Welfare Costs of Risks and Management Options in Nigeria

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Abstract

Most of Nigeria's declining welfare indicators such as poverty, food insecurity and life expectancy at birth have been linked to high risk exposure. However, little empirical investigations have been made to uncover the dynamics of risks and their attendant welfare implications at the household level using aggregate national data. This study thus investigated risk prevalence, its welfare cost and management strategies within households in Nigeria. Data from the Harmonised National Living Standard Survey (NLSS) of households, collected between 2009 and 2010 by the National Bureau of Statistics, provided the data set for the study. The results revealed that predominant shocks within households in Nigeria are the death of the household head, conflicts in the community, death of a spouse, the household head being away, spouse being away from home, household head hospitalized and personal theft. Among variables that significantly reduce households' welfare were death and absence of the household head, and community conflict. Further, the results showed that the level of wealth significantly mitigates the negative impact of some shocks. Also, findings from the study revealed that households make use of mixed strategies to cope, mitigate and reduce risk

exposure and impact. The study concluded by recommending provision of well-managed and need responsive social infrastructure such as good health facilities, pipe-borne water, road network. In addition, people need to be sensitized to the need for life micro-assurance and government needs to subsidize it as this will help reduce the impact of the demise of the breadwinner on the household's welfare.

Keywords: Risks, Shocks, Welfare cost, poverty, Nigeria.

Introduction

It is becoming clear that Nigeria is one of the countries that will be unable to realise the objectives of the Millennium Development Goals as regards poverty reduction by the year 2015. This is based on the fact that progress towards halving the incidence of poverty in the country is slow. In 2004, the country's poverty rate was estimated to be 54.4 percent but later increased to 69 percent (or 112,518,507 Nigerians) in 2010, with the North-West and North-East geo-political zones recording the highest poverty rates in the country at 77.7 percent and 76.3 percent respectively, while the South-West geo-political zone recorded the lowest at 59.1 percent. However, the ability to escape from poverty is dependent on the level and magnitude of risk exposure and the ability to manage these risks effectively (Deacon, 2002).

Risks vary in nature and can range from macroeconomic shocks to natural disasters, health hazards, personal insecurity, and socially compulsive expenses such as dowry. Each of these categories contains a rich subset of varieties. Macroeconomic shocks can be caused by changes in the external trading environment and/or as a consequence of domestic policies. Natural disasters involve crop damage, housing and similar damages caused by weather. Risk, risk exposure, and vulnerability are closely related but not synonymous (see World Bank, 2001). Risks refer to uncertain events that are not well-being friendly. Risk exposure captures the probability that a certain risk will occur.

As revealed by Olaniyan et al. (2003), there are different types of risk and shocks at the root of poverty in Nigeria. Risks and shocks are more prevalent among poor households that are less able to deal with them. If the

poor must continue to survive under these vulnerable conditions, government should help to develop ways of reducing and mitigating and coping with the effects of the risk to their livelihoods. When people are not adequately protected (formally or informally) against risks, they lead to huge welfare losses. In the most extreme cases, they cause physical death. In many instances, they induce asset depletion (land, livestock, other physical assets, etc.) or delay investments (in capital assets, education, nutrition, etc.), which propel households into spiral irreversible losses and eventually poverty trap.

A deeper understanding of the linkages between risk and the associated welfare costs along with household level management options would provide an empirical basis for social policy, thereby strengthening both the analytical and operational content of the country's poverty reduction programmes. Moreover, it would provide needed empirical information on household risk situations that the country's nascent micro-insurance policy can leverage on. The shocks and the losses they induce and the response are specific to different countries and also differ in parts of the same country – especially in a country as large and complex as Nigeria. An examination of the welfare position in any country must consider the (immediate) welfare effects of idiosyncratic health, covariant drought and more systemic commodity price shocks. Given the negative effects of these shocks it is important to examine the occurrence and effectiveness of self- and mutual insurance strategies as well as measures for mitigating the negative welfare effects of such shocks. This will include identifying the key determinants and costs of people's management strategies.

Hence, analysing the welfare costs of risks and risk management options is key to understanding the dynamics leading to, and perpetuating poverty. This study would, therefore, provide a dynamic approach to the differential and total welfare costs of risks and risk management options not just to individuals and households but also to the country in general. The following objectives are pursued in this paper: (1) to identify and describe prevalent risks to households in Nigeria; (2) estimate the welfare cost of risk exposure; and (3) identify households' risk management strategies.

Literature Review

Risk and risk management options in Nigeria

A large proportion of the African population lives below the poverty line (UNDP, 2008). Within this context, many households face hard times due to risks such as illness, disability, unemployment, natural disasters such as flood, famine, or drought, other disasters, and global financial crises. While some of these risks affect all population groups equally; others have more intense impacts on the poor. Since the poor are more vulnerable to risks, they are constantly preoccupied with risk-averse and coping strategies to avoid sinking further into poverty. These are done at a high cost to their future livelihoods.

A plethora of efforts directed at analysis of poverty and poverty alleviation policy options in Nigeria have often focused on the analysis of risk and vulnerability (Alayande, 2003; Adubi et al., 2002, Okunmadewa and Elder, 2003; Olaniyan et al, 2003). While several studies describe the sources of risk, others have focused on the intent to capture various aspects of risks, vulnerability to shocks and poverty dynamics. The dynamics of poverty is often linked to the incidence of risks, shocks, and vulnerabilities of individuals and households. Okunmadewa and Elder (2003) argued that risk and shocks lead to volatility of welfare due to consumption reduction. However, economic theory holds that households would always prefer smooth instead of volatile consumption. Christiansen et al. (2007) submitted that given access to well-functioning credit or insurance markets, these preferences generate stable consumption paths, even when shocks occur. But many African countries are such that credit and insurance markets are imperfect leading to a situation where household consumption may be susceptible to shocks (Fafchamps and Lund, 2003; Kazianga and Udry, 2006).

