1 becomes:

$$H = \Phi_1 Y + \Phi_2 P + \Phi_3 GOR + \Phi_4 FIS + \Phi_4 z \quad 3.2$$

Where  $\Phi_i$  is the impact coefficient,  $GOR$  = government revenue,  $FIS$  = government fiscal stance, and  $z$  = other variables

### Model Specification

This study aims at ascertaining the impact of workers' remittance on health spending. In line with the objectives of the study, the following models are set as follows.

**(a) Impact of remittance on government health expenditure**

From Equation 3.2,

$$H = \Phi_1 NI + \Phi_2 POPG + \Phi_3 GOR + \Phi_4 FIS + \Phi_4 z \tag{3.3}$$

Suppose all health spendings are done by the government, then  $H = GHE$  (government health expenditure). As opined by Awojobi (2013), workers' remittance is considered as income in the recipient economy. Entering the health expenditure function, we have:

$$GHE = \Phi_1 NI + \Phi_2 POPG + \Phi_3 GOR + \Phi_4 FIS + \Phi_4 REM + \Phi_4 z \tag{3.4}$$

Where  $REM = workers\ remittance$

According to Drabo and Ebeke (2010), government health spending is influenced by government debt (GOD), and the state of health insurance schemes (HEI). Incorporating these and specifying in econometric form yields:

$$GHE_t = \Phi_1 NI_t + \Phi_2 POPG_t + \Phi_3 GOR_t + \Phi_4 FIS_t + \Phi_5 REM_t + \Phi_6 GOD_t + \Phi_7 HEI_t + \varepsilon \tag{3.5}$$

Where  $\varepsilon$  is the stochastic error term.

**(b) Impact of remittance on private health expenditure**

As argued by Rous and Hotchkiss (2003), private health spending function diverges significantly from government health spending. Azizi (2021) opines that when remittance becomes predictable, it becomes part of the household budget because the household now considers it as permanent income. Also, personal income, rather than national income matters for private health spending. Also, while government debt matters for government health spending function, credit to the private sector is what matters for private spending. Thus,

$$PHE = \Psi_1 REM + \Psi_2 PCI + \Psi_3 CPS + \Psi_4 z \tag{3.6}$$

Adams and Cuecuecha (2010) further argued that private health spending could be influenced by macroeconomic variables such as inflations, exchange rate and unemployment. Rewriting the model, we have:

$$PHE_t = \Psi_1 REM_t + \Psi_2 PCI_t + \Psi_3 CPS_t + \Psi_4 INF_t + \Psi_5 EXR_t + \Psi_6 UEM_t + u \tag{3.7}$$

Where  $INF = inflation$ ,  $EXR = exchange\ rate$ , and  $UEM = unemployment$

**(c). Impact of remittance on out-of-pocket health expenditure**

According to Gupta and Chowdhury (2014), out-of-pocket health spending (OHE) is a function of health insurance (HEI), savings (SAV) and tax (TAX). Das et al (2020) added that out-of-pocket health expenditure could be influenced by remittance, unemployment, and personal income. In this regard, the model of OPE will be written as:

$$OHE_t = \Psi_1 REM_t + \Psi_2 PCI_t + \Psi_3 HEI_t + \Psi_4 SAV_t + \Psi_5 TAX_t + \Psi_4 UEM_t + e$$

Where  $e$  = the stochastic error term, and other variables are as defined earlier.

**(d) Model Justification**

The thrust of the study is to ascertain the impact of remittance inflow on health expenditure. Studying the impact of remittances on health spending is vital to understanding how these financial transfers affect healthcare affordability, access, and outcomes. According to Das et al (2020), remittances serve as a significant income source for many households, particularly in developing countries, influencing their ability to access quality healthcare services and medications. Analyzing this relationship provides insights into economic well-being, healthcare access, and policy implications for healthcare financing and social protection programs.

Health expenditure was disaggregated into general government health expenditure (GHE), private health expenditure (PHE, and out-of-pocket health expenditure (OHE). Disaggregating health spending into GHE, PHE, and OHE provides a comprehensive understanding of the allocation and sources of healthcare funding. GHE reflects the government’s commitment to public health, while PHE highlights individual and household investments in healthcare. OHE captures the direct financial burden borne by individuals for medical expenses, reflecting the accessibility and affordability of healthcare services. In the GHE model, the inclusion of government debt (GOD), government revenue (GOR), government fiscal stance (FIS), and national income (NI) is justified to assess the impact of fiscal policy, economic conditions, and government budget decisions on public health expenditure (Awojobi, 2013; Igbinegion & Mogbolu, 2023). Following Rous and Hotchkiss (2003) and Azizi (2021), per capita income (PCI) and credit to the private sector (CPS) are included in the PHE model to analyze the influence of economic well-being and financial access on private healthcare spending. In the OHE model, personal savings (SAV), taxes (TAX), and unemployment (UEM) are included to explore how household financial stability, tax policies, and economic uncertainties affect out-of-pocket health spending patterns.

