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Changing Levels and Patterns of Under-five Mortality: Empirical Evidence from Nigeria Demographic and Health Survey
(Changing Levels and Under-five Mortality)

Gbemisola W. Samuel & Gbolahan A. Oni

Dept. of Econs & Dev. Studies
Covenant Universit, Ota, Nigeria
gbemisola.samuel@covenantuniversity.edu.ng
gbolahan.oni@covenantuniversity.edu.ng

Abstract: This study examined the levels and patterns of under-five mortality in Nigeria within 2003-2013 using the Nigeria Demographic and Health Survey datasets for this period. In the study the mortality trends was related to some socioeconomic and health variables to explain factors that could have contributed to mortality changes. The descriptive approach through the use of tables and charts was adopted in the analysis. Results show that under-five mortality rate had declined from 187 in 2003 to 128 in 2013 (i.e., a decline of 32 percent). Under-five mortality declined with increase in mothers' education especially among mothers with less than secondary education. During the ten-year period, children who had DPT3 increased from 10.4 percent to 22 percent. Households who drank water from safer sources increased from 14.4 percent to 49.7 percent for urban areas and 2.3 percent to 32.7 percent in rural areas. Childhood diarrhea incidence declined by 45.2 percent. The study concluded that decline in under-five mortality may be attributed to improved immunization, safer water sources, and reduced incidence of childhood diarrhea. This study, therefore, recommended that both the national and state governments of Nigeria should intensify efforts to increase childhood immunization coverage, provide more communities and households with safe drinkable water in order to drastically reduce diarrhea diseases – a major cause of deaths in children. This will help to accelerate the decline in under-five mortality rate in the country.

Key Words- Under-five mortality; Trend; Immunization; Drinking water; Diarrhea; Nigeria

Introduction

Globally, under-five mortality rate was reported to have declined from 90 in 1990 to 48 in 2012 (United Nations Children's Fund, 2013). In Africa under-five mortality varies, ranging from one-quarter to one-third of children dying before reaching the age of five. Further, within the under-five age group, there are specific periods of increased vulnerability. For example, more than half of under-five deaths can be attributed to deaths that occur at the first year of life, especially within the first 24 hours (Marx et.al, 2005).

About 8.8 million children were reported dead in 2010 despite the global intervention to improve child survival (Black et.al, 2010). UNICEF in conjunction with other international organizations and national governments launched the Child Survival Revolution in 1982, which brought about the development of four intervention strategies of growth monitoring, oral rehydration, breastfeeding and immunizations majorly to improve on the level of child survival globally (Victoria and Barros, 2005). The major killer diseases of under-five children in the world are four, namely; pneumonia, diarrhoea, preterm birth complications and birth asphyxia (UNICEF, 2011).

Some of the countries in sub-Saharan Africa that had made substantial progress in reducing under-five mortality were those that have invested in the public health care services to those at the grass root and designed nutrition interventions, such as vaccination, breastfeeding, vitamin A supplementation, and safe drinking water. Although, report showed that coverage of low-cost curative interventions against pneumonia, diarrhoea, and malaria, which together cause over half the under-5 deaths in the region was generally low and this needs to be expanded (Policy Project, 2002). Child survival rate in a country shows the level of well-being in that nation. High rate of under-five deaths indicates that level of socio-economic development in such country is very low and vice-versa. This establish the findings of Mondal, Hossain and Ali (2009), that mother's education, father's occupation and the family's economic condition have strong impact on infant and child mortality. Therefore, the aim of this study was to examine the levels and trends of under-five mortality in Nigeria and identify factors that might have contributed to the movement using the Nigeria Demographic and Health Survey Data from 2003 - 2013.

Literature Review

Studies have shown that under-five children in Nigeria still die as a result of preventable diseases, which had made the country one of the unsuccessful African countries that could not make tangible improvements in child survival over the years (WHO, 2012; Olumide & Odubanjo, 2009; Policy project/ Nigeria, 2002). An infant born in Nigeria was reported to be at higher risk of dying (30 times more likely to die) before the fifth birthday, when compared to an infant born in a developed country (Policy project/Nigeria, 2002). Although, considering the mortality trends in Nigeria since 1960, it can be deduced that under-five deaths are falling, but the figures are relatively small compared to the MDG target of a two-thirds reduction in 2015 (Ojewunmi &

Ojewunmi, 2012; Fayehun & Omololu, 2010).

According to Fayehun and Omololu (2009), child mortality in Nigeria has majorly been influenced by ethnics' disparities and these disparities are in form of mothers' education, birth order, age of mother, place of residence and wealth index. Furthermore, Ogunjuyigbe (2004) reported that beliefs and behavioural practices played a significant role in determining child mortality. The study further show that mothers do not have clear perception of illness and treatment while some linked deaths of under-five to cultural beliefs.