Risks are classified by the level at which they occur and by the nature of the event behind them. There are three sets of risks based on the level of occurrence; these are the micro, meso, and macro shocks (Fafschamp, 1999). Micro shocks are idiosyncratic in that they are individual or household level specific. Meso shocks affect groups of households that make up a community or village. Macro shocks occur at the national or international level. The other conventional approach to classifying shocks is the severity and frequency of shocks. The severity of shocks ranges from catastrophic (a

natural disaster, death of the breadwinner) to minor ones like a slight illness, a few days without work for casual labourers among others (Deaton 1991).

In the literature, shocks and risks are sometimes taken as synonymous. Exposure to risks usually results in shocks. The World Bank (2001) classified the different shocks into three categories: micro, meso and macro. While the micro is on the individual level, the meso and the macro correspond to the community and national/international levels respectively. Oni (2008) classified shocks in a way that is synonymous with the above as idiosyncratic (individual-based), community-based or national/international-based. Some types of risks identified within the broad categories are gender risks, unemployment, death illnesses, pollution, environmental degradation, natural disasters, conflict and wars as well as macroeconomic volatility. Heitzmann et al. (2002) categorized risks as natural risks (heavy rainfall, landslides, volcanic eruptions, earthquakes, floods, hurricanes, droughts, strong winds); health risks (illness, injury, accidents, disability, epidemics, malnutrition); economic risks (unemployment, harvest failure, output collapse, balance of payments shock, financial crisis, currency crisis, technological or trade-induced terms of trade shocks); life-cycle risks (birth, maternity, old-age, family break-up, death); social risks (crime, domestic violence, terrorism, gangs war, riots); political risks (discrimination, corruption, political unrest, coup d'état); and environmental risks (pollution, deforestation, land degradation, nuclear disaster). More specifically, there have been studies on risk involving price rigidity (Dorich, 2007), price increases (Wood et al., 2010), fluctuating economic cycles (Otrok, 1999), inflation (Fieding, 2004), conflict (Clemens and Moss, 2005), public policy reforms (Lucas, 2003; Suranovic, 2004), natural disasters/weather risks (Tatlock, 2006), and so on.

Oyekale and Oyekale (2010) using the National Living Standard Survey (NLSS) data of 2004, identified the different shocks that make rural households in Nigeria vulnerable to poverty. Some of them include job loss, drought, low agricultural prices, no credit to expand business, no land, high commodity prices, low salaries and hard economic times. These factors are responsible for increasing the poverty of the already poor and increasing the incidence of the non-poor falling into poverty. Oni and Yusuf (2008) showed that both idiosyncratic and covariate shocks lead to variability in consumption (as a measure of their vulnerability to poverty) of rural Nigerians. In the study, the covariate risk factors that make rural people

vulnerable include fluctuating weather conditions (since rural Nigeria is agrarian with dependence on rain-fed agriculture), volatility in government policies, unemployment, and AIDS and river blindness. The idiosyncratic factors include the low educational level/ no formal education, involvement in farming activities, large household size and having a female as the household head.

Chiwaula and Waibel (2009), on their work on the role of shocks and risks in the livelihoods of small-scale fishing communities of Hadejia-Nguru wetlands in Nigeria, reported three major classes of risk-weather shocks, agriculture-related shocks, and conflict/crime shocks. Weather-related shocks (drought and flooding) seem to be more prominent in the area as a result of the dry weather conditions. Ecology-related shocks (crop pests and diseases, *Typha* grass, destruction of housing, and livestock pests and diseases) are also very important in the area. The study also found that security-related shocks (conflict with the nomadic Fulani, theft of livestock, theft of equipment, theft of cash and forced migration) have high prevalence rates.

Literature abounds on the welfare consequences of the different risks that individuals, communities and the nation are exposed to. The welfare costs of exposure to risk are most often measured in terms of cost to consumption and or income. However, given the microeconomic theory assumption that all income is spent on consumption, the welfare cost can either be measured as a loss in consumption or income. Following Lucas' approach (Lucas, 2003) in measuring the costs of economic fluctuations, the welfare cost of risks/shocks is given as that proportion of the present level of consumption that people are ready to permanently give up a proportion of in order to reduce the uncertainty of variability in consumption in future. The magnitude of these costs is however dependent on the consumer's preference and risk aversion attitude. Otrok (1999) states that the welfare cost of consumption is the percentage of consumption that an agent would pay at every date and state to move from the fluctuating economy to a non-fluctuating economy. However, other non-economic welfare costs have been cited in the literature, including loss of lives, malnutrition, infant mortality, and low educational attainment (Tesliuc and Lindert, 2002; Clemens and Moss, 2005).

With respect to the risks arising from macroeconomic variables in developing countries, Loayza et al. (2007) concluded that the volatility experienced in terms of large external shocks, macroeconomic rigidities, and weak institutions constitute direct welfare costs to risk averse individuals as well as indirect costs to others through its adverse effect on growth and development. High risk aversion could also be the cause of very stringent consumption smoothing in risk averse individuals as noticed in small welfare costs during the risk periods. Chetty and Looney (2004) suggest that many households in low-income countries resort to costly consumption smoothing measures such as subsistence constraints in response to risks, because of their high risk aversion rather than invest in insurance. With regard to another macroeconomic shock, in this case, an increase in import tariffs, welfare cost to the consumers in the importing countries is quite high resulting from the increased cost of the imported product, especially for a country largely dependent on imports. However, in the exporting country, the welfare loss will be borne by the producers as a result of the loss of revenue from the importing country and a decrease in the prices of their products in their own domestic economy (Suranovic, 2004). In estimating the welfare cost of a 17.5% increase in domestic fuel tax in the United Kingdom, which corresponds to sales taxes, Blundell (1996) found that losses were up to 2% of the total household consumption of the respondents studied.

