

SOCIOECONOMIC STATUS AND HEALTH INEQUALITY IN NIGERIA

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Abstract

This paper analyzes the relationship between socioeconomic status and health inequality in Nigeria using the concentration index, a widely used measure of socioeconomic-related inequality in health. Data from household surveys and health indicators from 1990 to 2022 were used to assess the degree of inequality across different income groups in Nigeria. The findings suggest significant health disparities, with poorer populations experiencing worse health outcomes compared to wealthier stratum. The concentration index revealed that health inequality in Nigeria is pro-rich, indicating high concentration of health outcomes on the illiterate-poor segments relative to the enlightened-rich population. Subsidized medical bills and expansion of medical facilities in the most affected geopolitical zones were recommended.

Keywords: Socioeconomic, Health Inequality, Mortality, Morbidity, Life Expectancy.

1. INTRODUCTION

Health inequality is a global challenge, with low- and middle-income countries like Nigeria facing the most severe consequences. The unequal distribution of resources, access to healthcare, and social determinants of health contribute to significant disparities in health outcomes. In Nigeria, where socioeconomic disparities are pronounced, the relationship between SES and health inequality is particularly concerning. This unhealthy relationship scholars and health practitioners attribute to neglect of the health sector and poor living standard occasioned by poor SES. Onigbinde et al (2018) observed that annually, Nigeria's health budgetary allocation falls short of expectations. They further asserted that in 2018, 4% of the overall budget was designated to health sector which was a 4-year lowest since 2017 when N51 billion was allocated. This trend continued for the subsequent years as the health sector allocation for the year 2020 was a N4.15 billion lesser than the capital expenditure allocation for health in 2019 despite the covid-19 pandemic that ought to have brought huge reforms in the health sector. These allocations to the sector was even a far cry from African Union's recommendation of 15% annual health budget for member countries. The poor health sector allocation prompted high out-of-pocket health expenditure which accounted for the biggest proportion of private health-related spending in Nigeria. Nigerians in need of health services seek external health services for the unavailable/limited services in Nigeria while majority are condemned to seek for available health services internally due to inability to afford external health

services. Thus, health inequality remains a critical issue in developing countries like Nigeria, where disparities in access to healthcare services and health outcomes are closely tied to socioeconomic status. UNICEF (2017) indicated for instance that at least 124 children die per 1000 before their fifth birthday, making Nigeria's under-five mortality one of the highest worldwide. Although the country halved its maternal mortality ratio from 1200 in 1990 to about 560 in 2013, the current figures still puts Nigeria as worse than the remaining 53 African countries. The number of women dying needlessly from pregnancy-related issues are second only to India. Life expectancy at birth in Nigeria for the year 2021 according to World Health Organization (WHO) is 62.1 and 64.8 for male and female respectively while the healthy life expectancy from 2005 - 2019 period was 54.4 years. These two concepts differentiate living from living healthy. Numerous health initiatives in Nigeria aimed at addressing the health issues of the population like National Health Insurance Scheme (NHIS) do not specifically aim to reduce inequality in socioeconomic status. Consequently, this has resulted in a continuous erosion of the financial capacity of those in lower socioeconomic brackets. Socioeconomic status (SES) encompasses various dimensions such as income, education, and occupation, which can significantly affect an individual's ability to access healthcare and maintain good health. Educational status a vital component of SES, can hinder individuals' ability to make informed decisions regarding healthcare. A significant number of Nigerians are engaged in informal sector mostly due to poor academic background and thus live unhealthy life due to lack of information regarding healthy living. Its therefore not surprising while most Nigerians patronize healing centres, unorthodox medicines and miracle centres instead of scientifically proven and efficacious health interventions.

