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Author Affiliation:

¹Department of Economics, University of Ilesa, Ilesa, Osun State, Nigeria. Email: adegbola_ojaratade@unilesa.edu.ng
²Department of Economics, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria. Email: adeleye.oloniluyi@eksu.edu.ng
³Department of Economics, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria. Email: dayo.olanipekun@eksu.edu.ng

*Corresponding author:

Ojarotade Adegbola,
Department of Economics, University of Ilesa, Ilesa, Osun State, Nigeria. Email: adegbola_ojaratade@unilesa.edu.ng

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Health-workers' emigration and child health in Latin American and Caribbean countries

Ojarotade Adegbola^{1*}, Oloniluyi Adeleye Ebenezer²,
Olanipekun Dayo Benedict³

ABSTRACT

Background/Purpose: This research examines the influence that health workers' emigration from Latin American and Caribbean countries (LACCs) to rich-income countries has on child health in LACCs. **Methods:** This work utilized the quantile regression estimation technique to analyze panel data between 1990 and 2021. **Findings:** Higher Number of Health Workers that emigrated LACCs' (NHWE) from the empirical analysis of the two out of the three quantile results (1.568 and 2.812) were statistically detrimental to LACCs' child health (development) at 1%. Gross Domestic Product Per Capita (GDPPC), and the DGGHE displayed negative results with CMR; two of the GDPPC results are statistically significant at 1%, while two of the DGGHE results are at 10% and 1%. The PDPC and GE displayed positive and negative results and only one negative result of the GE is statistically significant at 10%, while none of the PDPC is. **Originality:** Its genuineness stems from the new variables employed and the findings.

Keywords: Emigration, child health, health workers, and Latin American and Caribbean countries.

1. INTRODUCTION

The international exodus and movement of professional health workers is rising in size and expanding in its complications. Internationally, health systems are today confronted with managing both in- and out-flows of health workers. Migrant health workers – moving perpetually or momentarily – buttress effective reciprocation to health crises and the attainment of Universal Health Coverage (UHC). Simultaneously, intensifying global health worker migration pressurizes health exigency response and the attainment of UHC in diverse countries (World Health Organization (WHO, 2026a). Furthermore, international health worker exodus to other country or continent is a well-established and increasing occurrence which is driven by essential labour market forces. This is associated with various elements like education, working conditions and remuneration across countries, and which has additionally heightened during the COVID-19 pandemic. While considerable exodus and movement also happen among countries in the same geographical area or surrounding, hiking global talent acquisition from low-and middle-income countries to meet local paucities in well-paid countries can worsen inadequacies in the

erstwhile. If not sufficiently planned, global mobility and migration of health workers from countries confronting health worker paucities can incapacitate their health systems and broaden unfairness (WHO, 2026b).

In Latin American and the Caribbean countries (LACCs), health systems confront rising pressures from constituents. Instances of these rising pressures include migration, tourism, and paucities of vanguard workers, and also increasing temperatures and natural misadventures hike the likelihood of waterborne and vector-borne diseases (Fundsforngos, 2026). The exodus of physicians, nurses, and other health professionals is brutally affecting low-and middle-income countries, especially in Central America and the Caribbean. The COVID-19 pandemic worsened this situation, uncovering essential lacunas in staffing gaps, particularly in agrarian and marginalized or disadvantaged districts. It is estimated that by 2030, Latin America and the Caribbean countries will confront a paucity of between 600,000 and 2 million skilled health workers (Pan American Health Organization, 2025). In the same vein, Cleverson et al., (2024) stress that rich-income countries have hiked their demand for professional health care workers at a rate that outruns their size of training and retaining. Hence, lacking an adequate labor force to meet their demands and, thus, resulting into growing dependence on overseas-trained health care workers.

Pan American Health Organization (2025) emphasizes that the rising migration of health professionals imposes extra stress on health systems, exacerbating structural lacunas and harsh working situations, corroborating this, Cleverson et al., (2024) also affirmed that there is rising worry that this occurrence is giving rise to a dearth of workforce in low- and middle-income countries (LMICs), incapacitating their health systems and broadening disproportions in health care.

