

Socio-Economic Inequalities in Adult Mortality Among The Geopolitical Zones in Nigeria

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Abstract

Increased longevity is the desire of every individual and no one will rationally ignore minimising the risk of untimely death in spite of numerous challenges in daily life. Mortality numbers are interesting source of information on the national health because they are objective figures that can provide a broad image of the health situation of groups of interest. Hence, this paper examines the pattern of socio-economic inequalities in adult mortality across the six geopolitical zones in Nigeria using (2008 NDHS datasets).

Mortality was calculated based on the sibling mortality reports of the respondents. In total, the estimates are based on mortality histories of 48,871 individuals covered in the NDHS. Mortality levels are measured along with household's socio-economic status in each zone, that is, the degree to which adult mortality is more unequally distributed among different wealth quintiles in the six geopolitical zones in the country. The adopted quintiles include the poorest, poorer, middle, richer and richest.

It is revealed that in all the geopolitical zones, relative inequalities became larger, implying that the existing burden of mortality became more unequally distributed across socioeconomic groups. Socioeconomic inequalities in mortality size were relatively large among the northern zones compared to their southern counterparts. The middle class recorded highest mortality in North Central, poorest in North East, poorer in North West, Richer in both South East and South South and the richest in South West.

There is the need to reduce the socioeconomic inequality so as to increase adult healthy years of life in Nigeria. One way will be to replicate the relative success story of National Health Insurance Scheme (NHIS) among the public servant of the federal government in the states as well as the highly populated informal sector.

Keywords: Mortality, socio-economic status, inequality, Nigeria, population

Introduction

Increased longevity is the desire of every individual and no one will rationally ignore minimising the risk of untimely death in spite of numerous challenges in daily life. For most developing societies, growth in real incomes is associated with increasing life expectancy and declining mortality rate. The economic value of increased longevity has been about as large as the value of measurable growth in non-health goods and services.¹⁷ Besides, better educated persons are more likely to have a good knowledge of what a person should do to be healthy.¹¹ In developing countries, several challenges have constrained health improvement; these include high incidence of infectious and communicable diseases, growing burdens of chronic and non-communicable diseases, poor health systems and inadequate human and material resources.¹⁵ Studies on the health of regional populations offer hints about the basic health inequalities that exist within a country and may therefore be useful for planners and providers of health care. A sizeable number of studies on regional/ethnic inequalities in health have been done in the last few decades.^{4,23} Also, mortality numbers are interesting source of information on the national health because they are objective figures that can provide a broad image of the health situation of groups of interest.

Pre-independent Nigeria consists of various cultural, ethnic, and linguistic groups who live in kingdoms and communities with traditional but sophisticated systems of government. At independence in 1960, Nigeria comprised of three regions (North, East and West). As the most populous African country, it is located at the eastern edge of the West African sub-region and currently operates a federal structure with three tiers of government - federal, states and local governments. It comprises of 36 States and the Federal Capital Territory (FCT), as well as 774 Local Government Areas (LGAs) with total population of over 140 million (2006 Census). The country is presently structured into six geo-political zones of North-Central, North-East, North-West, South-East, South-South and South-West.

Health care delivery in Nigeria has been shaped by its federalism whereby the three tiers of government collaborate in organisation, management and financing of health care system. This is demarcated along the primary, secondary and tertiary health cares as provided by the federal, state and LGAs. Primary Health Care (PHC) in Nigeria is expected to cover all Nigerians in their respective societies. It covers health centres (clinics, dispensaries and

health posts) responsible for the provision of general preventive, curative, promotive, rehabilitative and pre-referral care as the opening point for health care delivery. Since most of the health care provisions are at the primary and secondary levels, the differential roles of state and LGAs then becomes major factors in determining health status in the different states of the federation.²⁶

As a result, the Nigerian health sector is characterised by wide zonal disparities in health status, service delivery, and resource availability.¹ The much needed improvement on poor health status indicators has been very slow and this has been linked to low level of education, poor attitude of health care providers and distance to quality health care facility. In addition, user charges in the face of deepening poverty have constrained access for many Nigerian, especially those without formal education who are mostly economically disempowered. The profile of life expectancy for Nigeria during 1995-2009 periods shows a steady increase from average of 44.7 years in 1995, 45.9 years in 2000, 47.3 years in 2005 to 48.14 years in 2009. The 2009 figure may be a little higher than that of the Sub-Saharan Africa average, but it is lower than the average of 53 years found among the least developed countries (LDCs).¹