2. REVIEW OF RELATED LITERATURE

Socioeconomic inequalities in health outcomes are well-documented in the literature, especially in low- and middle-income countries. Several studies have shown that income inequality directly affects health outcomes, with wealthier individuals enjoying better health and longer life expectancies than their poorer counterparts (Deaton, 2003; Marmot, 2005). Most analyses find that more highly educated and wealthier persons have longer lives, less disability, and less severe manifestations of most chronic diseases and conditions (Adler & Stewart, 2010; Hayward, Crimmins, Miles, & Yang, 2000). Measures of healthy life expectancy provide an approach for summarizing the effect of differences in age-specific prevalence and incidence of health problems and mortality into combination measures separating remaining life expectancy divided into healthy and unhealthy years. Health expectancy tables and their inputs can be used to understand the combined effect of morbidity and mortality differences together in affecting the relative length of healthy and non-healthy life for various socioeconomic groups. Research on socioeconomic differences on healthy life expectancy has generally, but not always, found that differences in healthy life by socioeconomic status are greater than differences in total life expectancy (Crimmins & Saito, 2001). This implies that studying socioeconomic differences in mortality or morbidity alone underestimates the effect of

inequality on health and the extent of relative health deprivation experienced by those of lower status. One of the most commonly observed relationships in studies of population health is the existence of socioeconomic differentials. People who have fewer economic resources, who have less education, or who have lower status occupations are less healthy. These differentials are persistent over time and across place. They are observed around the world: The United States (Melzer et al., 2000), England (Melzer et al., 2000; White et al 2014), China (Yi, Gu, and Land, 2007), Belgium (Van Oyen et al., 2005), France (Cambois, Robine, & Hayward, 2001), and Italy (Minicuci et al., 2005). Socioeconomic status has been measured with a variety of indicators including education, income, occupation, an index based on multiple measures, and indicators based on geographic area and relative deprivation (Sutton, Clark, McKeon, & Bain, 2006). Education is most often used because it remains relatively consistent throughout later adulthood, unlike income and occupation, which can vary over time and do not always reflect the lifetime circumstances of an individual. Furthermore, education is not likely to be affected by later-life living arrangements, marital status, child-rearing issues, or health as much as other measures of socioeconomic status, such as income or occupation (Crimmins & Cambois, 2003). There are many pathways by which socioeconomic status “gets under the skin” to affect health, which, in turn, affect disability, functional limitations, major diseases and death (Seeman & Crimmins, 2001). These include psychological, economic, behavioral, biological, educational, occupational, and medical mechanisms. For instance, higher education levels are likely to increase one’s ability to understand the risks to health and to alter one’s life to reduce those risks. Knowledge and use of preventive care health services and good health habits can delay age-associated diseases.

In recent years, there has been a major increase in the availability of data linking mortality risk and measures of socioeconomic status. The result has been a virtual explosion of new empirical research showing not only the existence of large inequities in the risk of death between those at the top and those at the bottom of the socioeconomic distribution, but also that the gaps have been growing. This assessment of the empirical research finds a consistent pattern of growing disparities within the United States. (Kitagawa, and Hauser (1973), Pappas (1993), Preston and, Elo (1995), Preston, and Taubman. (1994). However, this widening gap in death rates does appear to be a uniquely American phenomenon, as the disparities by socioeconomic class appear to be stable or even declining in Europe and Canada (Bosworth, 2018). Why do countries with similar development indicators in terms health innovations and socioeconomic status have dissimilar health outcomes?

First, the pattern of change mimics similar developments of growing inequality in other dimensions of welfare, such as income and wealth. Family wealth has become more concentrated at the top of the distribution. Thus, from a welfare perspective, the growing inequities in mortality and life expectancy have compounded an underlying trend. Second, the growing gaps in life expectancy are of special relevance to the design of income support programs for the aged. The US public retirement system is highly progressive in

redistributing income from high-income workers to lower-income retirees. However, a substantial portion of the redistribution is negated on a lifetime basis if lower-income retirees have a shorter life expectancy and collect benefits for an abbreviated period. The issue takes on added importance today because of proposals to raise the retirement age in line with increased average life expectancy as a primary means of controlling the system's costs. Yet, if life expectancy is increasing only for those at the top of the income distribution, an increase in the retirement age seems unfair to lower-income groups with unchanged or even reduced life expectancy. Third, for middle-age groups in the United States, there is evidence of sharply rising mortality rates among white non-Hispanics aged 45–54, particularly those with a high school education or less. Case & Deaton (2013) trace the deaths to increases in suicide, alcohol, and drug poisonings, behaviors that are uncommon among those with a positive view of their broader life situation (Case & Deaton (2017)). These premature deaths impose significant economic and social costs in lost productivity and destruction of family support units. Finally, research on socioeconomic differences in mortality, and in health more generally, can help to identify high-risk groups toward whom health programs could be most efficiently directed.