Table 3.1: Variable description

S/N	Variable	Description	Apriori expectation
1	General government health expenditure (GHE):	Total amount of funds allocated by the government for healthcare services and programs.	dependent
2	Private health expenditure (PHE):	Total expenditures incurred by individuals, households, or private entities on healthcare services and treatments.	dependent
3	Out-of-pocket health expenditure (OHE):	Direct payments are made by individuals at the point of service for healthcare expenses not covered by insurance or public health programs.	dependent
4	Remittance (REM)	Financial transfers sent by individuals working abroad to their home country either in cash or in kind	+
5	National income (NI)	Total income earned by a country’s residents and businesses within a specific period.	+
6	Government debt (GOD)	The total amount of money owed by a government at all levels (federal, state and local government) through borrowing, including domestic and external debt	+

S/N	Variable	Description	Apriori expectation
7	Government revenue(GOR)	Total income generated by the federal government through taxes, oil sales and other sources.d	+
8	Health insurance (HEI)	Coverage that provides financial protection for medical expenses and services. It was proxied using the total assets of the insurance sector	-
9	Population growth (POPG)	The rate at which the population of a region or country increases over time.	+
10	Fiscal stance (FIS)	The government's position on spending and taxation influences the economy. It was proxied using fiscal deficit	+
11	Per capita income (PCI)	Average income earned per person in a specific area.	+
12	Credit to the private sector (CPS)	Total amount of funds lent to private businesses and individuals by financial institutions.	+
13	Inflation (INF)	Annual (year over year) increase in the general price level of all goods and services in an economy.	-
14	Exchange rate (EXR)	Value of one currency in terms of another currency. It was proxied using the official rate of the naira price of one dollar	-
15	Unemployment (UEM)	Number of individuals who are actively seeking employment but are currently without a job.	-
16	Personal savings (SAV)	Income that is not spent or consumed and instead kept for future use.	-
17	Taxes (TAX)	Compulsory financial charges are imposed by the government on individuals and businesses to fund public expenditures. Proxied using indirect taxes	-

Source: Researchers Computation (2024)

### Estimation Techniques and Procedure

The main estimation technique is the canonical cointegrating regression (CCR) framework. However, before estimating both models, the time series properties of the data were investigated using unit root test and cointegration test. The subsections that follow show a brief discussion of the econometric procedure and methods used in the study.

#### (a) Stationarity Test

A series is said to be (weakly or covariance) stationary if the mean and autocovariance of the series do not depend on time (Dimnwobi et al., 2022a; Dimnwobi et al., 2022b; Okafor et al., 2022). Any series that is not stationary is said to be nonstationary (Ezenekwe et al., 2023, Okere et al., 2023a; Okere et al, 2023b, Dimnwobi et al, 2023c). The study examined the random nature of the variables by testing for stationarity using the augmented Dickey-Fuller (ADF) test. The decision rule was based on a 5% level of significance for acceptance or rejection of the null hypothesis ( $\beta_i = 0$ ; has unit root:  $i = 1, 2, 3 \dots k$ ). At this level, the study tests for the stationarity or otherwise of each of the explanatory variables and also examines the order of integration of each of them (Asteriou & Hall, 2015; Enders, 2015).

### **(b) Cointegration Test**

The notion of cointegration among variables has introduced a new flexibility into the modelling of economic time series (Onuoha et al., 2023a; Onuoha et al., 2023b, Okere et al., 2024). As defined by Engle and Granger (1987), two variables are cointegrated (of order (1, 1)) if each variable individually is stationary in first differences (integrated of order 1), but some linear combination of the variables is stationary in levels (integrated of order 0). Many economic variables might plausibly be cointegrated when correctly measured, sometimes in natural or sometimes in log units; examples are consumption and income, short and long-term interest rates, and stock prices and dividends (Nwokoye et al., 2024). This study also estimated the long-run relationships among variables using the Philip-Oualiris cointegration analysis. The essence of this is to test for the presence of cointegrating vectors in the model and the rejection of the null hypothesis of no cointegrating vector in the model, at a 5% level of significance.

### **(c) Canonical Cointegrating Regression Framework**

Canonical Cointegrating Regression (CCR) was introduced by Park (1992). The CCR procedure involves data transformation that uses only the stationary component of a cointegrating model. A cointegrating relationship supported by the cointegrating model would remain unchanged after such data transformation. The CCR transformation makes the error term in a cointegrating model uncorrelated at zero frequency with regressors. Therefore, the CCR procedure yields asymptotically efficient estimators and provides asymptotic chi-square tests that are free from nuisance parameters (Park, 1992). According to Park (1992), the CCR transformations asymptotically eliminate the endogeneity caused by the long-run correlation of the cointegrating equation errors and the stochastic regressors innovations, and simultaneously correct for asymptotic bias resulting from the contemporaneous correlation between the regression and stochastic regressor errors. In other words, CCR generates efficient estimates in the face of multicollinearity. Estimates based on the CCR are therefore fully efficient and have the same unbiased, mixture of normal asymptotic (Nkoro & Uko, 2019).