Although, Nigeria is reputed to have one of the largest health workforces in Africa comparable to Egypt and South Africa, workers are unequally distributed in favour of the health care services in urban centers of southern, tertiary. For few cadres of health workers, more than 50 percent of them work in the South Western part of the country with the majority living in the commercial city of Lagos.¹

Several studies have argued that, among others, inadequate resources is one of the many reasons for the low health status of Nigerians and this could also explain the regional variations in health status.¹⁹ Although, the relationship between socio-economic status and health has been given adequate attention by researchers,^{7,12,23} few studies (for example,^{5,20}) have paid particular attention to the impact of socio-economic status in reducing mortality among adults in Nigeria. Over the past several years considerable efforts made by the government at various levels are yielding positive results in curbing the infant, child and maternal mortality¹, yet there has been little or no emphasis on reduction of adult mortality especially those in their productive years. Considering how important

¹ Though, the fruitful efforts have been linked to the commitments to the achievement of the millennium development goals.

their contribution is to the national economy², it is necessary to look at this issue in a more analytical term.

Undoubtedly, mortality figure is high in Nigeria and the 2008 Nigeria Demographic Health Survey (NDHS) recorded that 30% of the mortality were of the productive age (15–60 years). Moreover, the adult mortality show unequal distribution along north-south divide of the country, that is the three zones of the north contribute 65% while 35% were from the three southern zones. This obviously poses a huge problem for economic development of separate regions specifically and the nation in general.

The objective of this paper is to explore the pattern of inequalities in adult mortality in Nigeria, both within and across the zones. It also looks at the role of socioeconomic status in explaining regional variations in adult mortality. This paper advances as follows: The next section (Section 2) presents a brief review on adult mortality in Nigeria; Section 3 provides some details of the data and methods for analysis; Section 4 presents results of the study and Section 5 gives conclusion and some policy implications.

Adult Mortality in Nigeria

Adult mortality, often viewed in the literature as a function of adult health, is generally influenced by three main determinants: the environment, human behaviour and ill health carried into adulthood from childhood.⁵ According to the 2008 World Health Organisation's statistics (published in 2011), the mortality patterns of adults (15-59 years) in Nigeria are mainly affected by the following causes in order of importance: communicable, maternal, perinatal and nutritional conditions³ (47%), non-communicable diseases (30%), respiratory infections (5%), maternal conditions (8%), nutritional deficiencies (1%) and injuries (8%). Among the factors found to have contributed to this state are the problems of poverty, ignorance and inadequate resource provision for health facilities. The survival of adults mostly lies in the ability of the health systems to make adequate provision of immediate and quality health care to its populace. And there is a consensus that socioeconomic status plays an important role in avoiding the deaths which

in several ways are preventable.²³

Socio-economic status has been defined as differential access (realised and potential) to desired resources which fall into three distinct spheres. The spheres, given by¹⁸ include material endowments (earned and investment income, real property and other fungible goods); skills, abilities and knowledge; and one's social network and the status, power, trustworthiness, and abilities of its members. Morris¹³ labelled the three sphere as material, human and social capitals that can be found at individual, household and community levels.

Individual's socioeconomic status is crucial for adult life and survival since it determines the amount of resources (food, education, employment, and health care) that are available to the individual which then determine the kind of physical and environmental exposure and the ability to prevent death by infections and diseases.² The individual characteristics are supplemented by the household-specific characteristics which include the nature of dwelling houses, access to safe water and good sanitation while essential infrastructures are the expected features in the community that influences the socioeconomic status. Accordingly, whatever variation that exists in the socioeconomic status at the various levels has major implication on the individual's health status and Savigny,²³ has documented several studies that established the relationship between socio-economic differentials and health status among the developing countries. Obviously these inequalities depend both on the direct impact that the various determinants of health (lifestyles, parental factors, geography, income, education, ethnicity) have on mortality as well as the distribution of these determinants across different socio-economic groups.²⁴

A number of studies have related adult mortality to socio-economic status.^{2,9,21-22} And since the strength of the relation between socioeconomic status and mortality vary among regional groups, some others have examined socioeconomic inequalities with their implications on regional inequalities in mortality.^{12,16,25} And this paper attempts to examine the Nigerian case.

Methods

Direct measurement of adult mortality (through death registration) has been applied extensively in the literature, nevertheless, with the paucity of such vital statistics coupled with inadequate knowledge of health status of the Nigerian populace,³ the indirect measure of adult mortality become

² They must produce for themselves and simultaneously provide economic support for the dependent population of a country.