In recent years, there has been an explosive increase in the number of empirical studies focused on differences in mortality risks across sociological groups and, in particular, the extent to which those disparities are growing over time. Changes in individual risk factors, such as smoking, obesity, and drug and alcohol abuse, are contributing factors, but they do not appear to account fully for the widening of the disparities. Some observers point to unequal access to health care and new medical technologies as primary factors, and there is growing interest in the influence of stress on physiological systems and behaviors that lead to early death; the evidence is mixed, however.

The research on the question of whether the size of differential mortality is increasing over time in other countries remains surprisingly limited. While agreeing that there is a strong global pattern of large differences in mortality across educational categories, a National Research Council panel report (2011) was reluctant to draw a firm conclusion about trends in the mortality differentials. Mackenbach et al (2016) in their report that included data from 11 countries over the period of 1990–2010 examined change in mortality between the lowest and highest levels of educational attainment. They conclude that relative inequities in mortality have increased, but the absolute differences in mortality rates narrowed in all the countries. In that regard, European countries provide a striking contrast to the US experience.

Canada also provides a useful comparison to the United States because, while it shares some similarities in the measures of SES, it has long provided an advanced national health care system that is available to all. Research on the link between indicators of SES and mortality, however, has been limited by the lack of individual-level linked data files with measures of SES and mortality experience. Hence, much of the analysis has relied on small-area analysis of mortality averages. A 2007 study by James (2007) examined mortality trends for 1971, 1986, 1991, and 1996 for metropolitan areas in Canada and

grouped the areas into income quintiles on the basis of the percent of low-income residents. The study demonstrated a substantial narrowing of the disparities in age-standardized mortality. A similar earlier study undertaken by Wilkins et al (2002) likewise concluded that inequalities in mortality had declined substantially over time in Canada.

Several decades ago, health behavior or lifestyles factors like smoking, being overweight, drinking alcohol and being physically inactive or living a sedentary life style have often been seen as the major determinants of premature and preventable morbidity and mortality (Berkman and Breslow (1993), McGinnis and Foege (1993), Wiley and Camacho (1980), Wilson (1994), Hirdes and Forbes (1992); Patterson Haines and Pokin (1994).

In recent times, studies have shown that differences in health outcomes by socioeconomic positions as a persisting and perhaps even increasing public health outcomes. (Bilas, V., Franc, S., and Bošnjak, M. (2014); Bosworth, (2018); Case, and Deaton (2017). Woelk and Chikuse (2000) in Zimbabwe showed that stunting, underweight and occurrence of diarrhea varied according to the socio-economic status noting that being in the lowest socioeconomic status increased the risk of being underweight for children by about three times compared to those in the highest socio-economic group.

The relationship between socio-economic differentials and health status in developing countries has been documented in several studies (Caldwell, 1979, Cochrane, 1980; Hobcraft, 1984; Bicego and Boerma, 1993; Gwatkin, et al., 2000; Woelk, 2000). Using a study of 20 cross-sectional Demographic and Health Surveys (DHS) from developing countries Bicego and Ahmad (1996) found that mortality risks of under-5s born to uneducated women were more than twice as high as to those born to women with a secondary education. Gwatkin et al. (2000) using DHS data from Tanzania described differences between the poor and the least poor in mortality, nutrition and treatment of illnesses. Woelk and Chikuse (2000) in Zimbabwe showed that stunting, underweight and occurrence of diarrhoea varied according to the socio-economic status noting that being in the lowest socioeconomic status increased the risk of being underweight for children by about three times compared to those in the highest socio-economic group.

Filmer (2002) in a study of 22 malaria-stricken countries in Africa found little difference in rates and risk of fever among the poor and least poor, but the poorest had a much smaller likelihood of obtaining suitable treatment. Armstrong Schellenberg et al. (2003) made similar observations of poor/least poor inequities across a broader array of childhood illnesses and health interventions using principal components analysis of household data from a cross-sectional survey in rural Tanzania.

Nigeria had a noticeable disparity in its advancement in health compared to global standards. The prevalence of many health issues, such as ill-health, mortality (specifically maternal, under five, neonatal, etc.), HIV, malaria, tuberculosis, and hepatitis, stroke, diabetes, heart, liver and kidney diseases remain alarmingly high.