### **Source of Data**

The models were estimated using quarterly time series data spanning from 2000 to 2020. We obtained the annual time series from the CBN Annual Report and Statement of Accounts and CBN Statistical Bulletin (various Issues) as well as World Bank development indicators. Then, we employed the frequency conversion procedure as utilized in Fernández (1992) to obtain the quarterly time series. All model estimations were implemented using the quarterly time series.

## **EMPIRICAL RESULTS**

### **Evaluation of Time Series Properties**

Before estimating the models of the impact of remittance on health spending, the time series properties of the data were evaluated using unit root test and cointegration test. The results are discussed below.

#### **(a) Unit Root Test**

Unit root tests are tests for stationarity in a time series. To ascertain the presence of unit root, we utilize both the augmented Dicker-Fuller (ADF) test and the Philip-Perron (PP) test. The null hypothesis is generally defined as the presence of a unit root and the alternative hypothesis is stationarity, trend stationary or explosive root depending on the test used.



Table 4.1: Summary statistics for unit root test

Variable	ADF Test		Philip-Perron Test	
	ADF statistics	Order of Integration	PP statistics	Order of Integration
NI	-4.961***	I(1)	-4.961***	I(1)
GOD	-5.416***	I(1)	-5.413***	I(1)
GOR	-8.219***	I(1)	-9.085***	I(1)
HEI	-5.392***	I(1)	-9.212***	I(1)
POPG	-31.485***	I(1)	-22.398***	I(1)
FIS	-5.436***	I(0)	-4.373***	I(0)
CPS	-4.159***	I(0)	15.256***	I(0)
INF	-4.959***	I(0)	-4.953***	I(0)
EXR	4.970 ***	I(1)	4.473 ***	I(1)
UEM	5.720 ***	I(1)	7.084 ***	I(1)
SAV	5.989 **	I(1)	6.182 ***	I(1)
PCI	5.349 ***	I(1)	9.734 ***	I(1)
UEM	6.923 ***	I(1)	5.907 ***	I(1)
TAX	4.598 **	I(1)	9.388 ***	I(1)
REM	5.082***	I(1)	5.077***	I(1)

Source: Researchers’ estimations. \*\*\*, \*\* and \* indicate statistical significance at 1%, 5% and 10% respectively.

The result shown on Table 4.1 indicates that all the variables are integrated of order one (I(1)) except FIS, CPS, and INF are integrated of order zero (I(0)). In line with Woodridge’s (2011) conclusion, the time series are realization of stochastic processes.

**(b) Cointegration Test**

Given that most of the time series are not integrated at levels (I(0)), we proceed to implement a cointegration test. According to Woodridge (2011), a cointegration test is used to establish if there is a correlation between several time series in the long term. We employed the Philp-Quliaris (PQ) technique in the test of cointegration. The null hypothesis of no cointegration is rejected if at least there is one cointegrating equation. This implies that there is the existence of long-run relationships among the various.

Table 4.2: Summary of PQ Cointegration Results

Dependent Variable	tau-statistic+	Prob.	Remarks++
NI	-3.141033	0.8912	
GOD	-4.896036	0.2243	
GOR	-14.68564***	0.0000	Cointegrated
HEI	-4.747591	0.2710	
POPG	-6.968996***	0.00313	Cointegrated
FIS	-6.128375***	0.0061	Cointegrated
CPS	-5.286606	0.1290	

Dependent Variable	tau-statistic+	Prob.	Remarks++
INF	-16.005409***	0.0000	Cointegrated
EXR	-58.902***	0.0000	Cointegrated
UEM	-62.07948***	0.0000	Cointegrated
SAV	-49.89773***	0.0000	Cointegrated
PCI	-52.90844***	0.0000	Cointegrated
UEM	-69.8972***	0.0000	Cointegrated
TAX	-48.9087***	0.0000	Cointegrated

Source: Researchers' estimations

\*, \*\* and \*\*\* indicate statistical significance at 10%, 5% and 1% respectively

+The tau-statistics follows MacKinnon procedure for nonparametric estimates. The probability values are derived from the MacKinnon response surface simulation results.

++ there are 11 cointegrated equations. At least one cointegrated equation is required to reject the null of no cointegration.

From the result shown on Table 4.2, there are eleven (11) cointegrating equations. Thus, the null hypothesis of no cointegration is rejected. Therefore, we conclude that there is a long-run relationship among the variables to be used in the long-run model of GHE, PHE and OHE.

**(c) Impact of Remittance on Health Spending**

To achieve the objectives of the study, three models (namely the general government health expenditure [GHE] model, private health expenditure [PHE] model, and the out-of-pocket health expenditure [OHE] model) were estimated. The three models of health spending were estimated using the canonical cointegrating regression (CCR) framework. The CCR was estimated with Bartlett kernel and Newey-West fixed bandwidth of 4.0. Using 84 quarterly observations, the model was estimated with the assumption of a quadratic trend.

