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As the attachment
NATIONAL YANG MING UNIVERSITY
INTERNATIONAL HEALTH PROGRAM

Report Research Grant:
Acute respiratory infection of children and cooking fuels of their mothers in Nigeria
Data Collection: Primary and Secondary Data Collection

WRITTEN BY:
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LECTURER:
Prof. Chi Chiao
Introduction

Acute respiratory tract infection (ARI) remains the leading cause of morbidity and mortality of children in developing countries especially with the highest burden in sub-Saharan Africa. It accounts for the death of more than two million children under the age of 5 years annually (Leowski, 1986; Ujunwa & Ezeonu, 2014; Williams, Gouws, Boschi-Pinto, Bryce, & Dye, 2002) and outside the neonatal period, accounting for about 0.8 million deaths (uncertainty range [UR] 0.68 million to 0.92 million) in 2013 (Liu et al., 2014). Globally, acute respiratory infection (ARI) accounts for 30-40% of the attendance to children outpatient visits and 20-30% of hospital admissions and 99% of deaths from ARI occurred in developing countries (Leowski, 1986; Nair et al., 2013). ARI (pneumonia) has been strongly linked to poverty, poor living conditions, household characteristics, HIV infection, poor health services and malnutrition. (Nair et al., 2010; Nair et al., 2013; Rudan et al., 2013).

A major cause of ARI identified by various studies is the household use of biomass cooking fuels. It has been estimated that approximately three billion people worldwide rely on biomass fuels (wood, charcoal, animal dung, crop residues, etc.) for domestic cooking and shows an association between exposure to biomass fuel and acquiring ARI. (Salvi & Barnes, 2010; Torres-Duque, Maldonado, Pérez-Padilla, Ezzati, & Viegi, 2008). Previous studies has been shown that exposure to biomass fuel smoke is responsible for a number of respiratory diseases such as Acute Respiratory Infections (ARI), Chronic Obstructive Pulmonary Disease (COPD), Tuberculosis and Asthma; Low Birth Weight; Cataract and Blindness (Bruce, Perez-Padilla, & Albalak, 2000). Solid fuel use is most prevalent in Africa and Southeast Asia where > 60% of households cook with solid fuels (Bonjour et al., 2013). Children and women receive the highest exposure of biomass smoke in developing countries (Kilabuko, Matsuki, & Nakai, 2007; Mishra, Smith, & Retherford, 2005; Torres-Duque et al., 2008; Ujunwa & Ezeonu, 2014) because of their frequent presence in the kitchen environment.
In 2010, report from global disease burden indicated that amongst the three leading risk factors for global disease burden was household air pollution from solid fuels (HAP; 4.3% [3.4–5.3]), as compared to (HAP; 6.8% [5.5–8.0]) in 1990, despite the gap in years, the use of solid fuel still remains one of the three leading risk factors for global burden of disease (Lozano et al., 2013). The prevalence of ARIIs are determined individually or collectively by a number of factors, which include age, sex, nutritional status, breastfeeding (type and duration), socio-economic status (SES), overcrowding, indoor pollution, passive smoking, etc (Ujunwa & Ezeonu, 2014).

Socio-economic status (SES) is one of the major determinants of health. Adults and children of lower socioeconomic status (SES) are at higher risk for a wide range of communicable infectious diseases, living conditions, especially respiratory infections (Cohen, 1999). In Guatemala, children of parents with lower levels of education had higher rate of respiratory illness than those with higher educated parents (Cruz et al., 1990). In India, it was reported that ARI episode among children were greater for those from families with lower per capital income and lower literacy level (Deb, 1998).