³ These consist of tuberculosis, STDs excluding HIV, HIV/AIDS, diarrhoeal diseases, childhood-cluster diseases, meningitis, hepatitis B and C, malaria, tropical-cluster diseases, leprosy.

imperative. And the sibling history has been widely used to estimate adult mortality indirectly,^{2,8} hence, its adoption in this study. In a survey, respondents were asked to supply information on the survivorship of their siblings.⁴ However, a major limitation of this measurement involves the data accuracy. The ability and the precision of the respondents depend mainly on how they could vividly recall about the life and time of their diseased siblings, especially when they live in different households or having different socio-economic status.

In obtaining the sibling history, each respondent was asked to give the total number of his/her mother's live births, provide a list of all of the children born to the mother in ascending order, indicates if each of these siblings was still alive at the survey date. For deceased siblings, the age at death and number of years since the person's death were collected with cut-off age pegged at 12 years and the rates for female and male mortality (15-60 years) were selected in this study⁵ for the period zero to six years before the survey. This seven-year period is taken as a compromise between the desire for the most recent data and the need to minimise the level of sampling errors. The product of total number of siblings of the respondents and year-period gives Person-Years Observed (PYOs).

The socio-economic status was measured by the individuals' wealth index quintiles. The wealth index is often used to measure the household socioeconomic status and serves as a proxy for measuring the long-term standard of living based on household asset ownership.¹⁸ This methodology of constructing an index of household economic status based on an asset index built from weights chosen by principal components was proposed by Filmer and Pritchett.⁶ And a consistent method for estimating household wealth from surveys allows comparisons across zones in the wealth gaps for a range of socioeconomic outcomes. Besides its wealth effect use, the index also controls for household economic status conveniently. Based on the index, the socio-economic statuses of individuals were assigned to the residents of those individuals, and the resulting population was divided into quintiles that then represent proxies for socio-economic status. The quintiles developed were thus expressed in terms of quintiles of individuals of the

⁴ Information on siblings' history was only recorded in section for men and 20 siblings were provided for in the survey.

⁵ While good number of 15-year olds are involved in informal labour market, 60-year represent a generally accepted retirement age in Nigeria public sector.

total population at risk. The five quintiles were assigned in the continuum of poorest, poorer, middle, richer and richest¹⁵ as recorded in the survey.

Two popular measures of inequalities in the literature are relative (Rate Ratios) and absolute (Rate Differences) measures. In absolute measures of inequality, information on the magnitude of mortality differences between comparison groups is retained in the computation of the measure while information on the magnitude of mortality differences is not retained in the computation of the measure in the case of relative measures⁶. Notwithstanding, both measures disagree as to which group has more or less inequality. Absolute measures of inequality are based on direct measures of health (the rate of death per 1000 population). Relative measures of inequality are dimensionless, calculated as the value of the absolute measure of health divided by the mean value of health for a reference group. This means that whereas all deaths are of equal value for comparisons based on absolute measures, they are valued as a function of the health of the reference group when a relative measure is used.¹⁴ Thus, absolute measure of inequalities is applied in this paper since it is appropriate for policy purposes, especially where the population impact of health policy investments is the principal objective. This preference is informed by the expression of the extent to which the mortality burden is unequally distributed between socio-economic groups and such a distributional measure is a useful complement to measures of the overall level of mortality in a country. Other statistical measures of inequality adopted for this study include:

- Poorest-Richest ratio which compares the prevailing mortality rate in the poorest and richest quintiles.
- Concentration index which measures the extent to which deaths are distributed unequally across all five socio-economic quintiles (inequality concentration). This was calculated following the method of Kakwani.¹⁰ The closer this index is to zero, the less concentrated the distribution of inequality.¹⁵ This distributional measure is a useful complement to measures of the overall level of mortality in a country.

The data used were from 2008 NDHS, a nationally representative survey of 33,385 women and 15,486 men of age 15–49 and 15–59 respectively. The 2008 survey updated 2003 survey by including

⁶ Absolute involves the difference between the rates for the poorest and richest socioeconomic groups while relative involves the ratio of these rates.

information on adult mortality among other updates.

Results

Our result indicates that Nigeria experiences a high

adult mortality rate from the seven year-period preceding the 2008 NDHS. Table 1 below shows both zonal and national spreads of adult mortality across socio-economic groups.