Table 4.3: Summary of Longrun estimates of the impact of remittance on health spending

Variable	Model 1	Model 2	Model 3
	GHE	PHE	OHE
REM	0.048(0.038)	0.025(0.005)***	0.082(0.019)***
NI	0.0319(0.007)***		
GOD	-0.0162(0.008)**		
GOR	0.1443(0.052)***		
HEI	-0.1916(0.078)**		-0.054(0.017)***
POPG	0.0186(0.005)***		
FIS	0.083(0.054)		
PCI		0.053(0.012)***	0.376(0.122)***
CPS		0.294(0.85)	
INF		-0.022(0.006)***	

EXR		-0.026(0.008)***	
UEM		-0.047(0.007)***	-0.717(0.169)**
SAV			-0.118(0.072)
TAX			-0.032(0.011)***
C	-0.0745(0.015)***	0.042(0.005)***	0.127(0.177)
R-squared	0.817	0.782	0.689
Obs	84		

Source: Researchers’ estimations

The result obtained is shown in Table 4.3. The result shows that the coefficient of REM is 0.048, 0.025, and 0.082 for GEH, PHE and OHE models respectively. This suggests that a 1 unit increase in remittance will lead to 0.048 unit, 0.025 unit, and 0.082 unit increases in general government health spending (GEH), private health spending (PHE) and out-of-pocket health spending (OHE), respectively. Model one, also shows that the coefficients of government revenue (GOR) and population growth (POPG) are 0.144 and 0.0186 respectively. This suggests that increasing GOR and POPG by one unit will raise GHE by 0.144 units and 0.0186 units respectively. In the same vein, the coefficients of government debt (GOD) and health insurance scheme (HEI) are -0.016 and -0.192, suggesting that GHE will decrease by 0.016 units and 0.192 units if GOD and HEI are raised by one unit. Similarly, the model of private health spending (PHE) shows that per capita income (PCI) and credit to the private sector (CPS) are positively related to PHE, while inflation (INF), exchange rate (EXR) and unemployment (UEM) exert negative impacts on PHE. The coefficients are 0.053 (for PCI), 0.294 (for CPS), -0.022 (for INF), -0.026 (for EXR) and -0.047 (for UEM). In model three (OHE), health insurance (HEI), unemployment (UEM), savings (SAV), and taxation (TAX) are negatively related to OHE. The coefficients are -0.054, -0.717, -0.118 and -0.032 for health insurance (HEI), unemployment (UEM), savings (SAV), and taxation (TAX) respectively. However, PCI entered the model with a positive coefficient of 0.376.

**Evaluation of Estimates**

The estimates obtained from the three models estimated in this study were evaluated using the following post-estimation tests: R-square test, Wald test, serial correlation test and heteroskedasticity.

**(a) R-square Test**

The R<sup>2</sup> measures the goodness of fit of a regression model. As shown in Table 4.3, the R<sup>2</sup> for model 1 (GHE), model 2 (PHE) and model 3 (OHE) are 0.817, 0.782 and 0.689 respectively. This suggests that 82%, 78% and 69% of the variations in GHE, PHE and OHE respectively were explained by the explanatory variables. This is an indication that the model is a good fit.

**(b) Wald Test**

The joint significance of the regression model is evaluated using the multiple parameters Wald test. The Wald test is analogous to the F-test in the ordinary least square (OLS) regression framework. The test statistics are F-statistics and Chi-square statistics. If the p-value of both F-statistics and Chi-square statistics are less than 0.05, the null hypothesis will be rejected at a 95% confidence level. If the test fails to reject the null hypothesis, then we conclude that the regression model is not robust. The Wald test statistics are summarized in Table 4.4. The result shows that the F-statistics are 33.25, 46.02 and 18.43 respectively. Since both probabilities of F-statistics and Chi-square are less than 0.05 (0.0001 for F-statistics and 0.000 for Chi-square), we conclude that the model is jointly statistically significant.

Table 4.4: Summary Statistics for Wald Test

Test Statistic	GHE	PHE	OHE
F-statistic	33.25	46.02	18.43
(prob)	(0.000)	(0.000)	(0.000)
Chi-square	229.27	121.32	78.92
(prob)	(0.000)	(0.000)	(0.000)

Source: Researchers' estimations

**(c) Serial Correlation test and Heteroskedasticity test**

The robustness, appropriateness and predictive power of the estimated econometric model are evaluated based on the serial correlation LM test and heteroskedasticity test. The serial correlation Lagrangian Multiplier (LM) is an asymptotic test that investigates whether the classical regression assumption of no serial correlation is violated. In this study, we employed the Breusch-Godfrey serial correlation LM Test. As shown in Table 4.5 the null hypotheses of no serial correlation and no heteroscedasticity are not rejected for all the models. We therefore conclude that there is neither serial correlation nor heteroscedasticity in the estimated model.