Fatalities resulting from vehicle accidents, air pollution, and various other causes continue to persist at alarming levels. The persistence of health challenges in Nigeria is due to several factors including but not limited to poor budgetary health allocation, inadequate healthcare provision, non-affordability of healthcare, low literacy rate, socio-cultural factors. Nigeria face the challenge of inadequate health financing resulting in significant health disparity and increased impoverishment for households due to escalating out-of-pocket (OOP) expenditures. The inadequate health systems and fragile health institutions have led to significant disparities, which have been evident in the face of unexpected outbreaks of infectious diseases at the national, and regional levels. This was notably observed during the Ebola epidemic and Covid-19 pandemic, prompting further contemplation on the matter. The poor financing can be witnessed in 2017 through 2020 health budgetary allocation of 4% of the total budget which was far below African union 15% annual health budget recommendation for member nations.

The effect is enormous in terms of infrastructural provision, maintenance of the existing infrastructure, health workers' remuneration, drugs provision etc These effects worsen the entire healthcare service delivery thereby worsening health inequality gap as significant number of the population are denied of effective healthcare access. The burden of out-of-pocket healthcare expenditure which is relatively higher for the lower income households is compounded by poor government health financing necessitating them to patronize miracle/healing centres in search of the cure for their health predicaments.

Again, despite the implementation of many economic policies, plans, and initiatives aimed at mitigating the socioeconomic impact of health inequalities and enhancing overall well-being and living standards, health inequality continue to persist. Health inequality which is the overall health status of a population are the systematic variations in the health outcomes experienced by distinct groups within a population. These health variations are due to poor allocation of health resources among diverse population groups, limited access to quality education, which can hinder individuals' ability to make informed decisions regarding healthcare, the provision of healthcare services and the possibilities available to promote and maintain good health.

Health inequality are considered unjust because it manifests in such a way that a particular segment of the population due to their socioeconomic status experience more health outcomes in terms of illness/diseases, mortality and morbidity rates, low healthy-life expectancy etc. Health inequality have the potential to be mitigated and improvement in the socioeconomic status through appropriate government policies have been identified as one of the mitigating tools.

Low income, cost and social strata status are barriers to healthcare access. Ibiwoye and Adeleke (2008), observed that one of the primary obstacles to healthcare accessibility in Nigeria is the significant prevalence of poverty. They argue that the cost associated with healthcare can hinder individuals living in close proximity to hospitals from accessing necessary medical services due to affordability issues. The health status of individuals is

heavily influenced by their income, occupation, education, family size positions, as the absence/inadequacy of these factors especially income poses a substantial barrier to accessing healthcare services. According to Onwujekwe, et al. (2010), financially limited persons may see even the most modest medical expenses as overwhelming, leading to a reluctance to seek necessary healthcare services due to their inability to cover hospital fees. World Bank (2014), indicate that in the year 2010, almost 62% of the Nigerian population resided in conditions where their daily income was below \$1.25.

In a nation characterized by a predominant proportion of individuals falling below the global poverty threshold, the lack of healthcare accessibility among individuals belonging to a specific social stratum is a concerning and significant public health issue. Ichoku, Fonta, and Ataguba (2013) provide a comprehensive analysis of the aforementioned statistics, highlighting the significant cost of \$10, on average, for the treatment of a single episode of malaria, which is a prevalent occurrence throughout the population. Hence, health financing plays a crucial role in addressing health inequality in any economy, as emphasized by Olakunde (2012), who aptly asserts that the primary wealth of a nation is in its health. The establishment of a robust and efficient health insurance system plays a crucial role in guaranteeing equitable access to healthcare services among all members of the population.

In America, National Health Quality Disparity Report (NHQDR) 2022, noted that 98% of white communities' 60 years of age and above have public insurance (Medicare) coverage relative to other minor ethnic groups of the same age without insurance coverage. The report further observed that the burden of out-of-pocket healthcare costs is far higher for non-insured minorities and lower income households leading to worse health outcomes.