Table1: Size of the zonal socio-economic inequalities in adult mortality in Nigeria

| | North Centra | North East | North West | South East | South South | South West | National |
|----------------|-----------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|---------------------------|-----------------------------|
| Poorest | 205 20% | 509 51% | 362 31% | 16 4% | 56 8% | 27 5% | 1,175 24% |
| Poorer | 227 22% | 187 19% | 371 33% | 35 8% | 76 11% | 73 13% | 969 20% |
| Middle | 280 27% | 177 18% | 206 18% | 106 24% | 162 24% | 91 16% | 1,022 21% |
| Richer | 171 17% | 93 9% | 119 10% | 161 36% | 226 33% | 134 24% | 904 19% |
| Richest | 142 14% | 23 2% | 88 8% | 128 29% | 167 24% | 241 43% | 789 16% |
| Total | 1,025 100% | 989 100% | 1,146 100% | 446 100% | 687 100% | 566 100% | 4,859 100% |

The table contains the number of death and the respective percentages across the different socio-economic statuses. The number rose with socio-economic status from poorest (20 percent) up to middle (27 percent) and declines afterwards in north-central zone. While in North East, poverty was a major cause of mortality as the poorest accounts for 51 percent of total zonal mortality figure and whereas the rich just contributed 11 percent. In the North West, however, adult mortality size initially increased along the movement from poorest to poorer (31 to 33 percents) but declined. Generally, adult mortality sizes are inversely related to wealth among the southern zones and specifically, the South East and South South Zones show similar trend of mortality decline along the increasing wealth quintiles up till the richer quintile while it declines among the richest. But the inverse relationship cut through all the quintiles in the South

West.

Also, a closer look at Table 1 shows that middle class recorded highest mortality (27 percent) in North Central, poorest (51 percent) in North East, poorer (33 percent) in North West, Richer in both South East (36 percent) and South South (33 percent) and among the richest (43 percent) of the South West Zone. Globally, more death is seen to occur in the northern parts of the country than it does in the southern parts and the distribution shows a direct relationship between poverty and mortality in the north while they proved to be inversely related in the south. Nationally, the richest fellows have least mortality figure while the poorest have the highest figure. Moreover, the PYOs that were obtained for each of the quintile in each zone are presented in the following table.

Table 2: Table 2: Person-Years Observed (PYOs) of each zone

| Quintile | North Central | North East | North West | South East | South South | South West | Total |
|----------------|---------------|---------------|---------------|--------------|--------------|--------------|---------------|
| Poorest | 19859 | 50127 | 34643 | 2338 | 5201 | 3934 | 116102 |
| Poorer | 24136 | 25298 | 35000 | 5124 | 10829 | 10059 | 110446 |
| Middle | 29659 | 20013 | 22750 | 13839 | 20818 | 12663 | 119742 |
| Richer | 21931 | 13972 | 19691 | 19719 | 29204 | 23366 | 127883 |
| Richest | 19082 | 3479 | 10577 | 14875 | 25284 | 36533 | 109830 |
| Total | 114667 | 112889 | 122661 | 55895 | 91336 | 86555 | 584003 |

We took the ratio of mortality size in table 1 and PYOs in table 2 and multiplied by a thousand to

obtain the mortality rate of the Table 3 below.

Table 3: Pattern of the zonal socio-economic inequalities in adult rate in Nigeria

| Quintile | North Central | North East | North West | South East | South South | South West | Total |
|------------------------------|---------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Poorest | 10.32 | 10.15 | 10.45 | 6.84 | 10.77 | 6.86 | 10.12 |
| Poorer | 9.41 | 7.39 | 10.60 | 6.83 | 7.02 | 7.26 | 8.77 |
| Middle | 9.44 | 8.84 | 9.05 | 7.66 | 7.78 | 7.19 | 8.54 |
| Richer | 7.80 | 6.66 | 6.04 | 8.16 | 7.74 | 5.73 | 7.07 |
| Richest | 7.44 | 6.61 | 8.32 | 8.61 | 6.60 | 6.60 | 7.18 |
| Total | 8.94 | 8.76 | 9.34 | 7.98 | 7.52 | 6.54 | 8.32 |
| Poorest-Richest Ratio | 1.39 | 1.54 | 1.26 | 0.8 | 1.63 | 1.04 | 1.41 |
| Concentration Index | -0.062 | -0.074 | -0.078 | 0.038 | -0.044 | -0.014 | -0.060 |

The results in Table 2 indicate that the adult mortality rate was 10.12 deaths per 1,000 years of exposure for poorest individuals in Nigeria and keeps decreasing with an increasing socio-economic status. The effect of the decrease ensures that the average national mortality rate stands at 8.32 which is somewhat closer to the middle quintile. The findings show an inverse pattern such that adult mortality rate declines with increase in the socio-economic status of the individual.

Within the geopolitical zones, adult mortality rate fell from 10.32 deaths per 1,000 years of exposure for poorest individuals in North Central zone to 7.44 for richest individuals. North East reveals a little lower zonal rate compare to North Central Zone, it starts from 10.15 deaths for poorest individuals but declines sharply with increasing socio-economic status up till 6.61 for richest individuals. The same trend was observed for the North West zone but highest among the poorest and poorer individuals with 10.45 and 10.60 deaths, the rate declines from 9.05 for middle individuals to 6.04 for richer individuals and increasing thereafter.