Statistically, Organization for Economic, Cooperation and Development (OECD, 2023) reported the average number of health workers available per people in Latin American countries thus; two physicians per 1,000 people in most of the countries while it was only in Cuba, Uruguay, Trinidad and Tobago, and Argentina that were above the OECD average of 3.5 physicians per 1,000 people, 3.6 nurses per 1,000 people, 4.2 dentists per 10,000 people, 3.4 pharmacists per 10,000 people; 4.4 community health workers per 10,000 people. Most of these levels were below the acceptable statistics in OECD countries.

Pan American Health Organization (2024) reported that the number of deaths of children under the age of five got to reduced levels in 2022 universally. In the Latin American and Caribbean region, under-five deaths were approximated at 152,000 in 2022, indicating a 60 percent cut since 2000. These results, of huge importance, are the outcome of various steps evolved. Still, simultaneously they entail an essential impediment to encourage and intensify these outcomes and to progress towards the attainment of what still needs to be achieved. Notwithstanding, decreases, the yearly number of deaths among children, adolescents, and young people remains huge, especially in some population groups. There are various endangers and essential disproportions in existence which are classified according to place of birth, socio-economic group or particular environments that imply diverse situations of vulnerability (e.g. conflict, migration, among others) in the continent. In Latin American and the Caribbean countries, 57% of approximated under-five deaths are gathered in the first 28 days of life, while globally this number is 47%. The main sources of death include prematurity, asphyxia, sepsis/infection, and congenital anomalies.

Statistically, according to Our World in Data (2026), the child deaths in Latin America and Caribbean region as at 1990 stood at 646,941, in 1995 it was 505,971, in 2000 it was 380,000, in 2005 it was 285,304, in 2010 it stood at 244,751, in 2015 it was 194,124, in 2020 stood at 164,824, while in 2023 it was 148,653.

Amm (2020) stressed that the low number of medical workers to people in Latin American and Caribbean countries, and other developing countries resulted because of failure of wealthy countries to educate sufficient number of their own health workers to provide services in the local health systems results into their dependence and recruitment of huge numbers of health workers from low-and middle-income countries (LMICs), adding to the harsh health workforce paucities in the sending countries.

It is crystally clear that health workers emigration in the Latin American and Caribbean continent had taken its toll on child health based on the pieces of information provided above. Pan American Health Organization (2025) emphasized that reversing the trend requires strengthening human resources for health policies, and looking for concerted panaceas between source countries, and receiving countries. Since trained and evenly shared health workers are the bedrock for productive and feasible health systems (Joshi et al., 2023), it is, therefore, imperative for researchers to examine cursorily and diligently the association between health workers' emigration in Latin American and Caribbean countries, and its effect on child health.

Scope of the study

Cross-sectional panel dataset was utilized in this study, and it covered period between 1990 and 202. It includes 10 developing countries of Latin American and Caribbean that are Brazil, Barbados, Colombia, Dominican, Jamaica, Trinidad & Tobago, Guyana, Saint Lucia, Grenada, and St. Vincent. Data availability was the criterium used to select the countries in this study.

2. REVIEW METHODS

Theoretical framework

The Neo-classical theory of migration propounded by Todaro (1969), and reviewed by Harris and Todaro (1970) is the theoretical framework employed in this study. It emphasizes that global exodus happens due to dissimilarities in wage levels between nations and employment markets. It emphasizes further that healthcare workforce moves from places with small global wage (push factor) to nations with exceptionally lofty wage (pull factor). This results due to wage differential between countries of the world. Furthermore, the theory highlights that remittances from diasporans serve as means of penury cut, and improvements of their economies in a situation where emigrants transmit remittances to their countries of origin (sending countries). In the opposite, this type of migration to distant nations could hinder the development and growth, in a situation where the countries of origin pass over relatively experienced workers to accepting countries such that human capital passes over can inversely affect the growth and development of the economy of the source nation.