Olomola (2006) found that the welfare effects of foreign shocks and oil price shocks on the economic performance of Nigeria are, to a very large extent, based on the response of the domestic macroeconomic policies to such external shocks. Thus, output growth in Nigeria is affected by the domestic money supply and price shocks. In analysing the non-monetary cause of inflation volatility in Nigeria, Fielding (2004) found that infrastructure such as transportation, literacy, and communication are able to reduce inflation volatility while increased access to credit increased the inflation volatility.

In assessing the welfare costs of conflicts, Hess (2004) states that war, at any level, leads to welfare losses both in economic and non-economic facets. In the non-economic facets are the loss of lives and loss of family/friends. Basing the measure of the economic welfare cost on Lucas' (1987) approach, he found that people were ready to permanently give up 8% of their current consumption levels to avoid a war. In sub-Saharan Africa, Barry and Quentin (2007) reported that the cycle of conflicts and

political instability in Guinea Bissau have led to loss of human lives, loss of investment growth as well as any attempt at poverty reduction. The study revealed that about 40% of GDP was lost as a result of the 11 months of civil war in 1998. Also, one in three persons living in poverty today in the country would not have been poor but for the conflict. Barro (2006) posits that the welfare cost of disasters, including wars, are large and could mean that people are willing to reduce 20% of their GDP to prevent the uncertainty of any such macroeconomic disaster. He, however, thinks that the welfare cost of economic fluctuation is lower with a reduction of GDP by 1.5% to reduce the uncertainty.

Agriculture and weather-related shocks also carry welfare implications. Rainfall data, for instance, have been extensively used to identify the effect of weather shocks on agricultural yields and incomes (Porter, 2008). Other detrimental weather effects have been documented, such as long-term effects on school attendance and enrolment (Jacoby and Skou, 1997), the nutrition and height of children (Alderman, Hoddinott and Kinsey, 2006), and their ultimate educational attainment (Portner 2008). Reporting on the cost of water stress in sub-Saharan African countries, Tatlock (2006) reported that water stress is predominant and expected to increase as a result of the low-level infrastructural base to harness the available water bodies, unlike their counterparts in South Africa and Egypt. According to the report, water stress causes both a decline in economic development and some conflict in transboundary water bodies, both with negative welfare impacts. He also reported that in Kenya, the 1999-2000 droughts produced a 16% decline in the GDP. In a related issue, Moran (2006) gave the example of Niger as a country languishing in a food crisis as a result of cyclical floods and a non-responsive and corrupt political system.

Alayande (2004) observed that Nigeria is bedevilled with major environmental hazards that have adversely affected the earning capacity of the people, especially in rural areas. The major environmental problems that have made Nigerians, especially rural dwellers, vulnerable to poverty are: drought and desertification; agricultural land degradation; and high incidence of gully, coastal and marine erosion. Large industrial pollution and urban waste are other environmental problems that have seriously affected the health of the people and hence their income-earning capacity. The fact that Nigeria is predominantly rural based and dependent on agriculture which relies on unpredictable weather conditions is a major risk

factor (Oni and Yusuf, 2008; Oyekale and Oyekale, 2010), making the majority of Nigerians vulnerable to poverty and causing a decline in wellbeing.

The mere existence of risk does not generate adverse outcomes as this depends on the risk management options that are utilised. Two sets of strategies are at the disposal of the household for the purpose of coping with risks to which they are prone; these are formal and informal strategies. Informal strategies are individual or household based, while formal strategies are market-based activities as well as publicly provided mechanisms for the poor to mitigate the attendant effects of risks. Both sets of strategies are supposed to be complementary, given the magnitude of the vulnerability of the poor to poverty-associated risks. For example, those working in the informal sector may be vulnerable, even when they are not poor, because they lack any sort of safety net to protect them if they lose their jobs.

Holzmann and Jørgensen (2000) however identified that it is possible to separate risk management into *ex ante* and *ex post* strategies. *Ex ante* risk management can be classified into three types of strategies. First is risk prevention or reduction, which are actions taken to eliminate or reduce the occurrence of risky events. The second is the prevention or reduction of exposure to risk. This strategy focuses on the fact that even if the risks exist, the strategies must ensure actions take place to prevent or reduce exposure to such risks. The third is risk mitigation – actions that can be taken *ex ante* to provide compensation in the case of a risk-generated loss. Some of these risk management strategies, as implemented in Nigeria, have been provided in Olaniyan et al. (2003). Ex post risk management on its own includes response actions taken after a risk has occurred. It involves activities to deal with realized (or actual) losses, such as the selling of assets, seeking "emergency" loans (from relatives, friends, banks), removing children from school, migration, seeking temporary employment.

Within the broad risk management options, the capacities of individuals, households, and communities to handle risks and their choice of risk management instruments depend on the characteristics of those risks (their sources, correlation, intensity, and frequency) and the portfolio of assets that the individuals, households, and communities control (Jalan and Ravallion, 2000). De Ferranti et al. (2000) further argued that efficient risk

management must involve a combination of the three strategies for (i) risk prevention; (ii) risk mitigation by pooling uncorrelated risks or sources of income or by making use of formal and informal insurance; and (iii) coping strategies designed to relieve the impact of the risk once it has occurred. Within each of the risk management instruments, some of them will fall into informal arrangements while others fall into market-based arrangements and the rest are those that will be within public arrangements usually as some form of social protection.