Table 4.5: Summary Statistics for Serial Correlation test and Heteroskedasticity test

	Model 1 (GHE)	Model 2 (PHE)	Model 3 (OHE)
Serial Correlation Test: Hypothesis: $H_0$ : There is no serial correlation in the residual			
Breusch-Godfrey Serial Correlation LM Test	1.643 (0.221)	1.202 (0.710)	1.478 (0.582)
Heteroskedasticity Test: $H_0$ : The residual is homoscedastic			
Breusch-Pagan-Godfrey	1.924 (0.118)	0.192 (0.878)	1.882 (0.178)

Source: Researchers' estimations

**Discussion of Findings**

The findings of these results are mixed. While workers' remittance does not have a significant impact on government health spending, it has a significant impact on both private and out-of-pocket health spending. The finding that workers' remittances do not significantly impact government health spending is an intriguing result that can be situated within the existing literature on the relationship between remittances and public healthcare expenditure. While some studies suggest a positive correlation between remittances and government health spending (Awojobi, 2013), other research findings align with the result obtained in our study (Igbinedion & Mogbolu, 2023).

One possible explanation for this result could be that government budget allocations are influenced by various factors beyond remittances, such as overall economic conditions, healthcare priorities, political considerations, environmental sustainability considerations and competing budgetary demands (Dimnwobi et al., 2021, Dimnwobi et al, 2023a; Dimnwobi et al., 2023b). As argued by Igbinedion and Mogbolu (2023), governments may have predetermined budget allocations for health expenditures that are not directly influenced by remittance inflows. Additionally, remittances may be channelled towards other sectors or household consumption rather than directly impacting government healthcare budgets. Awojobi (2013), however, argued that the effectiveness of remittances in boosting government health spending may depend on the governance structure, efficiency of public financial management systems, and policy priorities in the receiving country.

The finding that workers' remittances have a significant positive impact on private health spending and out-of-pocket expenses aligns with Gupta and Chowdhury (2014), Ahmed, Mughal and Martinez-Zarzoso (2018), Adams and Cuecuecha (2010), Das, Kumar and Khan (2020) and Azizi (2021). According to Azizi (2021), remittance income contributes to increased private health spending by providing households with additional financial resources to afford better quality healthcare services, medications, and treatments. Remittances act as a financial cushion that enables families to meet healthcare needs that may not be covered by insurance or public health programs (Mughal & Martinez-Zarzoso, 2018; Das et al, 2020). This leads to improved access to healthcare services, higher utilization rates, and better health outcomes for individuals and families receiving remittances. Furthermore, Gupta and Chowdhury (2014) explain that a positive impact on out-of-pocket health spending can be attributed to the direct use of remittance funds to cover medical expenses not covered by insurance or other forms of financial support. Households receiving remittances may rely on this income to meet healthcare costs, reducing the financial burden of out-of-pocket spending and enhancing their ability to access necessary medical care.

## CONCLUSION AND POLICY INSIGHTS

### Conclusion

Health expenditure is essential for achieving the Sustainable Development Goals (SDGs) by providing resources to address health challenges such as universal health coverage, reducing maternal and child mortality, and combating diseases. Despite Nigeria's commitment to global health treaties advocating increased healthcare spending, its health expenditure as a share of GDP remains significantly below international benchmarks and lags behind its counterparts in Africa. This discrepancy underscores the pressing need for increased investment in Nigeria's healthcare system to improve access, quality, and outcomes for its population. Investment in healthcare is fundamental for ensuring equitable access to high-quality medical services. Remittances, funds sent by migrants to their home countries, play a vital role in bolstering healthcare expenditure, thereby enhancing healthcare infrastructure, services, and resources. This influx of funds can notably ameliorate healthcare accessibility and outcomes in recipient nations, particularly in developing regions where healthcare funding may be constrained. Through the application of Canonical Cointegrating Regression (CCR) analysis, the study revealed that while remittances do not exert a significant influence on government health expenditure, they do have a considerable positive impact on private health expenditure and out-of-pocket health spending.

### Policy Implications

Based on the study's findings regarding the impact of remittances on healthcare expenditure, here are some policy recommendations:

**Encourage Investment in Private Healthcare Infrastructure:** Recognizing the significant positive impact

of remittances on private health expenditure, policymakers should encourage investment in private healthcare infrastructure. This could involve creating incentives for private healthcare providers to expand their services, improve facilities, and enhance the quality of care.

**Facilitate Access to Healthcare Services:** Given the positive influence of remittances on out-of-pocket health expenditures, policymakers should focus on initiatives that facilitate access to healthcare services for all segments of the population. This could include implementing subsidies or vouchers for healthcare expenses, particularly for low-income individuals who may rely heavily on out-of-pocket spending.

**Promote Financial Inclusion:** To maximize the benefits of remittances on healthcare expenditure, efforts should be made to promote financial inclusion among recipients. This can involve initiatives such as expanding access to banking services, promoting digital payment systems, and providing financial education to ensure that remittance funds are effectively utilized for healthcare purposes.

**Enhance Public-Private Partnerships:** Given the limited impact of remittances on general government health expenditure, policymakers should explore opportunities to enhance public-private partnerships in the healthcare sector. Collaborative efforts between the government and private healthcare providers can help leverage remittance funds more effectively to improve overall healthcare access and quality.