Empirical Review of Literature

Empirical scholarly studies from cross-country studies in other regions, cross-country studies in Latin American and Caribbean countries, and country-specific studies on how health workers' emigration influences child health are carefully reviewed below:

Cross-country studies from other regions

Amm (2020) investigated the effect of medical brain-drain on child health within the time-frame of 2000 and 2015. He used the panel dataset of 188 countries that included Latin American countries employing fixed effect regression model. The finding revealed that medical brain-drain inversely affected the child health in those countries. Similarly, Chauvet et al., (2013) conducted research focusing on the effects of aid, remittances and medical brain-drain on child health employing panel and cross-country quintile-level data on respectively 84 and 46 developing countries. The finding revealed that medical brain-drain increases child mortality in these selected countries. Bhargava et al., (2011) scrutinized the effects of physicians in the sending countries, and abroad on child mortality and vaccination rates from 1991 to 2004 with the use of random and fixed effects models. The finding revealed that physicians' emigration had negative association with child mortality.

Cross-country studies in Latin American and the Caribbean

Imaidon (2018) examined the association between medical brain-drain and health outcomes in 18 Latin American developing countries. He used panel dataset between 1991 to 2004 and also with the use of fixed-effects panel regression model and instrumental variable approach under two-stage least squares. The finding revealed that increase in number of child deaths resulted as a result of medical brain-drain.

Country-specific studies

Mahama et al., (2025) examined the impact of brain drains among nurses on quality care delivery at Tamale Teaching Hospital, Ghana, employing a structured questionnaire adopted from a past study employing a sampling technique to select participants based on their accessibility and willingness, using descriptive statistics. The finding indicated increased in mortality (child deaths inclusive).

The assessment of the available studies in the foregoing extracts uncovers that wealthy countries have adequate resources to sign up oversea-trained health workers, it is reverse for the developing and less-developed countries and it is terrible due because the health workers' emigration level in LACCs are undisputedly great and simultaneously, they are in dearth of resources to augment the paucities in their health labour-force. From this framework, it can be affirmed that the association between health workers' emigration and health is not direct; rather, it can be quadrate, with tougher effects of health workers' emigration among LACCs roughly in the midst of the health workers' emigration scale, and indisposed influences on both extremes. Also, the effect that health workers' emigration from Latin American and Caribbean countries to other continents has on child health in the sending continent has not been largely investigated, this provides another justification for this study. This study, therefore, examines the association between health workers' emigration and child health using empirical evidence from LAC countries.

Model Specification

In order to examine the effect of health workers’ emigration on child health in LACCs, Imaidon (2018) econometric model hypothesized, modified, and adopted for this study. The Imaidon (2018) econometric model is as follows:

$$\ln\text{ChildMor}_{i,t} = f(\text{MBD}, \ln\text{GDPPC}_{i,t}, \ln\text{Child HIV}_{i,t}, \text{Water}_{i,t}, \text{Physician per 1000}_{i,t}) \dots\dots\dots 1$$

The above equation is modified by expunging *InChildMor*, *MBD*, *lnChild HIV*, *water*, and *Physician per 1000*, in contrast Child Mortality Rate (Proxy for Child health), Number of Health workers that emigrated LACCs, Physicians density Per Capita, Domestic General Government Health Expenditure, and Government Effectiveness were included.

$$\text{Child Mortality Rate} = f(\text{Number of Health workers that emigrated LAC}, \text{GDP Per Capita}, \text{Domestic General Government Health Expenditure}, \text{Physicians Density Per Capita}, \text{and Government Effectiveness}) \dots\dots\dots 2$$

Econometrically,

$$\text{CMR}_{it} = \alpha_0 + \alpha_1 \ln\text{NHWE}_{it} + \alpha_2 \ln\text{GDPPC}_{it} + \alpha_3 \text{DGGHE}_{it} + \alpha_4 \text{PDPC}_{it} + \alpha_5 \text{GE}_{it} + \varepsilon_{it} \dots\dots\dots 3$$

The dependent variable employed in this study is Child Mortality Rate (*CMR*), while independent variables are log of Number of Health Workers that emigrated LACCs (primary variable of interest), log of Gross Domestic Product Per Capita (*lnGDPPC*), Domestic General Government Health Expenditure, Physicians Density Per Capita (*PDPC*), and Government Effectiveness (*GE*) in equation (3). In equation 3, α_0 is an intercept, α_1 , a parameter of primary interest, is expected to be positive, the higher the *NHWE*, the higher the *CMR*, and vice versa, in contrast $\alpha_2, \alpha_3, \alpha_4$, and α_5 are to have negative relationships with *CMR*, the higher the control variables, the lower the *CMR*. ε signifies the error term, $t = 1 \dots T$ denotes time, while $i = 1 \dots N$ stands for number of country.