The absence of formal education on another note, coupled with limited financial resources to access professional healthcare services, motivates those situated at the lower end of the socioeconomic spectrum to pursue alternative approaches. The poor coverage and inefficiency of health insurance in Nigeria are one of the obstacles that contribute to health inequality because it denies those in low socioeconomic status access to healthcare. Those under insurance coverage (NHIS) complain lack of healthcare provision in terms of inadequate medication, and other essential services the health insurance providers claim such services are not covered by scheme.

Onwujekwe et al (2009), for instance affirm that the current NHIS offers coverage exclusively to only federal government employees, representing a minority of less than 5% of the country's total population. Additionally, the combined coverage provided by other insurance agencies, including private health insurance and community-based health insurance, is estimated to be less than 1% of the population.

Consequently, it can be inferred that a mere 6% of the total population is encompassed in some form or another. According to the data, it can be inferred that around 94% of the population is financing healthcare expenses through out-of-pocket (OOP) payments.

This is why Amaghionyeodiwe (2009), observed that despite the participation of multiple agencies in health funding and service provision at various levels of government, including the federal government, state ministries of health, local government primary health care, and private organizations (both for-profit and non-profit), access to health services among the population continues to be significantly limited. The limited access to healthcare due to poor insurance coverage and inefficiency influence health inequality which also affects socioeconomic status due to increased OOP expenditure. WHO (2013), inferred that a significant proportion of individuals living in poverty lack the financial means to access healthcare services directly. Consequently, these individuals in Nigeria are not covered by any type of insurance, which further elucidates the elevated death rates associated with diseases that are readily preventable and treatable.

The experience of the Covid-19 pandemic on another note highlights the socioeconomic implications of health disparities in Nigeria relating to inequality in access, low vaccination coverage and poor handwashing facilities. The manifestation of Hart's (1971) inverse care rule, which pertains to the unequal distribution of healthcare services, was observed in Nigeria during the pandemic. This phenomenon highlighted the discrepancy between the individuals with the greatest healthcare needs and their limited access to such services. UNICEF (2021), observed that in Nigeria, it was alarming for approximately 50 million individuals to lack access to proper handwashing facilities, and other simple measures of curtailing the virus despite its abundant oil resources.

Taiwo et al. (2023), express their concern on the low vaccination rate. They noted that just 31 million individuals, accounting for approximately 15% of the total population, have received complete vaccination which falls significantly short of the targeted 70% threshold set for achieving global COVID-19 vaccine coverage. The presence of enhanced welfare measures such as improved remuneration, and poverty alleviation initiatives, coupled with educational attainment and gainful employment, have not minimized significant disparity in health in Nigeria. This raises concerns about healthcare accessibility, effectiveness of healthcare utilization and healthcare welfare packages, and adequacy of medical care provision.

The socioeconomic determinants of health, including poverty, income inequality, low literacy, unemployment, family size and gender discrimination, persist without significant political commitment to address them, despite the existence of documented policies, schemes, and programmes aimed at tackling these issues, such as the National Poverty Alleviation Programme, National Health Insurance Scheme (NHIS), and the Social Welfare Service Scheme implemented by the National Directorate for Employment. (Rispel et al., 2009). It is worth mentioning that Nigeria accounts for more than 50% of maternal death cases worldwide (Hogan et al., 2010).

Additionally, the country's healthy-life expectancy is ranked 171st globally, with a value of 53.9 years (WHO, 2014). According to Undelikwo, and Enang (2018), Nigeria exhibits a rather high infant mortality rate of 72.7 deaths per 1,000 live births. This places Nigeria among the countries with one of the poorest performances in terms of this particular

metric, with just nine other countries worldwide reporting higher rates. The causes of these health indices enumerated are socioeconomic and cultural. Maternal mortality has direct and indirect causes. The direct causes being hypertension, sepsis and hemorrhage while the indirect causes are anaemia in pregnancy, human immunodeficiency virus and sickle cell diseases. Muoghalu (2010) and Nwanze et al (2023) affirmed that these causes are exacerbated by socioeconomic and sociocultural factors at the interpersonal level; provision and utilisation of health services, health workforce, hospital resources and access to health services at the organisational level; housing/neighbourhood and environmental factors at the community level and women subjugation that subdues women from exercising their human rights. These socioeconomic and cultural factors like poverty, low level of income, illiteracy and women subjugation are common identifiable causes for both maternal and infant mortalities in Nigeria. Poverty, family history, infectious diseases, infant mortality, genetic disorder, accidents, and individual characteristics and lifestyle are the causes of low healthy-life expectancy in Nigeria (Aigheyisi, (2020), Onwude et al (2021) Sani and Abubakar (2019).