Oni (2008) identified three strategies in risk management in Nigeria: prevention, mitigation, and coping strategies. Risk prevention includes measures that reduce the probability of welfare reduction through risks; examples include immunization, irrigation, education, land agreement, and so on. Risk mitigation, on the one hand, involves strategies to reduce the impact of the welfare-reducing risk and it includes issues like insurance, price support, portfolio diversification, intercropping, mixed cropping and mixed farming. On the other hand, coping mechanisms are put in place to relieve the impact of a risk event that has occurred. Such measures include a reduction in consumption, sale of assets, school dropout and borrowing. However, as implied in Oni and Yusuf (2008), policy measures in risk and vulnerability management should be region-specific since there are differing levels of risk factors and risk exposure in the different regions of Nigeria.

The level of intervention in risk management, as well as the level of formality, determines the composition of the actors within the management strategy. Heitzman et al. (2002) identified intervention levels as micro, meso, macro and global, while there are formal and informal intervention practices. In all, the major actors in any risk management strategy are the households, NGOs, the private sector, the public sector, donors or international organizations, that are either exposed to risks that have to be managed and/or provide the management strategies to manage the risks.

Analytical Framework

Prevalence of risks

Risk profiles of the country were done using graphical analyses. Bar chats were used to describe the incidence of identified risks. Due to the high number of risk exposure observed in the population, the study took a

further step to bunch them into groups. Factor analysis was used to achieve this task.

Factor analysis was used to reduce some risk variables to a few manageable ones, especially those related to shocks. This method has the advantage of reducing multicollinearity among variables, reducing some dummy variables to single continuous and bringing down the number of variables to a level that can be reasonably handled. Factor analysis works by extracting variables (factors) that capture essential variability in the original variables thus making it a linear combination of all the variables. Given that death of the household head, conflicts in the community, death of a spouse, the household head being away, spouse away from home, household head hospitalized and personal theft were high-incidence reported risks, this however still makes the explanation of risks affecting households in Nigeria ambiguous. Therefore there is a need to explore a robust way of categorizing risks based on their correlation structure. Factor analysis will help bunch up risks that affect the population in a similar way into the same category. Therefore we were able to re-categorize risks based on their correlation structure to security risk, social risks, life-cycle risks, and health risks. Moreover, the key risks identified using factor analysis were further profiled graphically using relative incidence measures.

To examine the set of people most affected by the isolated risks in the population, this study examined the incidence of reported shocks based on household characteristics as well as regional differences. The household characteristics used include: gender of household head, poverty status, and age and educational level of the household head. Location characteristics include sector (urban and rural dwelling) and region (North-east, North-west, North-central, South-east, South-west, and South-south). The relative incidence is the ratio of the incidence of the risks on a particular population relative to its country-wide incidence (Tesluic and Lindert, 2000). If the relative incidence of risks reported is lower than 1, this implies that the occurrence of the risk is lower than the national average, whereas if it is higher than 1, it implies that the occurrence is greater than the national average.

Probability of reporting risks

The probability of a household reporting a shock based on the household and location characteristics is examined in this section.

Multivariate logistic regression was used in the study to identify significant predictors of exposure to risks in the country. The model also attempted to determine the effect of the set of explanatory variables on the probability of reporting identified risks while holding the other predictor variables constant. The predictors used in the model include: economic status (wealth factor - which is determined by assets owned by the household and poverty status), exogenous household characteristics (gender, age, educational level of the head) and location characteristic (sector- urban/rural and regions within the country). The dependent variables used were risks such as household experiencing the death of household head, household experiencing the death of a spouse, household head and spouse away from home, disability of household head, household head and spouse hospitalized, home burglary, physical harm, motorcycle and vehicle theft and community conflict.

Estimation of the cost of welfare on risks

The associated welfare loss due to exposure to shocks were quantified. In order to determine the monetary values of welfare losses associated with shock, the approach of Tesliuc and Lindert (2002) was adopted. It was noted that shocks lead to a reduction in income or expenditure, but the ability to mitigate their impacts will minimize their impacts. It was assumed that mitigation ability will be determined by a household's wealth and varies from zone to zone. The equation to be estimated can be expressed as:

$$C_s = X_h\beta_i + \mu_i R_h + \alpha_i S_h W_h + \lambda_i S_h R_h W_h + e_s \quad (1)$$

The level of consumption without shock can be estimated as:

$$C_w = X_h\beta_i + \mu_i R_h + e_w \quad (2)$$

Cost of welfare shock, i.e. the impact of shock, can be regarded as $C_s - C_w$

where:

X_h represents the households' socio-economic characteristics such as household size (number of children and gender, age), human capital

characteristics (educational level of the household head), number of spouses, number of kids between 0-4 years, number of kids between 5-9 years, number of kids between 10-17 years, poverty status

R_h is a vector of regional dummies such as geopolitical zones (North-East, North-West, South-East, South-South, South-West);

S is the vector of the shock dummies (e.g., death of household head, death of spouse, community conflict);

W is household wealth. If this specification is correct, then the level of consumption can be estimated in the absence of shocks simply by replacing all the indicator variables for shocks with zeroes.

β_i, μ_i, a_i and λ_i are the respective parameters to be estimated

e are error terms of the models.

Results generated will provide information on the impact of shocks on income and consumption by the economic status of the household and overall impact of shocks on aggregate welfare (using per capita consumption expenditure as a proxy for aggregate welfare). OLS regression using semi-log function was used for the analysis.

Risk management options

A social risk management matrix was used, following Holzmann (2001), to describe the risk management options adopted by the population. Descriptive statistics of percentage and frequency were used to describe the relative usage of various risk management options. Responses to risks can be categorized as risk coping, risk mitigation, and risk reduction. Strategies in responses to risks can be classified into three: informal, market based and public arrangements. The informal arrangements involve responses that do not have a bearing on market forces or connection with government interventions. They are arrangements made at the idiosyncratic levels. Such include selling of real assets, informal social groups, migration, marriages, less-risky productions, personal hygiene, and shared tenancy. The market-based strategies include the sale of financial assets, insurance, labour standards and borrowing from financial institutions. The public strategies emanate from the government and include pension schemes, public works, subsidies, health interventions, macroeconomic policies, labour laws and protection of property rights.