Determinants of Under-Five Mortality in Nigeria

Mother's Educational Attainment

Studies have shown that there is a close relationship between mothers' educational attainment and lower mortality rates (Ojewunmi & Ojewunmi, 2012; Fayehun & Omololu, 2010; Uddin, Hossain and Ullah, 2009; Olumide & Odubanjo, 2009). This was further established through the findings in the NDHS Report (2008), mothers who had little or no education had under-five mortality rate of 209 compared to under-five mortality rate of mothers who had more than secondary education which was 68. The more educated a mother is, the more her chances of ensuring a healthy environment, nutritious food and proper health care for her child (Pandey, 2009; Uddin et.al, 2009; Frost et al, 2004).

Poverty

Children from poorer or rural households were reported to be more vulnerable those children who were from richer or households in the urbanized regions (UNICEF, 2010). A child born to a financially deprived and less educated family is at risk of dying perinatally or within the first month of life, since the mother was probably poorly nourished during pregnancy. Further, because of her poverty state which may not be to afford the cost for antenatal care or utilize the health facility for delivery of her child. Even though, the child is able to escape death in the first month, the child is then exposed to childhood illnesses, such as malaria and diarrhoea, due to poor living conditions, limited access to safe water and inadequate sanitation, malnutrition from household food insecurity, or ignorance about good child feeding practices. There is high level of competition for available resources when the family is large; due to this, members of the family are inadequately catered for, including the very young ones. All these factors are further aggravated by limited access to health services due to poor income and low levels of maternal education, often leading to the non-immunization of the child (Policy project/Nigeria, 2002).

Access to Safe Water and Good Sanitation

According to World Bank (2001), one-fifth of the total burden of disease in low income countries can be associated with environmental risk. WHO (2002), reported that among the 10 identified leading mortality risks in high-mortality developing countries, about 3% of these deaths (1.7 million) are attributable to environmental risk factors (Mutunga, 2004). Children in unhealthy or polluted environments are likely to be exposed to disease-causing agents, predisposing them to high mortality risks (Antai, 2011).

Also increase in the prevalence rates of diarrhoeal diseases, cholera, and typhoid is seen in situations of unsanitary refuse, excreta disposal, and use of unsafe drinking water. In addition, inadequate drainage and accumulated waste water encourage breeding of mosquitoes with increased malaria attacks (Policy project/ Nigeria, 2002).

Antenatal Care

Antenatal care (ANC) attendance is considered as one of the core elements of the Safe Motherhood Initiative package. When a pregnant woman fully utilize the antenatal care services there is always a good pregnancy outcome, because each visit made by the woman gives her access to timely medical check-ups and advice about possible serious complications during pregnancy or delivery in a health care facility (Wablembo and Doctor, 2013).

Other Factors

In the work of Antai (2011), there exists a wide variation in mothers' health practices among the six major regions in Nigeria. This health practices ranges from child immunization, maternal and child health care utilization, differences and child nutrition. The northern region recorded the highest proportion of home delivery, complications during childbirth, younger age of first marriage, younger age at first birth and inadequate knowledge and use of contraception when compared to their counterparts in the southern region.

Data Source and Methods

The data used were from the three National Demographic and Health Surveys (NDHS) carried out in 2003, 2008 and 2013. The National Population Commission of Nigeria and ORC Macro, USA (NPC and ORC Macro, 2003, 2008 and 2013) conducted the surveys. At each survey (i.e., 2003, 2008 and 2013), the total number of women interviewed were 7,620, 33,385 and 38,948 respectively. The descriptive Approach through the use of tables and charts were used to present the findings of this study. The information in the tables and charts were estimated in rates and percentages.

Findings

Findings from this study revealed that under-five mortality in Nigeria has reduced by 32% between 2003 and 2013. That is, from 187 deaths per 1,000 live births to 128 deaths per 1,000 live births respectively as presented in figure 1. Although, over the ten-year period, there had been a decline in under-five mortality rate in the country, however the rate of decline was low when compared with what was required to achieve the Millennium Development Goal of a two-third reduction in child mortality in 2015.

Figure 1: Levels of Under-five Mortality in Nigeria

Table 1, showed the rates of under-five mortality by mothers' educational attainments. It showed that mothers with secondary and higher education reported lower rates of under-five deaths compared to mothers who had little or no education. Generally, there was a decline in childhood mortality across all the educational categories during the 10 year period, however, the decline was much greater among children of mothers with primary education or less than for those mothers who had secondary or higher education. Between 2003 and 2013, under-five mortality declined by 33 percent, 32 percent and 20 percent for mothers with no education, primary education and secondary education respectively.