Estimated Techniques

Quantile regression analysis was employed to investigate the model in this study. The justification for the use of this estimation technique stems from its ability to investigate the impact of variables on various points of the distribution like the median, or lower and upper quantile. It also provides tailored insights for various parts of a population.

Data and Measurement of Variables

Delving into the examination of the effect of health workers’ emigration on child health in LACCs requires justifications for the chosen variables. Child Mortality Rate (*CMR*) or Under-5 mortality rate was chosen as the dependent variable. The selection of *CMR* is justified because it evaluates the exposure of children to different health risks, which is essential for comprehending the health conditions of a population (Amm, 2020). It also evaluates the children’s access to healthcare, which is essential to health outcomes. The choice of *NHWE* is postulated on its tendency to disrupt the stability of the healthcare system, which can lead to its collapse. The justification for *GDPPC* is based on its capability to provide a normalized barometer of economic output per person, which is critical for global analogy and decision-making. The choice of *DGGHE* is based on the government’s preparedness to invest in human capital development and health facilities, and also the well-being of its people, thereby paving the way to link health expenditures to health outcomes. The choice of *PDPC* is informed because it is a critical clue of healthcare accessibility, which shows the availability of skilled medical workers to meet the healthcare need of a nation. Finally, *GE* is justified because it is an important gauge for measuring the delivery of public services efficiently or effectively. The data of child mortality rate, gross domestic product per capita, domestic general government health expenditure, and physicians’ density per capita sourced from World Development Indicators 2025, government effectiveness from World Governance Indicators 2023, while number of health workers that emigrated LACCs to England sourced from Commons Library Research Briefing, November 2025.

Child Mortality Rate (CMR) or Under-5 Mortality Rate: This is the likelihood per 1,000 that a newborn baby will die before attaining age five, if subject to age-specific mortality rates of a specified year. It measures the mortality rate of under-5 per 1,000 live-births.

The Number of Health Workers that Emigrated: This refers to the total number of all Latinos and Caribbean health workers who satisfied desire to emigrate from the LACCs to other continents, which is premised on push and pull factors. It measures the stock of professional health workers who relocated overseas.

Gross Domestic Product Per Capita: It is gross domestic product divided by the half-year population. Gross Domestic Product gives the summed-up income earned through the creation of goods and services within an economic boundary during an accounting period. The core indicator (*GDP*) is divided by the general population to achieve a per capita amount. Data are in the current local currency. It measures it in constant 2015 US\$.

Domestic General Government Health Expenditure: This is public health expenditure from national sources as a percentage of the yearly summed-up public expenditure. It reveals the priority of government to spend on health sector from its own domestically sourced public available financial resources. It is measured as a percentage of general government expenditure.

Physicians' Density Per Capita: It is the stock of physicians (doctors) per specified number of people in relation to the population, typically expressed as per 1,000 or 10,000. It is a gauge deployed to measure the availability of doctors relative to the population size, regularly used to assess healthcare access and resource allocation. It measures the availability of health-workers in a country per 1,000 or 10,000 patients in a country.

Government Effectiveness: Reflects perceptions of the quality of public services, and the degree of its independence from political pressures. Its estimate ranges between -2.5 (weak) to 2.5 (strong) governance performance.

3. RESULTS & DISCUSSION

Table 1 gives the clear descriptive statistics of the variables employed in this study. The mean probability of child mortality is 20.97 per thousand live-births, while the maximum deaths result is 46.5 per 1,000 live-births, and the minimum deaths result is 10 per 1,000 live-births. The mean value of number NHWE is 25, the maximum value is 186 and, the minimum value is 2. *GDPPC* gives a mean value of \$9438, and its maximum value is \$23101, and the minimum value is \$3759.6. An The mean value of *DGGHE* is \$9.3, with a maximum value of \$19, and its minimum value is 0.00. *PDPC* has an estimated mean value of 0.49, and a maximum of 4.10, and a minimum value of 0.00. Finally, *GE* has a mean value of 0.2, and a maximum value of 1.56, and a minimum value of -0.59.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	CV	Max	Min
CMR	20.965	7.282	0.347	46.500	10.000
NHWE	25.225	32.414	1.285	186.000	2.000
GDPPC	9438.142	4833.254	0.512	23101.350	3759.608
DGGHE	9.333	3.470	0.372	19.083	0.000
PDPC	0.497	0.828	1.666	4.108	0.000
GE	0.238	0.456	1.919	1.563	-0.588

Source: Researcher's Computation (2025-2026).