Data and descriptive statistics

This study utilised data from the Harmonised Nigeria Living Standard Survey (HNLSS) of households that were collected between 2009 and 2010 by the National Bureau of Statistics (NBS). The sample design was two-stage stratified sampling. The survey covered all 36 states of the federation and the Federal Capital Territory (FCT). The sample studied for the Harmonised Nigeria Living Standard was designed to have the LGA as a reporting domain. However, the sample design for the survey also facilitated the provision of estimates at national and sub-national levels (national, zonal, and state). The sampling frame for all the 774 LGAs in the country used the enumeration areas (EAs) demarcated by the National Population Commission (NPopC) for the 2006 Housing and Population Census. The frame was constructed into replicates such that each LGA had 3 replicates and in each replicate there were 10 EAs serially numbered 01-10. A complete listing of housing units and households was carried out in each of the EAs just before the start of the main survey.

A two-stage sample design was adopted in the survey of which selection of EAs constituted the first stage/Primary Sampling Units (PSUs), while a selection of households (HHs) formed the second stage/Secondary or Ultimate Sampling Units (USUs). The welfare approach, also known as Part A component, was conducted in 77,400 households, which gives an average of one hundred households per local government area, while the consumption approach (Part B) covered 50 households in each local government (NBS, 2010). In all, the empirical analysis made use of 27,747 households.

The survey enquired about household expenditure, income sources, health, education, social capital, employment issues and experience of shocks and their coping methods. The descriptive statistics from Table 1 show that a typical household in Nigeria has an equivalent adult member size of 3.4, about 1 kid between 10-17 ages, and about 84 percent male head, 84 percent married and monogamous, with age around 48 years and the majority have no formal education. Based on the national moderate (₦88,693.46) and core (₦44,346.73) poverty lines per annum computed by the Nigerian Bureau of Statistics, using HNLSS 2009/2010 data, about 48.5 percent and 28.4 percent of Nigerian households could be described as

extremely poor and moderately poor respectively, with about 71 percent residing in rural areas.

Empirical Results

Prevalent risks

Findings reveal in Figure 1 that the prevalent shocks are the death of the household head, conflicts in the community, death of a spouse, the household head being away, spouse away from home, household head hospitalized and personal theft. The shocks with the lowest incidence according to findings are spouse disability, car vandalism, and vehicle theft at 0.8%, 1.2%, and 1.4% of the population respectively. These shocks are idiosyncratic in nature. The shocks are felt by a few of the sample units.

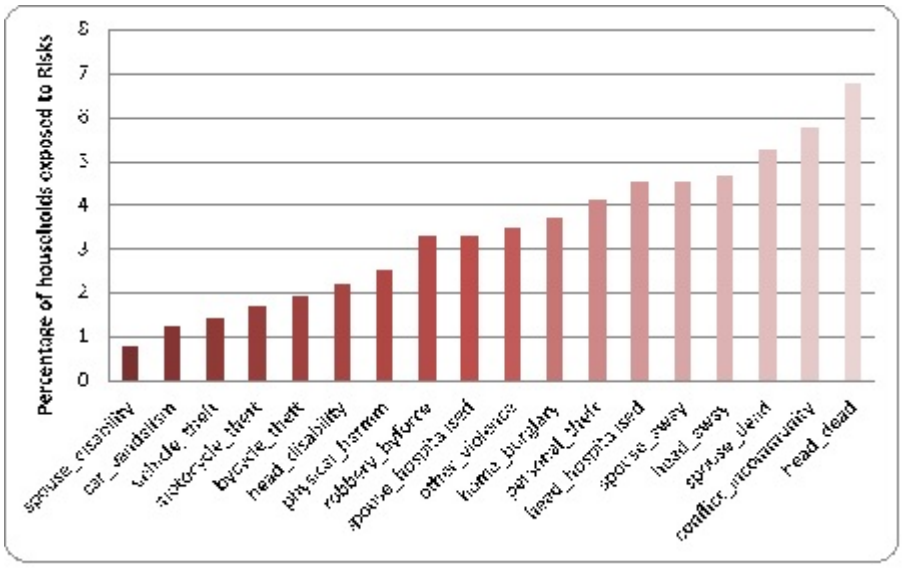

Figure 1: Incidence of reported shocks in Nigeria, 2009-2010.

Grouping of risks using factor analysis is shown in Table 1. The result shows that there are eight bunched risks affecting households in Nigeria. Six factors are uniquely identified through factor 1 to factor 6 based on their correlations with shocks. However, these six factors can be summed up into four categories: security risk, social risks, life-cycle risks, and health risks. As highlighted in Table 2, factor1 identifies the security risks (vehicle

theft, car vandalism, motorcycle theft, bicycle theft, home burglary, robbery by force, personal theft, physical harm, and other violence), factor 2 and 3 depict life-cycle risks (death of household head, death of spouse, head away, and spouse away), factor 4 represents the social risk (community conflict), and factor 5 and 6 identify health risks (household head disabled, spouse disabled, and household head hospitalized and spouse hospitalized).