In the southern zones, beginning from the South East, the rate rises steadily from 6.83 for poorer individuals to 7.66 for middle individuals and the increase was sustained afterward. The changes in mortality rate across the socio-economic grouping in the South South zone shows higher concentration among the poorest with 10.77 but sharply declined to 7.02 for poorer individuals, slightly increases for middle individuals and decline thereafter. Finally, in the South West, adult mortality rate was 6.86 deaths for poorest individuals and increases to 7.26 deaths for poorer individuals but declines marginally to 7.19 for middle individuals; it further declines to 5.73 for richer individuals but later increases to 6.60 for richest individuals.

Aggregately, North West zone has the highest rate in the country; it has 7.52 per 1,000 years of exposure while South West has the lowest mortality rate in the country (6.54 deaths per 1,000 years of exposure) when compared to other zones.

Discussion

The poorest adults are about 39 percent more likely to die than the richest adults in North Central while the poorest individuals are 54 percent more likely to die than those in the richest in North East and 26 percent more likely to die in North West. Meanwhile, adults in the richest individuals are about 20 percent more likely to die than those in the poorest individuals in South East while they are about 63 percent more likely to die than the richest individuals in South South but and only 4 percent of adults in the poorest individuals likely to die than those in the richest individuals in the South West.

Furthermore, there is existence of a lopsided concentration of the mortality to the disadvantages of the poor due to the disproportionate concentration of the mortality among the poor individuals. It was observed that the North West zone has the highest asymmetrical concentration of the mortality inequality distribution while South West has the lowest. But in the South East, the positive concentration index signifies an unequal concentration of the mortality towards the rich individuals.

North-south segregation was particularly obvious in the pattern of adult mortality across different socio-economic statuses with an inverse and a direct relationship existing among the northern and southern zones respectively. Socioeconomic inequalities in total mortality were relatively large among the northern zones as its figure submerged that of the southern zones. Though, in each all the

observed zones, relative inequalities became larger, implying that the existing burden of mortality became more unequally distributed across socioeconomic groups.

Therefore, mortality rates were higher in the three northern zones than their southern counterparts with each of them contributing higher than the national figure while each of the southern zones had a lower figure than the national mortality rate, this has serious implication on the dependency ratio. This is not surprising since the three southern zones are more urbanised with higher literacy rate and have greater proportions of their populations in the higher wealth quintiles than the northern zones. Also, the three northern zones altogether contributes more siblings and more mortality (60 and 65 percent respectively) than the three southern zones (40 and 35 percent respectively).

The zonal disparity can also be attributable to variations in the behavioural risk factors among different zones. In southern zones of the country, smoking, alcoholism and an unhealthy dietary are more common among those in higher socioeconomic quintiles than among those in lower quintiles. Also, when family ties are generally very close, it can, to some extent, cushion the adverse effects of low socioeconomic status.

Conclusion

This paper examined the pattern of socio-economic inequalities in adult mortality across the geopolitical zones in Nigeria. Nationally, the result revealed that 44 percent of the adult mortality occurs among the poor, 21 percent among the middle class while the remaining 35 percent are among the rich. The mortality varies across wealth quintiles within all six zones; and varies across the zones, particularly between the northern and the southern zones. From the findings, the high adult mortality rates generally reflect poor levels of adult health and more deaths would be eliminated if the poor could be elevated to the level of the rich (as measured by the difference between poorest and richest mortality rate). Hence, pro-poor policies are needed more so as to raise their income levels; such policies should be much beneficial to the poor to avoid more inequality.

Paucity of data, notwithstanding, socioeconomic inequalities in mortality can also be associated with levels of social support (Vermeulen and Penninx, 1994; Wilkinson, 1999). A strong social support can improve upon the socioeconomic inequalities within some zones.

Though, the three tiers of government in Nigeria are recently making concerted effort to improve health care utilization of the poor by making it readily available and more affordable, apparently, much more are needed to be done especially in reducing the socioeconomic inequality so as to increase adult healthy years of life in Nigeria. Moreover, the Primary Health Care (PHC), which is the closest to the masses, should be provided within accessible range to reduce the travel time and cost, especially to rural dwellers while giving proper attitudinal training to health care providers coupled improved health education awareness in the country. The National Health Insurance Scheme (NHIS), which has successfully captured the public servants of the Federal Government, should be replicated in the states as well as the highly populated informal sector.

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