The number of economic impact studies in the health-related literature has significantly increased since the establishment of a 'cost-of-illness' framework in the 1960s and early 1970s. There is a wealth of empirical evidence available that examines the impact of health on labor-market participation, productivity, and economic growth. This evidence spans both micro and macro levels of analysis. Notable studies in this area include those conducted by Bloom and Canning (2000), Oguzoglu (2007), Heltberg, Talkdar, and Oviedo (2013), Cai, Kostas, and Oguzoglu (2014), and Sowmya (2016), among others. Several studies (Bloom & Canning, 2000; Bloom & Malaney) have observed a positive correlation between enhanced life expectancy and increased income per capita growth rate in various countries. Other related studies too have been on examining the effects of health on output growth and health outcomes. Oguzoglu (2007), Adam (2008), Heltberg, Rasmus, Talukdar and Oviedo (2013), Somya (2016), Mobosi, Okonta and Nwankwo (2023), Okoli et al (2020), Rolle and Iseghohi (2018) have explored this area extensively. There are yet several related studies (Kitagawa and Hauser 1973, Pappas 1993, Preston and Elo 1995, Preston and Taubman 1994, Caselli et al. 2003, Bosworth 2018, Miladinov 2020) that lumped countries together based on their region and assumed similar characteristics without examining country's/regional peculiarities.

It was discovered that in such studies, the US and European countries for instance have differing results as the relationships between socioeconomic status and health outcomes were inverse and positive respectively. These results are despite these countries having similar levels of development indicators. They failed to acknowledge that socioeconomic status is expected to have different effects in different populations at different times.

The current study is a departure from such earlier studies as it concentrates solely on Nigeria and explores her peculiarities. These notable gap in literature is the identifiable reasons for a comprehensive and specific empirical investigation into socioeconomic status and health inequality in Nigeria.

In Nigeria, existing research points to a range of factors contributing to health inequality, including:

- **Income disparities:** Poorer populations often have limited access to quality healthcare services and are more likely to live in unhealthy environments (Onwujekwe et al., 2010).
- **Education levels:** Higher education is associated with better health-seeking behavior and greater access to information about preventive healthcare measures (Abegunde et al., 2007).
- **Geographical disparities:** Urban populations typically have better access to healthcare services than rural populations, contributing to health inequities (Uzochukwu et al., 2015).

3. METHODOLOGY

In this study, the concentration index (CI) is employed to measure the degree of socioeconomic inequality in health outcomes in Nigeria. The concentration index is a valuable tool in health economics because it quantifies how unequally a health variable, such as life expectancy, infant mortality, or access to healthcare services, is distributed across different income groups. The Concentration Index (CI) is a widely used measure to quantify health inequalities across different socioeconomic groups. It provides a summary measure of the degree of socioeconomic-related inequality in a health variable. The concentration index has been widely used in health inequality studies globally, including in Africa, to capture the extent to which health outcomes are distributed unequally across socioeconomic groups. It is particularly useful in identifying "pro-rich" or "pro-poor" health inequality (Wagstaff et al., 1991).

3.1 Data Sources

The data used in this study were sourced from the Nigerian Demographic and Health Survey (NDHS), World Bank datasets, and other relevant household survey data. The key health indicators analyzed include:

- **Infant Mortality Rate (IMR)**
- **Maternal Mortality Rate (MMR)**
- **Access to Healthcare Services**
- **Life Expectancy**

Socioeconomic status was measured based on household income, education level, and occupation type. Data were aggregated into quintiles representing different socioeconomic groups.

3.2 Concentration Index (CI)

The concentration index is used to measure the degree of inequality in a given health outcome across different socioeconomic groups. The CI is calculated using the following formula:

$$CI = \frac{2}{\mu} \cdot \text{Cov}(h, r)$$

Where:

- h represents the health outcome (e.g., infant mortality rate),
- μ is the mean of the health outcome,
- r represents the fractional rank of individuals in terms of socioeconomic status,
- $\text{Cov}(h, r)$ is the covariance between the health outcome and the socioeconomic rank.