Other works shows that lower levels of formal education and unemployment is associated with greater incidence of acute lower respiratory tract infection (Sims, Downham, McQuillin, & Gardner, 1976). Also, in U.S children from poor families recorded absenteeism in schools as a result of ARI illness (Egbruolu & Starfield, 1982). From the evidence discussed above, highly deprived and vulnerable groups are associated with poverty, and poverty is a major predictor of susceptibility to respiratory infections and other communicable diseases. Greater risk for infectious illness among people with lower SES is thought to be attributable to increased exposure to infectious agents and decreased host resistance to infection.
In sub-Saharan Africa, limited resources for HIV prevention have still to compete with immediate threats to life such as malaria, acute respiratory illness, TB, maternal mortality, and diarrheal or vaccine-preventable diseases in children. The economic growth which should have contributed to the epidemiological transition in sub-Saharan Africa has slowed, with reversals of life expectancy in many countries (Marmot & Wilkinson, 2005). The devastating impact of HIV epidemic in sub-Saharan Africa (where two-thirds of infections have occurred and up to 50% of the adult populations are affected) can be attributed, in part, to the downstream consequences of income disparity, poverty, and adverse outcomes of elements of development programmes (Marmot & Wilkinson, 2005).

New infections may now be occurring fastest among young women of the lowest SES (Hargreaves et al., 2002). It is argued that in low-income sub-Saharan Africans countries, where poverty is widespread, increasing access to resources for women may initially increase risk of HIV or have no effect on risk-taking behaviors. In some parts of Southern Africa where per capita income is higher and within-country inequalities in wealth are greater, studies suggest that increasing SES may decrease risk (Wojcicki, 2005).

As at 2013, WHO reported 35 million people are living with HIV. Sub-Saharan Africa remains the center of the HIV and AIDS epidemic and the most affected region, with a total of 24.7 million out of the 35 million people living with HIV in 2013. As at 2013, the deaths due to HIV/AIDS estimates were 1.5 million globally and Africa accounts for 1.1million of these deaths (World Health Organization, 2013). The highest levels of HIV/AIDS are found in sub-Saharan Africa, with the World's highest burden of HIV/AIDS prevalence rate (Curley, Ssewamala, & Han, 2010). Highly deprived individuals are commonly associated with poverty, and poverty is a predictor of respiratory infections and ranges of all kinds of communicable and infectious diseases.
The UNAIDS Gap report in 2014 indicated 15 countries account for more than 75% of the 2.1 million new HIV infections that occurred in 2013. In every region of the world the report finds that there are three or four countries that bear the burden of the epidemic. In sub-Saharan Africa, just three countries Nigeria (West Africa), South Africa (Southern Africa) and Uganda (East Africa) accounts for 48% of all new HIV infections (HIV/AIDS, 2014). Due to the consequences of the burden of ARI, HIV infection, low socio economic environment in sub-Saharan Africa which is one of the major causes that results to having orphans and vulnerable children (OVCs) in the society, and the extended families being overwhelmed by the care of these children, many children (OVC’s) live and grow in deplorable conditions as compared with non OVCs resulting in dramatic disparities in the health status of the children.

Children born in Africa face more health risks than those born in any other part of the world. They are at risk of malnourishment, of being infected by preventable communicable diseases, exposure to losing a parent due to complications in child birth or to HIV/AIDS, and of many challenges associated with poverty, all of which defines the vulnerability of an African child (Radcliff, Racine, Huber, & Whitaker, 2012). Other works reported that children not infected with HIV may have higher morbidity if they reside in the same household with an AIDS patient because they are exposed to other infectious agents. Also positive association between parents’ morbidity and low weight for height for height in children less than 10 years (Ainsworth & Semal, 2000). This can be linked to the fact that the children may receive poorer care and supervision, and may suffer from malnutrition which makes them more vulnerable to opportunistic infections and may not have access to available health services (Xu, Wu, Duan, Han, & Rou, 2010).
According to the WHO Commission on Social Determinants of Health in the report on closing the health gap in a generation, within and between countries; there are vivid differences in health that are closely linked with degrees of social advantage. The disparities and inequalities in health are reported to arise because of the circumstances in which people grow, live, work and age. Therefore conditions in which OVC children and Non OVC children are born, grow, live and age would certainly be different, and this also transcends to disparity in the level of exposure to adverse health conditions. These conditions in which the cycle of life evolves in turn are highly dependent on political, social and economic forces directly influences household SES, household characteristics, acquiring ARI or not. This explains vividly that children living in regions are highly affected by poverty level, HIV/AIDS and ARI and those directly and indirectly affected by the disease within countries have obvious different life expectancy from those not affected as compared to those in other parts of the world.