Table 1: Summary statistics of rural households in Nigeria

Variable	Type	Mean	Std. Dev.	Min	Max
Per capita expenditure	Continuous	410692.5	1.80E+07	1573.189	2.01E+09
Poverty status (Non-poor as default)					
Moderate poor	Dummy	0.284		0.000	1.000
Extreme poor	Dummy	0.485		0.000	1.000
Household size	Continuous	3.398	1.944	0.660	9.610
Household head's age	Continuous	47.865	16.200	15.000	95.000
Heads' education (No formal as default)					
Head with primary education	Dummy	0.241		0.000	1.000
Head with secondary education	Dummy	0.176		0.000	1.000
Head with post sec. education	Dummy	0.082		0.000	1.000
Head with tertiary education	Dummy	0.043		0.000	1.000
Male head	Dummy	0.845		0.000	1.000
Marital status (Never married as default)					
Head married monogamy	Dummy	0.837		0.000	1.000
Head married polygamy	Dummy	0.009		0.000	1.000
No. of kids between 05-09 yrs	Continuous	0.501	0.803	0.000	8.000
No. of kids between 10-17 yrs	Continuous	0.825	1.120	0.000	8.000
Wealth Index (PCA)	Continuous	0.054	2.499	-2.481	15.802
Number of spouse	Continuous	0.864	0.672	0.000	7.000
Rural	Dummy	0.713		0.000	1.000
Geopolitical zones (North Central)					
North East	Dummy	0.124		0.000	1.000
North West	Dummy	0.228		0.000	1.000
South East	Dummy	0.154		0.000	1.000
South South	Dummy	0.101		0.000	1.000
South West	Dummy	0.204		0.000	1.000

Source: HNLSS 2009/2010 data
Sample size: 27,747

Table 2: Factor loadings (pattern matrix) and unique variances

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Uniqueness
Vehicle theft	0.8055	-0.0018	0.0049	-0.2276	0.1223	-0.02	-0.0377	0.0468	0.2803
Car vandalism	0.8561	-0.0067	0.0002	-0.192	0.1057	-0.017	-0.0147	0.0469	0.2163
Motorcycle theft	0.7965	0.01	-0.0081	-0.0949	0.0547	-0.0212	0.0718	-0.0675	0.3432
Bicycle theft	0.7232	-0.0072	-0.0015	-0.0542	0.0295	-0.0085	0.021	-0.0291	0.4717
Home burglary	0.6214	0.0109	-0.0016	0.0881	-0.0337	0.0237	-0.0025	-0.0862	0.5968
Robbery by force	0.642	0.0124	0.0065	0.1439	-0.1214	0.055	-0.1405	0.0141	0.5292
Personal theft	0.5785	-0.0011	0.0009	0.1526	-0.123	0.051	-0.1314	0.0333	0.6059
Physical harm	0.7315	-0.0032	0.0116	0.1625	-0.0934	0.0066	0.0559	0.0033	0.4265
Other violence	0.5934	0.0048	0.0068	0.1655	-0.0333	-0.0499	0.1534	0.029	0.5924
Conflict in-community	0.0472	0.0067	0.0078	0.1629	0.0093	-0.0583	0.1399	0.0564	0.9449
Household head dead	-0.0084	0.7985	-0.0449	-0.0026	0.0037	-0.0004	-0.0019	-0.001	0.3603
Household head away	-0.012	0.0252	0.7597	-0.0091	-0.0123	-0.0057	0.0011	0.0029	0.4219
Spouse dead	-0.0039	0.7871	-0.0603	-0.0096	-0.0114	-0.0002	0.0028	0.0031	0.3766
Spouse away	-0.0064	0.084	0.7591	-0.0054	0.0023	0.0023	-0.0014	-0.005	0.4167
Spouse disable	0.0116	0.0002	0.0139	0.043	0.1295	0.2413	0.0411	0.0089	0.9211
Household head disabled	-0.0015	0.0094	0.0054	0.0332	0.1237	0.2448	0.0445	0.0041	0.9215
Household head hospitalised	-0.0014	0.0076	0.0143	0.1954	0.2734	-0.0722	-0.0548	-0.006	0.8786
Spouse hospitalised	0.0102	0.0185	0.0098	0.1858	0.2692	-0.0854	-0.0686	-0.009	0.8804

Source: Authors' computation from the HNLSS 2009 data.

Relative incidence of reported shocks by household and location characteristics

Figure 2 (a-f) illustrates the relative incidence of the risks. Following from results presented in Figure 1, the risk with the highest incidence of occurrence countrywide is the death of the household head at 6.8%. With respect to the gender of the household head, it is observed that the relative incidence of experiencing the shock of the death of a household head is 0.6 for female-headed households and 0.8 for male-headed households. This reveals that when compared to the national incidence, the relative incidence of this shock was 20% and 40% lower than the country incidence for male and female-headed households respectively. The incidence of this shock was 1.3 for extremely poor households and 1.02 and 0.6 for the moderately poor and non-poor respectively. The implication of this result is that the extreme poor are the most exposed on the instance of the death of the head of the household relative to the national average followed by the moderately poor and then the non-poor.

The sectoral difference in the relative incidence of experiencing shocks is presented in Figure 2e. The incidence of experiencing the death of the household head is 1.04 for rural households and 0.88 for urban households, with a relative incidence of 4 percent higher and 16 percent lower for the rural and urban sectors respectively. This implies that rural households are more exposed to the death of household heads relative to the national average than urban households. Female-headed households are less exposed to shocks compared to male-headed households.

Therefore, the extremely poor are worse off in terms of security and life-cycle risks. As regards age, households with heads aged 60 and above are worse off in terms of shocks such as spouse and head disabilities. Households with heads aged between 25 and 59 are more vulnerable to shocks such as spouse deceased, head deceased, robbery by force and home burglary. Therefore the aged are more prone to health risks, while the active working age groups are prone to security and life-cycle shocks/risks.

