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2014-01-10
http://hdl.handle.net10539/13423

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CONTEXTUAL DETERMINANTS OF INFANT AND CHILD MORTALITY IN NIGERIA



By

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A Doctoral Thesis submitted to the Faculty of Humanities, University of the Witwatersrand, Johannesburg, South Africa; in fulfillment of the requirements for the award of PhD in Demography and Population Studies

September 2013

ABSTRACT

Background: Despite modest improvements in child health outcomes during the 20th century, infant and child mortality rates remain unacceptably high in Nigeria. With about 1 in 6 children dying before the age of five, Nigeria, like many other countries in sub-Saharan Africa, is not on track to achieve the Millennium Development Goal 4 (MDG 4) (i.e. reducing childhood mortality by 2015). Nigeria's under-five mortality rate is among the highest in the world. Addressing poor infant and child health outcomes requires scientific evidence on how best to tackle its determinants. Literature shows that knowledge about the determinants of child mortality at the individual level is insufficient to address the problem. This is because the characteristics of the household and community context where a child is born or raised tend to modify individual-level factors and therefore affect child survival. However, there are gaps in evidence on the effects of characteristics of the community contexts on child survival in Nigeria. Hence, this study examined the contextual determinants of infant and child mortality in Nigeria with a focus on individual, household and community-level characteristics. The study addressed three specific objectives: (1) to examine the levels and magnitudes of infant and child mortality in Nigeria; (2) to identify the individual, household, and community-level factors associated with infant and child mortality in Nigeria; and (3) to determine the extent to which the contextual factors account for regional variations in infant and child mortality in Nigeria.

Methodology: The study utilized data from 2003 and 2008 Nigeria Demographic and Health Survey (NDHS). The target population for this study (women aged 15-49 years who had at least a live birth in the five years preceding the survey) were extracted from the whole 2003 and 2008 NDHS datasets. Out of the survey's total sample size of 7620 women contained in 2003 dataset, analysis was restricted to the live born children of 3775 women amounting to 6028 live births within the five years before the survey. Similarly, from a total of 33,385 women contained in 2008 dataset, analysis was restricted to the live born children of 18,028 women who were 28,647 children delivered in the five years before 2008 survey. In order to achieve the objectives of this study, analysis was restricted to births in the five years before the survey. All analyses were completely child-based. That is, child was the unit of analysis. The dependent variables in this study are: (i) infant mortality – defined as the risks of dying during the first year of life; (ii) child mortality – defined as the risk of dying between ages 12 and 59 months; and (iii) under-five mortality – defined as the risks of dying between birth and the fifth birthday. All the outcome variables were measured as the duration of survival since birth in months. Guided by the reviewed literature and the conceptual framework, relevant independent variables were selected at the individual-, household- and community-levels. Three levels of analysis – univariate, bivariate and multivariate – were conducted. At the multivariate level, Cox proportional hazards regression analysis was employed because of its suitability for analysing time-to-event data and censored observations. In addition, using generalized linear latent and mixed models (GLLAMM) implementable in Stata, multilevel survival analysis was employed to consider the hierarchical structure of the DHS mortality data; and to identify contextual factors

influencing regional variations in infant and child mortality in Nigeria. Data were analyzed using Stata software (version 11.1). Indirect estimations were obtained using MortPak-Lite, Microsoft Excel, and Model Life Tables.

Key findings addressing objective 1: Indirect techniques gave the levels of infant mortality for both sexes in 2002-2003 as 93 per 1000 live births (male: 95/1000, female: 91/1000), and 78 per 1000 live births (male: 80/1000, female: 75/1000) in 2007-2008. Probabilities of dying between ages 1 and 5 were estimated at 0.049 (male: 0.051, female: 0.047) in 2002-2003, and 0.036 (male: 0.038, females: 0.033) in 2007-2008. Indirectly computed estimates of infant/child mortality were not substantially different from the estimates obtained from direct techniques. Using INDEPTH life table, e_0 (i.e. expectation of life at birth) in 2008 was estimated at 55.6 years for females and 51.6 years for males. This suggests that the data utilized in this study are of good quality. Bivariate results indicated a slight reduction in the proportion of infant and child death over the 1999-2003 and 2004-2008 periods.

Key findings addressing objective 2: Using both 2003 and 2008 data, region of residence, place of residence, ethnic diversity, community education, community infrastructures, and community health contexts were identified as important contextual determinants of infant and child mortality in Nigeria during the periods under study. For instance, results from 2008 NDHS data showed that children of mothers residing in the North-east were having significantly higher risks of infant (hazard ratio - HR: 1.54, $p<0.05$) and child (HR: 3.19, $p<0.05$) mortality compared to children in the South-west. Residence in communities with high proportion of hospital delivery was associated with lower risks of infant (HR: 0.73, $p<0.05$) and child (HR: 0.62, $p<0.05$) mortality. In addition, residence in communities with high concentration of poor households was significantly associated with higher risks of death during childhood (HR: 1.40, $p<0.05$). Many of the selected variables remained significantly associated with infant and child mortality after adjusting for the effects of the selected important characteristics, although some to a lesser degree. Results also showed that demographic factors were more important in explaining infant mortality while socio-economic factors were more important for child mortality.

Key findings addressing objective 3: Results from both 2003 and 2008 data indicated that substantial variations in the risks of infant and child mortality exist across regions in Nigeria, and that characteristics of the community contexts were important in explaining the observed regional variations. For instance, results from 2003 data indicated that the proportional change in variance (PCV) of 43.5% in the hazards of dying during infancy, and PCV of 44.4% in the risks of dying during childhood, could be attributed to community-level contextual determinants. Also, analysis of 2008 data showed that the PCV of 43.3% in the risks of dying before age one and PCV of 50.0% in the hazards of dying during childhood could be explained by community-level characteristics. Although, community factors appear to moderate the association between individual-level factors and death during infancy and childhood, adjusting for the effects of child-, mother- and community-levels characteristics in the final models indicated higher child mortality clustering at the community level relative to individual level. Conversely, higher infant mortality

clustering was found at the individual level compared with the community level. This result suggests that community-level attributes appear to play more important role in child survival during childhood than in infancy. Plausible explanation for this is that children's interaction with community environment or neighbourhood contexts is likely to be higher during age 12-59 months compared to the period under age one.

Conclusion: The study's findings showed that insufficient progress was made in infant and child mortality reduction over the 1999-2003 and 2004-2008 periods. Besides, increased variations in the risks of infant and child death were observed across the six regions of the country. Results demonstrated that characteristics of the community contexts tend to mitigate infant and child mortality risks in the South-west while community characteristics appear to exacerbate infant and child mortality risks in other regions, particularly in the North-east and North-west. Study's findings suggest that policies that will ensure substantial reduction in infant and child mortality in Nigeria must include strategies and programmes that rectify characteristics of the community contexts which exacerbate infant and child mortality risks, particularly in the socially and economically disadvantaged communities and regions of Nigeria.

Keywords: Infant, child, under-five, neighbourhood, community, context, mortality, demography and health survey, Nigeria