### Limitations of the study

The limitations of this study are as follows. First, the narrow geographical focus solely on Nigeria restricts the generalizability of the findings to broader African economies or other developing regions facing similar issues. Expanding the scope of the study to encompass Sub-Saharan Africa would enhance the relevance and applicability of the results across the continent. Additionally, future studies could explore various global locations with comparable economic and healthcare challenges to help universalize these findings and offer a broader perspective. Secondly, the study employs a linear regression approach to assess the relationship between the research variables. While this method provides valuable insights, different outcomes might emerge when using nonlinear data analysis methods. Incorporating nonlinear models or other advanced statistical techniques in future research could offer a more nuanced understanding of the relationships and potentially uncover complex dynamics that linear models may not capture. Thirdly, the current study focuses primarily on the direct relationship between remittances and health expenditure. Future research could extend investigations to assess the influence of additional factors such as governance quality, environmental quality, and access to electricity. These factors can significantly impact health spending and outcomes and including them in the analysis would provide a more comprehensive view of the determinants of health expenditure. Such insights could be invaluable for policymakers aiming to improve healthcare systems and achieve elevated levels of health outcomes. Despite these limitations, the study successfully met its intended objectives. It provides a detailed analysis of the impact of remittances on health expenditure in Nigeria, offering important insights into the nuances of healthcare funding allocation. This study lays the groundwork for future investigations and policy development aimed at improving healthcare access, quality, and outcomes.

### REFERENCES

1. Adams, R. H., & Cuecuecha, A. (2010). Remittances, household expenditure and investment in Guatemala. *World Development*, 38(11), 1626-1641. <https://doi.org/10.1016/j.worlddev.2010.03.003>
2. Ahmed, J., Mughal, M., & Martinez-Zarzoso, I. (2018). They earn and send; we spend: Consumption patterns of Pakistani migrant households. *International Journal of Social Economics*, 45(7), 1092-1108. <https://doi.org/10.1108/IJSE-01-2017-0029>
3. Ayipe, F. I., & Tanko, M. (2022). Public health expenditure and under-five mortality in low-income

- Sub-Saharan African countries. *Social Sciences & Humanities Open*, 8(1), 100570. <https://doi.org/10.1016/j.ssaho.2023.100570>
4. Ajefu, J. B., & Ogebe, J. O. (2021). The effects of international remittances on expenditure patterns of the left-behind households in Sub-Saharan Africa. *Review of Development Economics*, 25(1), 405-429. <https://doi.org/10.1111/rode.12721>
  5. Awojobi, O. N. (2013). Impact of remittances on healthcare utilisation and expenditure in developing countries: A systematic review. *Rwanda Journal of Medicine and Health Sciences*, 2(3), 304-309. <https://dx.doi.org/10.4314/rjmhs.v2i3.15>
  6. Awoyemi, B.O., Makanju, A.A., Mpapalika, J., & Ekpeyo, R.S. (2023). A time series analysis of government expenditure and health outcomes in Nigeria. *Journal of Public Health in Africa*, 14(7), 1409-135
  7. Azizi, S. (2021). The impacts of workers' remittances on poverty and inequality in developing countries. *Empirical Economics*, 60, 969–991. <https://doi.org/10.1007/s00181-019-01764-8>
  8. Azolibe, C.B., Dimnwobi, S.K., & Uzochukwu-Obi, C.P. (2022). The determinants of unemployment rate in developing economies: does banking system credit matter? *Journal of Economic and Administrative Sciences*. <https://doi.org/10.1108/JEAS-01-2022-0021>
  9. Bailey, B (2022). Remittances head for 3-year high on CBN incentive, 'japa'. <https://businessday.ng/business-economy/article/remittances-head-for-3-year-high-on-cbn-incentive-japa/>
  10. Berloff, G., & Giunti, S. (2019). Remittances and healthcare expenditure: Human capital investment or responses to shocks? Evidence from Peru. *Review of Development Economics*, 23(4), 1540-1561. <https://doi.org/10.1111/rode.12599>
  11. Cheema, A.R., & Nadeem, M.Y. (2022). The impacts of foreign remittances on health expenditures in Pakistan. *Competitive Social Sciences Research Journal (CSSRJ)*, 3 (1), 95-105.
  12. Chezum, B., Bansak, C. & Giri, A. (2018). Are remittances good for your health? Remittances and Nepal's national healthcare policy. *Eastern Economic Journal*, 44, 594-615. <https://doi.org/10.1057/s41302-018-0106-9>
  13. Cooper, B., & Esser, A. (2019). Exploring barriers to remittances in sub-Saharan Africa series, Volume 6: Remittances in Nigeria. <https://cenfri.org/wp?content/uploads/2018/11/Barriers-to-remittances-in-SSA-vol-6-Nigeria.pdf>
  14. Dai, B., Amarteifio, E. N. A., Kyere, F., & Kwasi Sampene, A. (2024). Examining the dynamics between economic development, tourism, renewable energy and life expectancy in the Nordic economies. *Environmental Research*, 252, 118900. <https://doi.org/10.1016/j.envres.2024.118900>
  15. Das, M., Kumar, K., & Khan, J. (2020). Does remittance protect the household from catastrophic health expenditure in India. *International Journal of Migration, Health and Social Care*, 16(4), 481-493. <https://doi.org/10.1108/IJMHS-03-2020-0023>
  16. Dimnwobi, S.K., Ekesiobi, C., Madichie, C.V., & Asongu, S.A. (2021). Population dynamics and environmental quality in Africa. *Science of the Total Environment*, 797, 149172. <https://doi.org/10.1016/j.scitotenv.2021.149172>
  17. Dimnwobi, S. K., Okere, K. I., Onuoha, F. C., & Ekesiobi, C. (2022a). Energy poverty, environmental degradation and agricultural productivity in Sub-Saharan Africa. *International Journal of Sustainable Development & World Ecology*, 30(4), 428-444. <https://doi.org/10.1080/13504509.2022.2158957>
  18. Dimnwobi, S.K., Madichie, C.V., Ekesiobi, C., & Asongu, S.A. (2022b). Financial development and renewable energy consumption in Nigeria. *Renewable Energy*, 192, 668-677. <https://doi.org/10.1016/j.renene.2022.04.150>
  19. Dimnwobi, S.K., Okere, K.I., Onuoha, F.C., Uzochina, B.I., Ekesiobi, C. & Nwokoye, E.S. (2023a). Energizing environmental sustainability in Sub-Saharan Africa: the role of governance quality in mitigating the environmental impact of energy poverty. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-023-29541-2>