Table 2 reveals the correlation coefficients results, which clearly show that the number of health workers that emigrated (*NHWE*) LACCs was directly related to child mortality rate (*CMR*). Contrarily, *GDPPC*, *DGGHE*, *PDPC*, and *GE* were inversely related to child mortality rate (*CMR*) by 3.1 percent, 2.1 percent, 11.8 percent, and 33.6 percent. It implies that *NHWE* strongly influenced *CMR* by 4.1% respectively between 1990 and 2021. Thus, having dissected the relationships of employed independent variables and *CMR* in LACCs, it is essential to find out the stationarity order of the panel series to establish the satisfactory employment of econometric techniques by the model.

Table 2. Pairwise correlation coefficients

Variable						
CMR	1					
NHWE	0.041	1				
GDPPC	-0.312	-0.181	1			
DGGHE	-0.214	-0.038	-0.151	1		
PDPC	-0.118	-0.080	0.069	0.379	1	
GE	-0.336	-0.127	0.482	0.013	-0.146	1

Source: Researcher's Computation (2025-2026).

Table 3 presents the results of the panel unit root test, which are employed to determine whether the variables are stationary or contain a unit root- an important step before conducting future econometrics analysis to avoid spurious regression results. The table reports test statistics for two commonly used unit root tests: the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. Each test is applied both to the level form of the variable and to its first difference, indicated by “D” preceding the variable name. The asterisks denote statistical significance at the 1%, 5%, and 10% levels, thereby allowing the researcher to assess whether the null hypothesis (non-stationarity) can be rejected. Regarding the variable *CMR*, the ADF test statistic at the level is 43.672, and is statistically significant at the 1% level. This indicates that the variable is stationary in its level form. This finding corroborates the PP test at the level, which yields a statistic of 31.719, significant at 5% level. Both tests confirm that *CMR* does not have a unit root and is stationary, this means that it does not require differencing for reliable analysis. In contrast, the variables (*lnNHWE*), (*lnGDPPC*), and *DGGHE* appear non-stationary in their level forms, thus require further differencing. For (*lnNHWE*), the ADF test statistic at level is 45.785, and the PP test is 45.897, both statistically insignificant, this means that the null hypothesis of a unit root cannot be rejected. However, examination of the first difference of (*lnNHWE*) shows that the ADF test statistic jumps to 89.466, significant at the 1% level, and the PP test similarly becomes highly significant at 90.445. This pattern indicates that (*lnNHWE*) becomes stationary after first differencing, classifying it as integrated of order one, (1). The same pattern holds for (*lnGDPPC*), and *DGGHE*; both are non-stationary at the level but achieve stationarity at the 1% significance level after differencing, as confirmed by both the ADF and PP tests. These results suggest that these variables are trended and require differencing to achieve stationarity.

The variable *PDPC* exhibits strong evidence of stationarity even at the level. The ADF test statistic at level is 95.065, significant at the 1% level., and the PP test at the level is even more pronounced at 91.995, also significant at 1% level. The first differenced results are even larger, but the level results alone confirm that *PDPC* is stationary. Similarly, *GE* shows mixed evidence at the level: the ADF test is 36.619, significant at the 5% level, while the PP test is 45.700, also significant at 1% level. Both tests strongly reject the unit root hypothesis at the 1% level for the first difference, but the level results already suggest stationarity, particularly under the PP test. This implies that *GE* may be trend stationary or weakly dependent in the levels.

Overall, the panel unit root tests reveal a mix of stationary and non-stationary variables. *CMR*, *PDPC*, and *GE* appear stationary in levels, while *lnNHWE*, *lnGDPPC*, and *DGGHE* are non-stationary in the levels but become stationary after first differencing. These findings are crucial for guiding the appropriate specification of econometric models, so as to ensure that variables are integrated of the same order before the panel regression technique is applied.