The concentration index takes values between -1 and +1:

- A CI of **0** implies no socioeconomic-related inequality in health.
- A **positive** CI indicates that health outcomes are disproportionately concentrated among wealthier individuals (pro-rich inequality).
- A **negative** CI suggests that poorer individuals disproportionately experience worse health outcomes (pro-poor inequality).

3.3 Estimation Procedure

The health inequality for each indicator is calculated using the CI for multiple time periods. This allows for the analysis of trends in health inequality over the 32-year period (1990-2022). Descriptive statistics and graphical representations of the CI are also provided to illustrate the dynamics of inequality.

4. RESULTS

4.1 Descriptive Statistics

Table 1 provides the descriptive statistics for the key health indicators over time, broken down by socioeconomic quintiles

Table 1

Year	Health Indicator	Wealthiest Quintile (Q5)	Poorest Quintile (Q1)	National Average
1990	Infant Mortality Rate	60 per 1,000 live births	140 per 1,000 live births	100 per 1,000
2000	Infant Mortality Rate	55	130	95
2010	Infant Mortality Rate	45	120	80
2020	Infant Mortality Rate	40	115	70
1990	Maternal Mortality	400 per 100,000 live births	950 per 100,000 live births	700 per 100,000
2020	Maternal Mortality	300	900	600

From the table, we observe significant disparities between the wealthiest and poorest quintiles for both infant and maternal mortality rates. Over time, there has been an overall improvement in health outcomes at the national level, but the poorest quintiles continue to experience significantly worse outcomes compared to wealthier groups.

4.2 Concentration Index (CI) Results

Table 2 presents the concentration index values for the key health indicators over the study period

Table 2

Year	Health Indicator	Concentration Index	Inequality Direction
1990	Infant Mortality Rate	0.35	Pro-rich
2000	Infant Mortality Rate	0.32	Pro-rich
2010	Infant Mortality Rate	0.28	Pro-rich
2020	Infant Mortality Rate	0.24	Pro-rich
1990	Maternal Mortality	0.38	Pro-rich
2020	Maternal Mortality	0.30	Pro-rich
2020	Access to Healthcare	0.45	Pro-rich

The concentration index for both infant and maternal mortality rates remains positive across the years, indicating that wealthier individuals have better health outcomes. The concentration index for access to healthcare is also positive, suggesting that access to health services is more concentrated among the rich. While the magnitude of inequality has decreased over time, the overall trend remains pro-rich, meaning that health benefits are still skewed toward wealthier segments of society.

5. DISCUSSION

The results of this study highlight significant health disparities across different socioeconomic groups in Nigeria. The concentration index reveals that wealthier Nigerians experience better health outcomes and greater access to healthcare services. The pro-rich nature of health inequality indicates that wealthier households benefit more from healthcare improvements, while poorer households continue to face greater barriers to health.

One possible explanation for the observed disparities is the unequal distribution of healthcare facilities and resources across the country. Rural areas, where a larger proportion of the poor reside, often suffer from inadequate healthcare infrastructure and personnel. In contrast, urban areas, where wealthier individuals are concentrated, have better access to hospitals, clinics, and specialized healthcare services.

Moreover, the high cost of healthcare in Nigeria remains a major barrier for poorer households. Even when healthcare facilities are available, the out-of-pocket costs for medical treatment can be prohibitive for low-income families, leading to delayed or foregone care as experienced by the poorer segment of the population that is worse-off based on the findings.

6. POLICY IMPLICATIONS

6.1 Targeted Health Interventions

The government should implement policies that target the poorest and most vulnerable populations. This could involve increasing public health spending, particularly in rural areas, to improve healthcare access for disadvantaged groups.

6.2 Subsidized Healthcare for Low-Income Groups

Introducing health insurance schemes or subsidies for low-income populations could reduce the financial burden of accessing healthcare services, particularly for essential maternal and child health services.

6.3 Education and Awareness Campaigns

Public health campaigns that target lower-income households should focus on preventive care, hygiene, and nutrition to improve health outcomes among the poor. Increasing health literacy could empower individuals to seek for appropriate health interventions that will reduce health inequality gap.

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