20. Dimnwobi, S.K., Okere, K.I., Azolibe, C.B. & Onyenwife, K.C (2023b). Towards a green future for Sub-Saharan Africa: do electricity access and public debt drive environmental progress? *Environmental Science and Pollution Research*, 94960-94975. <https://doi.org/10.1007/s11356-023-29058-8>
21. Dimnwobi, S.K., Onuoha, F.C., Uzochina, B.I., Ekesiobi, C.S. & Nwokoye, E.S. (2023c). Does public capital expenditure reduce energy poverty? Evidence from Nigeria. *International Journal of Energy Sector Management*, 17(4), 717-738. <https://doi.org/10.1108/IJESM-03-2022-0008>
22. Drabo, A., & Ebeke, C. (2010). Remittances, public health spending and foreign aid in the access to health care services in developing countries. Working Papers 201004, CERDI.
23. Ekesiobi, C., & Dimnwobi, S.K. (2020). Economic assessment of the Igbo entrepreneurship model for entrepreneurial development in Nigeria: evidence from clusters in Anambra state. *International Journal of Entrepreneurial Behavior & Research*, 27(2), 416-433. <https://doi.org/10.1108/IJEBR-11-2019-0640>
24. Ezenekwe, U. R., Okere, K. I., Dimnwobi, S. K., & Ekesiobi, C. (2023). Balancing the scales: Does public debt and energy poverty mitigate or exacerbate ecological distortions in Nigeria? *International Social Science Journal*. <https://doi.org/10.1111/issj.12465>
25. Fidelis, M. (2017). 17 million Nigerians living abroad, says government. <https://guardian.ng/news/17-million-nigerians-living-abroad-says-government/>
26. Grossman, M. (2017). On the concept of health capital and the demand for health. In *Determinants of health: an economic perspective* (pp. 6-41). Columbia University Press.
27. Gupta, I., & Chowdhury, S. (2014). Correlates of out-of-pocket spending on health in Nepal: implications for policy. *WHO South-East Asia Journal of Public Health*, 3 (3-4), 238 – 246.
28. Igbinedion, S.O., & Mogbolu, F. (2023). Public health financing, remittances, and inclusive growth in resource-rich countries: Evidence from Nigeria and Mozambique. *Jurnal Ekonomi dan Studi Pembangunan*, 15(1), 1-15
29. Islam, M.M., Bidisha, S.H., Jahan, I., Hossain, M.B., Mahmood, T. (2021). Effects of remittances on health expenditure and treatment cost of international migrant households in Bangladesh. *Journal of Governance, Security & Development*, 1(2), 1-21
30. Kakhkharov, J., Ahunov, M., Parpiev, Z., & Wolfson, I. (2021). South-South Migration: Remittances of labour migrants and household expenditures in Uzbekistan. *International Migration*, 59(5), 38-58. <https://doi.org/10.1111/imig.12792>
31. Kalaj, E.H. (2015). A micro-level analysis of the effect of remittances on health expenditures: Evidence from Albania. *Mediterranean Journal of Social Sciences*, 6(1), 665-673
32. Kan, S. (2021). Is an ounce of remittance worth a pound of health? The case of Tajikistan. *International Migration Review*, 55(2), 347-381. <https://doi.org/10.1177/0197918320926891>
33. Kapri, K., & Jha, S. (2020). Impact of remittances on household health care expenditure: Evidence from the Nepal Living Standards Survey. *Review of Development Economics*, 24(3), 991-1008. <https://doi.org/10.1111/rode.12666>
34. Khan, M. (2024). The impact of migrant remittances on economic development: empirical evidence from the developing world. *Journal of Social and Economic Development*. <https://doi.org/10.1007/s40847-024-00329-5>
35. Nwokoye, E. S., Igbanugo, C. I., & Dimnwobi, S. K. (2020). International migrant remittances and labour force participation in Nigeria. *African Development Review*, 32(2), 125–137. <https://doi.org/10.1111/1467-8268.12421>
36. Nwokoye, E. S., Igbanugo, C. I., Ekesiobi, C. & Dimnwobi, S. K. (2022). Fiscal incentives and tax compliance behaviour in industrial clusters: a survey of clusters in South-east Nigeria. *Journal of African Business*. <https://doi.org/10.1080/15228916.2022.2031827>
37. Nwokoye, E. S., Dimnwobi, S. K., Onuoha, F. C., & Madichie, C. V. (2024). Does public debt matter for human capital development? Evidence from Nigeria. *Journal of Public Affairs*, 24(2), e2912. <https://doi.org/10.1002/pa.2912>