Table 3. Panel unit root test results

Variable	ADF	D.ADF	PP	D PP
CMR	43.672***	79.424***	31.719**	72.160***
NHWE	45.785	89.466***	45.897	90.445***
ln(GDPPC)	24.990	74.355***	11.832	90.826***
DGGHE	27.491	40.812***	7.838	48.912***
PDPC	95.065***	240.021***	91.995***	1133.9***
GE	36.619**	227.631***	45.700***	501.09***

Note: *** p < 1%, ** p < 5%, * p < 10%.

Source: Researcher’s Computation (2025-2026).

Contained in Table 4 are 25% (lower), 50% (median), and 75% (upper) of the quantile regression results of the effects of all the independent variables employed on *CMR* in LACCs. A careful look at the results shows that *NHWE* displays 0.369 which is not statistically significant under 25% (lower) while it displays 1.568, and 2.812 which are statistically significant at 1% level under 50% (median) and 75% (upper). 25% (lower) result indicates that 1% increase in *NHWE* increases *CMR* by 0.37 in the selected countries of LACCs, but it is not significant. 50% (median), and 75% (upper) results indicate that 1% increase in *NHWE* increases *CMR* by 1.6, and 2.8 and are statistically significant. These results evidence that higher number of health workers emigration is associated with higher child mortality rate in the selected countries of LACCs. This increase in *CMR* which results from higher *NHWE* is detrimental to child health in the selected LAC countries.

Contrarily, *lnGDPPC* displays -3.452, -0.547, and -7.026 under 25% (lower), 50% (median), and 75% (upper). The results of 25% (lower), and 75% (upper) are statistically significant, but 50% (median) result is not statistically significant. A percent increase in

lnGDPPC decreases *CMR* by 3.5, and 7 under 25% (lower), and 75% (upper) at 1%, and are also statistically significant, while it also decreases *CMR* by 0.55 under 50% (median), but it is not statistically significant. These results show that higher *GDPPC* in the selected countries of LAC has a favourable effect on *CMR*. It is expected that as *GDPPC* rises, investment in child health is expected to rise, and this is expected to reduce *CMR*. This shows the beneficial importance of gross domestic product per capita in the country. A percent increase in *DGGHE* decreases *CMR* by 0.22 and 1.39 under 25% (lower), and 75% (upper) at 10% and 1%, and are statistically significant, while it also decreases *CMR* by 0.13 under 50% (median), but it is not statistically significant. This may arise because of government heavy investments in healthcare infrastructural facilities in these selected countries, health education, favourable working conditions, and good emoluments packages for health workers and other incentives.

A percent increase in *PDPC* increases *CMR* by 0.34 under 25% (lower), contrarily a percent increase in *PDPC* under 50% (median), and 75% (upper) decreases *CMR* by 0.07 and 0.045, but none of the three results is statistically significant. An increase in *CMR* despite an increase in *PDPC* could be as a result of inefficiency of the health workers or because of the unavailability of required health infrastructural facilities, while a decrease in *CMR* as a result of an increase in *PDPC* could be as a result of non-emigration of health workers coupled with conducive working conditions for the health workers and others. A percent increase in *GE* increases *CMR* by 0.27 under 25% (lower), but it is not statistically significant, while it reduces *CMR* by 2.56 and 3.06 under 50% (median), and 75% (upper) but statistically significant at 10% under 50% (median). The increase in *CMR*, though not significant, could have been a result of inefficiency of governmental agencies responsible for overseeing the health institutions among the selected countries, while the reduction in the *CMR* could have resulted from the effectiveness of governmental agencies among these selected countries of LAC.