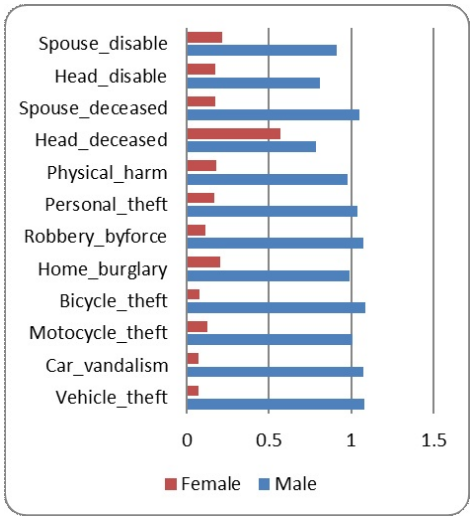

Figure 2a: Relative incidence by gender.

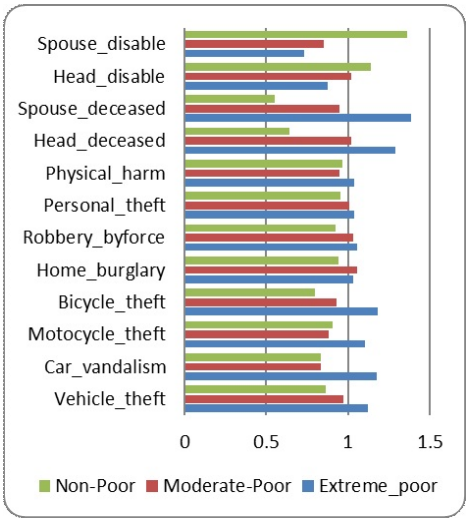

Figure 2b: Relative incidence by poverty status

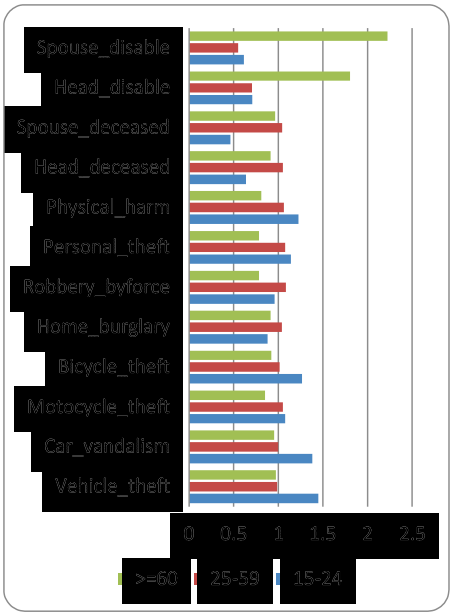

Figure 2c: Relative incidence by age of household head.

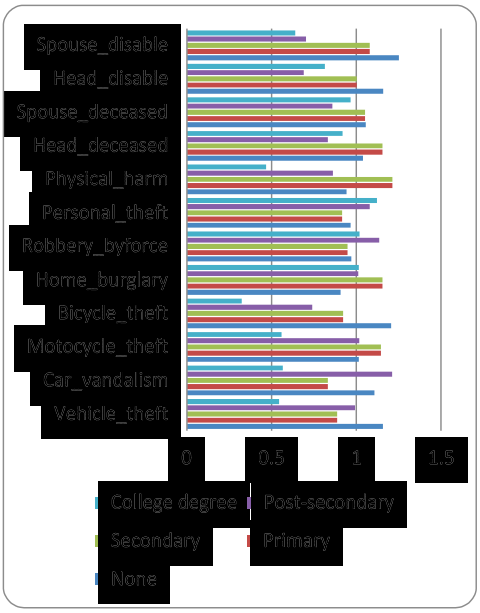

Figure 2d: Relative incidence by educational level of household head.

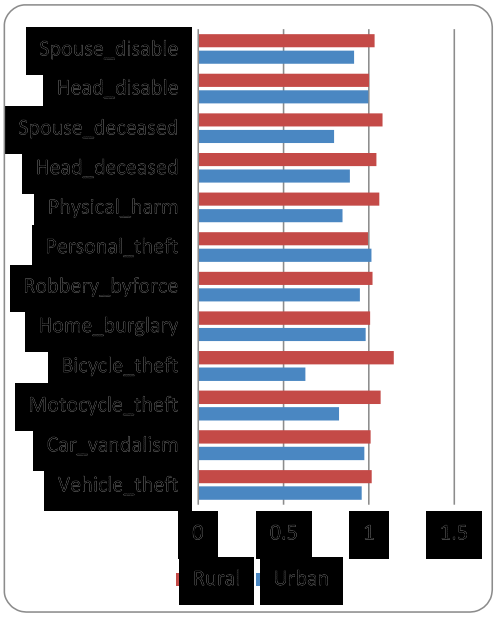

Figure 2e: Relative incidence by sector.

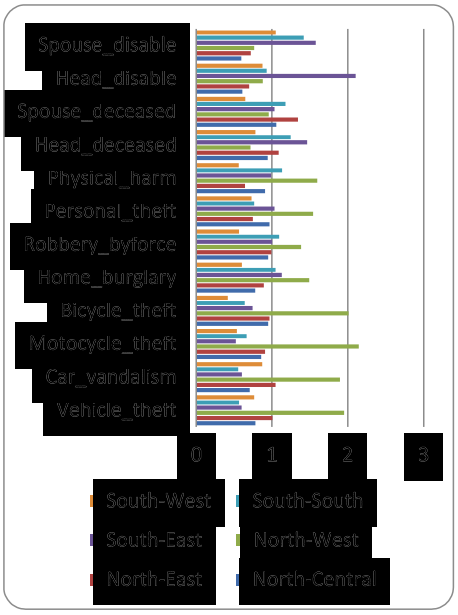

Figure 2f: Relative incidence by region.

Figure 2: Relative incidence of risks by household and location characteristics.