Table 1: Under-five Mortality rates by Mother's Education

	Under-five Mortality Rates			
Mother's level of Education	**2003**	**2008**	**2013**	**Percent Decline**
No Education	269	209	180	33.1%
Primary	186	159	128	31.2%
Secondary	113	116	91	19.5%
Higher Education	80	68	62	22.5%

Source: Authors' Compilation, 2015

Table 2, showed that the pattern of under-five mortality rates among women based on their wealth status had reduced between 2003 and 2013, although, relatively small. But there was an observation in the rates of women who were classified as richest, it was observed that in 2003 it was 79 deaths per 1,000 live births but increased to 87 deaths in 2008 and declined in 2013 to 73 deaths per 1,000 live births.

Table 2: Under-five Mortality Rates by Mothers' Wealth Status

Wealth Index	Under-five Mortality rates		
	2003	2008	2013
Poorest	257	219	190
Poorer	297	212	187
Middle	215	165	127
Rich	179	129	100
Richer	79	87	73

Source: Authors' Compilation, 2015

Figure 2a and 2b show that households who drank from safe water sources (i.e., municipal tap or borehole) increased from 41.7 percent in 2003 to 60.6 percent in 2013. Also during the same period, two-weeks incidence of childhood diarrhea decreased from 18.8 percent in 2003 to 10.3 percent in 2013 (Figure not shown). While there was an increase among households who depended on borehole as source of drinking water in both centers, it was observed that the percentage of households that depended on pipe water, public tap and other sources had declined

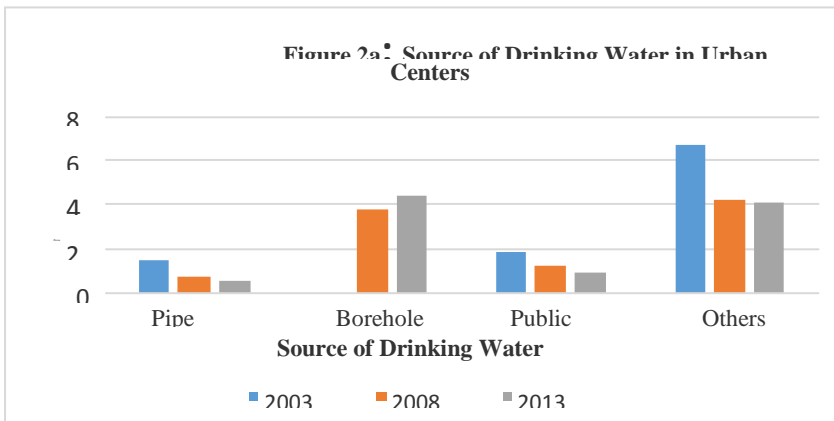**Figure 2a: Source of Drinking Water in Urban Centers**

Figure 3, show that the percentage of children who received DPT3 (i.e., those who received the required 3 doses of DPT) increased over the 10 years period. There was an increase of 114 percent in DPT3 coverage between 2003 and 2013 (from 10.4 percent in 2003 to 22.2 percent in 2013).

Fig. 3: Percentage of Children who received DPT 3 as indicated by Vaccination Card
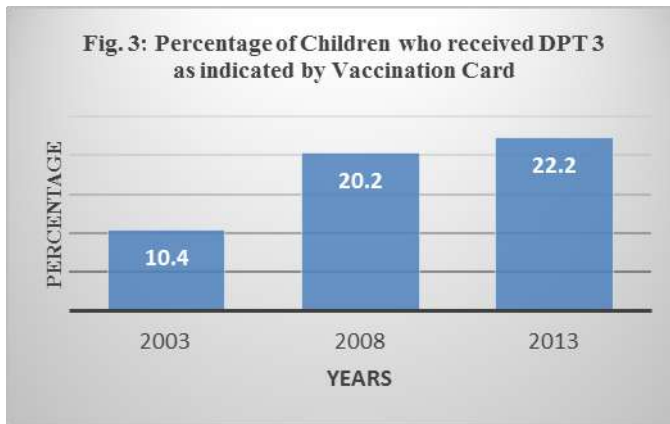
Discussion

One of the findings of the study was that there was an improvement in the number of household whose of drinking water was borehole and pipe water (i.e., safe water). This improvement could have been as a result of government intervention programs particularly in providing safe source of drinking water for the people. The improvement in safe water source could have been contributed to the decline in childhood diarrheal diseases. Further, there was also an increase in the level of immunization coverage and it can be deduced therefore, that the improvement might have contributed to the decline in childhood mortality by reducing the exposure rate to preventable diseases or illnesses.

Conclusion and Policy Implications

From the findings we concluded that there was moderate decline in under-five mortality in Nigeria between 2003 and 2013. The decline may have resulted from improvements in childhood immunization coverage, improved source of drinkable water and reduction in the incidence of childhood diarrhea diseases – which was a major cause of under-five mortality. This study, therefore, recommended that both the national and state governments of Nigeria should intensify efforts to increase childhood immunization coverage, provide more communities and households with safe drinkable water in order to drastically reduce diarrhea diseases – a major cause of deaths in children. This will help to accelerate the decline in under-five mortality rate in the country.

Acknowledgement

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