Table 4. Quantile regression estimates for the Child Mortality Rate model

Independent variable	Dependent variable: <i>CMR</i>		
	25% (Lower)	50% (Median)	75% (Upper)
<i>lnNHWE</i>	0.369 (0.325)	1.568*** (0.508)	2.812*** (0.864)
<i>lnGDPPC</i>	-3.452*** (0.945)	-0.547 (1.477)	-7.026*** (2.512)
<i>DGGHE</i>	-0.212* (0.113)	-0.130 (0.176)	-1.395*** (0.299)
<i>PDPC</i>	0.338 (0.433)	-0.070 (0.676)	-0.045 (1.150)
<i>GE</i>	0.272 (0.902)	-2.562* (1.409)	-3.069 (2.397)
Intercept	465.6*** (98.26)	874.5*** (153.5)	378.0 (261.1)
Country Fixed-Effect	Yes	Yes	Yes
Time Fixed-Effect	Yes	Yes	Yes
Observation	240	240	240

Note: *** $p < 1\%$, ** $p < 5\%$, * $p < 10\%$

Source: Researcher's Computation (2025-2026).

This study was undertaken with the use of quantile regression technique to x-ray the effect of number of health workers that emigrated LACCs and the effects of other control variables have on child mortality rate in LACCs. This is carried-out to bring to the notice of the concerned LACCs governments the influences some of the employed independent variables have on *CMR* on the continent. This study reveals that *NHWE* clearly increases *CMR* in LACCs in all the quantiles, this is in tandem with the studies of Mahame et al. (2025), Amm (2020), Imaidon (2018), Chauvet et al., (2013), and Bhargava et al., (2011). Contrarily, *GDPPC* is inversely associated with the *CMR*, and this is in support of the study of Amm (2020) also. Similarly, the inverse relationship between *DGGHE* and *CMR* is also in consonance with the study of Amm (2020). *PDPC* direct, and inverse relationships with *CMR* are not statistically significant; likewise, the two results of *GE*, and only one result, are statistically significant.

The justification for higher *CMR* resulting from poor healthcare delivery in LACCs is based on the higher number of health workers emigration, which is detrimental for child survival on the continent. An increased in GDP per capita in these selected countries has allowed the constituted authorities of LACCs to triple their investment in the provisions of healthcare facilities, which has raised and enhanced the LACCs citizens' access to healthcare services and facilities. Governments' coordination and financial commitments and dedications to the provisions of modern healthcare facilities yielded expected results in terms of qualitative healthcare service delivery for citizens, hence breed enhanced health outcomes, and cutting *CMR* in LACCs. The results indicated that the higher *PDPC* resulted in reduced *CMR* in two results and increased *CMR* in one result, although the results are not statistically significant. The justification for this is that non-emigration of health workers results into good healthcare service delivery and thus enhanced child survival in LACCs. In contrast, the inefficiency of the available health workers on the ground can result in increased child mortality rate in LACCs, and the insignificant results can be a result of corruption and ineffectiveness of health institutions in these selected countries. Effectiveness in the activities of government institutional agencies may have resulted in *CMR* cut, if otherwise, inefficiency resulted.

These findings have essential implications for policy and future research. Foremost, emigration of health workers in LACCs results in a decline in the number of available health workers. The health systems of many countries of LACCs are already handicapped by health workforce paucity. Failure on the parts of the selected countries' governments of LACCs to supplement the human capital loss with the newly employed additional health workers may result in the crumbling of these countries' health systems. In addition, health workers emigration can lead to the reduction in physician density per capita and results in huge workloads for individual available health workers in the country. This huge workload of individual health workers can result in poor healthcare delivery for patients, especially poor child healthcare, and hence increased *CMR* in LACCs. Paucities of health workers in LACCs as a result of emigration create a lacunum of skilled healthcare workers in all the agrarian environments, thus jettison these areas with the required and needed healthcare services or provisions of partial services, thereby making these areas partially catered for. This acute supply of health workers can result in undiagnosed, and untreated patients' cases and lingered on increased mortalities particularly among children. Furthermore, medical tourism is what the LACCs citizens with specialized, and essential cases always resulted in. Many Latin American and Caribbean countries citizens' incapacitation to afford overseas medical-cares signals allowing the treatment to go totally, thus raising the deaths rate particularly among the children.