38. Okafor, S. N., Ekesiobi, C., Ifebi, O., Dimnwobi, S. K., & Asongu, S. A. (2022). Testing the triple deficit hypothesis for sub-Saharan Africa: Implications for the African Continental Free Trade Area. *African Development Review*, 34(1), 142-153. <https://doi.org/10.1111/1467-8268.12616>
39. Okere, K.I., Dimnwobi, S. K., Ekesiobi, C., & Onuoha, F. C. (2023a). Pollution, governance, and women's work: Examining African female labour force participation in the face of environmental pollution and governance quality puzzles. *Women's Studies International Forum*. <https://doi.org/10.1016/j.wsif.2023.102851>
40. Okere, K.I., Dimnwobi, S.K., Ekesiobi, C., & Onuoha, F.C. (2023b). Turning the tide on energy poverty in sub-Saharan Africa: Does public debt matter? *Energy*. <https://doi.org/10.1016/j.energy.2023.128365>
41. Okere, K.I., Dimnwobi, S.K., & Fasanya, I.O. (2024). Do fintech, natural resources and globalization matter during ecological crises? A step towards ecological sustainability. *Journal of Open Innovation: Technology, Market, and Complexity*. <https://doi.org/10.1016/j.joitmc.2024.100371>
42. Onuoha, F.C., Dimnwobi, S. K., Okere, K. I., & Ekesiobi, C. (2023a). Funding the green transition: Governance quality, public debt, and renewable energy consumption in Sub-Saharan Africa. *Utilities Policy*. <https://doi.org/10.1016/j.jup.2023.101574>
43. Onuoha, F.C., Dimnwobi, S. K., Okere, K. I., & Ekesiobi, C. (2023b). Sustainability burden or boost? examining the effect of public debt on renewable energy consumption in Sub-Saharan Africa. *Energy Sources, Part B: Economics, Planning, and Policy*, 18(1), 1-15. <https://doi.org/10.1080/15567249.2023.2214917>
44. Petreski, B., Tumanoska, D., Dávalos, J., & Petreski, M. (2018). New light on the remittances-poverty-health nexus in Macedonia. *International Migration*, 56(5), 26-41. <https://doi.org/10.1111/imig.12436>
45. PwC (2019). Strength from abroad. The economic power of Nigeria's diaspora. <https://www.pwc.com/ng/en/p/economic-power-of-nigerias-diaspora.pdf>
46. Raihan, S., Uddin, M., & Ahmmed, S. (2022). Impact of foreign remittances on the household spending behaviour in Bangladesh. *Migration and Development*, 11(3), 1104-1126. <https://doi.org/10.1080/21632324.2020.1870835>
47. Rous, J. J., & Hotchkiss, D. R. (2003). Estimation of the determinants of household health care expenditures in Nepal with controls for endogenous illness and provider choice. *Health Economics*, 12(6), 431-451.
48. Shoab, M. (2016). A micro-level analysis of the effect of remittances on health care expenditures: A case study of Pakistan. A thesis submitted to the Department of Health Economics, Pakistan Institute of Development Economics, Islamabad, Pakistan.
49. Treleaven, E. (2019). Migration and investments in the health of children left behind: the role of remittances in children's healthcare utilization in Cambodia. *Health Policy and Planning*, 34, 684-693
50. Valatheeswaran, C., & Khan, M.I. (2020). Remittances, health expenditure and demand for healthcare services. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781003109747-3/remittances-health-expenditure-demand-healthcare-services-valatheeswaran-imran-khan>
51. Wang, D., Hagedorn, A., & Chi, G. (2021). Remittances and household spending strategies: evidence from the Life in Kyrgyzstan Study, 2011-2013. *Journal of Ethnic and Migration Studies*, 47(13), 3015-3036
52. World Bank (2023). World development indicators. <https://databank.worldbank.org/source/world-development-indicators>
53. World Health Organization (2022). Current health expenditure (% of GDP). Global Health Expenditure Database 2022. <http://apps.who.int/nha/database>

## FOOTNOTES

[1] The preliminary version of this research was presented during the May 2024 edition of the Department of Economics seminar series at Chukwuemeka Odumegwu Ojukwu University. We extend our sincere appreciation to the entire faculty for their constructive feedback during the presentation, which greatly contributed to the refinement of this work