Across sub-Saharan Africa, childhood illness and other diseases has resulted into high morbidity and mortality rates which can be attributed to disparity in socioeconomic status, household characteristics, place of residence, access to health care utilization, region of residence, standard of living and other factors which in turn results to disparity in acquiring ARI amongst children. According to prior studies (Filmer, 2005; Novignon & Nonvignon, 2012), individual and household socioeconomic status are associated with household characteristics, such as household wealth, household cooking fuel, and household education, which in turn influences the prevalence of under-five childhood illness in sub-Saharan African countries. This indicates clearly that poverty does not only influence prevalence of childhood illness at the macro level as shown in other studies, but also the individual and household level.
Research Objectives/Aims

1. To examine associations between country-level socioeconomic status, household factors, and acute respiratory infection (ARI) of children in Africa between orphans and vulnerable children (OVC) and non-OVC.


3. To explore associations between household characteristics and ARI of children (both OVC and non-OVC) and cooking fuels of mothers in Nigeria (Africa).

Methods

Data: Data Collection was derived from both Primary and Secondary data source

Primary Data Source (Ibadan Community)

The study was carried out in Ibadan community, specifically in subset of 5 Local Government Area of Oyo State, Nigeria namely (Ibadan north , Ibadan north east, Ibadan north west, Ibadan south east, Ibadan south east). Ibadan community is located in the suburb of Oyo City, along Lagos – Ibadan expressway and abodes the presitigious campus of the University of Ibadan, Oyo City, Nigeria. It is bounded to the North by Agodi community, to the East by Mapo community, to the South by Rig road community and to the Onireka by Iguosa community. The study population was made up of 45 household heads or their representatives in Ibadan community as at the time of the study.

Data were collected using a structured interviewer administered questionnaire with open ended questions as we depended on the Nigerian Demographic and Health Surveys for the close ended questions. Information sought from the respondents included socio-demographic data, orphanhood status, types of household cooking fuel and knowledge of the effects of the use of household cooking fuel on health.
Assessment of knowledge comprised of questions on exposure to solid fuel smoke, knowledge of symptoms of ill health due to such exposure and hospitalization as a result of such exposure. The total number of questions for assessing knowledge was six. A score of 1 was assigned to each correct answer while 0 was assigned to incorrect answers. The total score for knowledge was 6. A score of 0-3 was considered poor knowledge and a score of 4-6 was considered good knowledge. In this study clean household cooking fuel comprises cooking gas and electricity while unclean household cooking fuel comprises use of kerosene, sawdust, firewood, charcoal and vegetables.

We got assistance from two trained research assistants who were Community Health Extension Workers (CHEW) from the Department of Community Health, University of Ibadan, Ibadan City on data collection. The UK Registrar General’s classification was used to categorize the occupation of the respondents into skill levels (professional, managerial, skilled manual, semi-skilled and unskilled)

**Secondary Data Source (Nigerian Demographic and Health Survey)**

This cross-sectional study involves the use of Demographic and Health Survey (DHS) of the African Region from 2003-2013 Demographic Health Survey (DHS) data. The regional representative household survey collected data on a wide range of information including background characteristics, household and respondents characteristics, household structures, infant and child health mortality, child health, wealth, maternal morbidity and mortality, information on orphans and vulnerable children and HIV prevalence. The survey was conducted by each National Central Statistical Office of selected represented country in this study we employed the use of the 2013 data set available and in conjunction with U.S. Agency for International Development (USAID) and the ICF Macro, Calverton, MD, USA.
Data Analyses Plan

Our analytical approach includes descriptive as well as multilevel logistic regressions analysis are used to model the relationships between country- and individual-level SES, and ARI of children and cooking fuels of mothers. Because of the design of the DHS data collection procedure, the sample is potentially clustered on two levels: individual (level 1) and community (level 2). We specify a two-level multilevel logistic regression models (Snijders & Bosker, 2011) to determine the independent association between individual and community variables to ARI. Analyses would be weighted to adjust for sample design. Descriptive statistics for the analytical samples would be calculated using the survey commands in Stata version 13.0 (StataCorp, 2012). Also we aim to use the qualitative measures to capture the contextual situation analysis through the open ended questions received from the respondents.
References