4. RECOMMENDATIONS, CONCLUSION AND LIMITATIONS

This work utilized *NHWE*, *GDPPC*, *DGGHE*, *PDPC*, and *GE* to scrutinize the influence of each individual independent variable on *CMR* in 10 LAC countries within the time period of 1990 and 2021 with the usage of quantile regression. The compendia of the findings are specified hence; *NHWE* has a direct and significant influence on *CMR*, while *GDPPC* and *DGGHE* have inverse significant effects on *CMR*, *PDPC* has a mixed non-significant influence on *CMR*, while *GE* also has a mixed influence on *CMR*, and it is only a result that is significant. Conceptual indications signal that, improving health workers emigration demands alliance between exporting and importing nations, higher emoluments, improved working conditions, job security, timely retirement benefits, and others. Curbing this important matter requires diplomatic resolutions such as policy reforms, international cooperation to keep talented, and reduce reliance on aid, and enhanced healthcare infrastructure. Pragmatically, health workers emigration end-ups in reduced access to quality healthcare for these selected LAC countries' citizens, economic losses and impede growth and development of health sector of LACCs, couples with shrinkage of human capital, which can hinder the viability of LACCs healthcare systems.

Premise on these findings, these recommendations are thus put forward to better health workers conditions via enhanced salary that match up with international standard, improved working terrains, career development to health workers to hold them in LAC countries, LACCs governments should increase the number trained health workers yearly by teaming with the global institutions as this can assist to trade-off the loss of health workers emigrating from LAC countries. Prioritization and acceleration of economic growth rate yearly by LACCs leaders will actually give boost to investments in healthcare facilities in the continent, and this will raise the access of LACCs citizens to healthcare facilities and services, medications, and drugs and cut mortality particularly child death in the continent. LACCs governments in their quests to cut mortality especially child death should allow yearly incremental percentage on domestic general government health budget. Also, accelerated and sustained policies that key into the increment of physicians' density per capita in each country should be vigorously pursued by the LACCs leaders. Government institutions or agencies responsible for supervising, and monitoring the performances, efficacy and effectiveness of health sectors in LACCs countries must be alive to their responsibilities in the areas of adherence to quality, make corruption less fashionable in order to achieve maximum health results in

LAC countries. Additionally, rich-income countries need to reduce their reliance on low- and middle- income countries for the recruitment of their health workers.

Also, advocacy by the LAC leaders for the execution of ethical recruitment practices by the global health organizations like World Health Organization, Global Health Observatory, Institute for Health Metrics and Evaluation, and policies to cut harmful influences of health workers emigration on LACCs' health systems should be looked into. On a final note, LACCs' governments knowing the numerous positive influences that non-fleeing health workers have on child health, and other health outcomes should vigorously pursue these above mentioned recommendations couples with higher salaries, enlarged professional development, non-delayed and regular incentives for health workers, security of jobs, recruitment of more professional health workers in LACCs hospitals, maternities and clinics, provisions of modern healthcare equipment, shun political instability, training and re-training of health workers, and others as obtainable in saner climes, where LACCs health workers are fleeing to nip in the bud health workers' emigration syndrome to some extents in LACCs, and to also ensure efficient healthcare systems in the continent.

This research is limited by the following: the use of 10 LAC countries rather than the entire 33 countries of LAC, restricted time period (1990-2021) identified as another limitation of the work, employment of only one primary variable of interest (dependent variable) (*CMR*) is also another fingered limitation. In the same vein, this research beams its' search-lights on LAC countries only excluding other continents. Also, the study employed one theoretical under-pinning, and finally, one estimation technique was used. Premised on these stated limitations, future researchers are encouraged to beam their search-lights on the entire LAC countries, widening the time-period beyond 2021; as well as the employment of more dependent variables like Infant Mortality Rate (*IMR*), Maternal Mortality Rate (*MMR*), and other health outcome indicators. Additionally, the scope of the study can cover beyond the LAC continent, additional theoretical underpinnings can be included, and lastly, if more countries are selected based on the availability of data, employment of estimation techniques like System Generalized Method of Moments, Panel Autoregressive Distributed Lags, Fixed and Random effects, and others can be employed by future researchers who are eager to fill the gaps identified in this work.

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Author Contributions

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Oloniluyi, Adeleye Ebenezer. Data curation, review and editing, validation, and resources.

Olanipekun, Dayo Benedict. Formal analysis, project administration, software, and resources.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that they have no conflicts of interest, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethical approval & declaration

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Data and materials availability

All data associated with this study will be available based on the reasonable request to corresponding author.

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