Rural households are worse off in terms of life cycle, health, and security risks than urban households. Further, the results show that the north western part of Nigeria is the worst in terms of security risk. The south eastern part of Nigeria experienced more health and life-cycle risks relative to national incidence. Therefore, households in the south eastern part of Nigeria are more vulnerable to health and life-cycle risks than those in any other geopolitical zones in Nigeria. The results further reveal that the south western and north central geopolitical zones are less exposed to risks compared to the North western, North eastern, South eastern and South-south geopolitical zones of Nigeria.

Probability of reporting shocks

The diagnostic statistics of the result in Table 3 show that the models fitted for the probability of reporting shocks are statistically significant. Therefore, holding other variables constant, moderately poor households are

more likely to report a shock of death of household head or head away than non-poor households, while non-poor households are more likely to report the shock of household head hospitalized or spouse hospitalized. The level of wealth appears to significantly influence the probability of reporting disability of household head, home burglary, physical harm, vehicle theft, and community conflicts.

Rural dwellers have a higher probability than urban dwellers of experiencing shocks related to death of spouse, hospitalization of household head or spouse(life-cycle and health risks), while the urban households have a higher tendency of reporting that the household head is away from home or that there is conflict in their community(social and life-cycle risks). Residents of the North western zone of Nigeria have a higher probability of experiencing security risk than any other region in the country. In explicit terms, the North western zone has the highest probability of reporting a home burglary, physical harm, motorcycle theft, vehicle theft and conflict, thus making it the least secure zone in the country. The South eastern part of Nigeria has the highest probability of reporting conflict, household head dead, head and spouse away from home and head and spouse hospitalized than any other geopolitical zone in Nigeria. The South-south geopolitical zone has the highest probability of experiencing shock such as head disability (health risk) more than any other geopolitical zone of Nigeria.

Educational level attainment significantly influences shocks reported by households. Household heads who have primary education only have the highest likelihood of reporting shocks like home burglary, physical harm and vehicle theft than household heads who have higher educational attainment. This implies that the lower the educational attainment, the higher the likelihood of facing security risk.

Large households have a higher likelihood of reporting hospitalization of head of household/spouse as well as home burglary, motorcycle theft, spouse death, household head disabled and conflict in the community than smaller households (security, health, social and life-cycle risks). Households with older household heads have a higher probability of reporting death of spouse, and absence of head/spouse (life-cycle risk). It is important to note that, the number of children and spouses in a household significantly influences life cycle shocks reported in households.

Table 3: Probability of Reporting Shocks; Reporting Odd Ratios

	Head_dead	Spouse_dead	Head_away	Sp_Away	Head_Disbld	H_Hosptlsd	Sp_Hospitalised	Home_Burglary	Physicalharm	Cycletheft	vehicletheft	Conflict
Wealth	1.012	1.029*	1.035*	1.03*	0.925**	0.998	1.026	1.044**	0.962*	0.984	1.061*	1.023*
	-0.013	-0.015	-0.016	-0.016	-0.023	-0.015	-0.174	-0.017	-0.021	-0.026	-0.028	-0.013
Moderate poor	0.955	0.875***	0.935*	1.158	0.972	1.693***	1.762***	1.077	0.971	0.953	0.955	1.065
	-0.078	-0.08	-0.092	-0.114	-0.152	-0.201	-0.204	-0.114	-0.127	-0.155	-0.16	-0.094
Non poor	0.618***	0.585*	0.635***	0.952	1.424**	3.775***	2.392***	1.004	0.979	1.149	0.88	1.157*
	-0.043	-0.046	-0.051	-0.075	-0.157	-0.324	-0.216	-0.838	-0.098	-0.136	-0.114	-0.079
North East	1.119	1.15	0.73*	0.907	1.381*	1.466*	1.175	1.351*	0.784	1.175	1.266	0.881
	-0.1	-0.107	-0.102	-0.123	-0.259	-0.225	-0.193	-0.174	-0.13	-0.214	-0.248	-0.095
North West	0.771**	0.823*	1.051	1.19	1.373*	1.959***	1.948***	2.327***	2.064***	2.868***	2.433***	0.73**
	-0.066	-0.718	-0.164	-0.131	-0.226	-0.254	-0.253	-0.242	-0.241	-0.396	-0.378	-0.07
South East	1.38***	1.071	1.884***	2.572***	1.856***	3.677***	3.308***	1.355*	0.982	0.472***	0.74	1.990***
	-0.116	-0.104	-0.203	-0.28	-0.295	-0.451	-0.433	-0.161	-0.141	-0.981	-0.165	-0.175
South South	0.992	1.12	1.817***	1.9***	2.166***	3.028***	2.656***	1.064	1.084	0.613*	0.71	1.663***
	-0.099	-0.122	-0.219	-0.242	-0.376	-0.403	-0.378	-0.146	-0.166	-0.135	-0.181	-0.161
South West	0.896	0.809*	1.504***	1.563***	1.431*	2.034***	1.272	0.714*	0.612**	0.6**	0.96	1.025
	-0.082	-0.084	-0.164	-0.178	-0.234	-0.261	-0.187	-0.093	-0.095	-0.114	-0.184	0.955
Rural Comm.	1.114	1.156*	0.828*	0.913	0.999	1.203*	1.175*	0.952	1.008	1.05	0.889	0.888*
	-0.075	-0.088	-0.062	-0.07	-0.112	-0.948	-0.108	-0.08	-0.105	-0.132	-0.118	-0.059
Primary Education	1.097	0.992	1.049	0.911	1.034	0.893	1.645***	1.438***	1.522***	1.715***	0.911	1.131*
	-0.073	-0.753	-0.848	-0.074	-0.117	-0.072	-0.152	-0.124	-0.155	-0.207	-0.128	-0.816
Secondary Educatn	0.923	0.914	0.849	0.658***	0.626*	0.726**	1.023	1.342**	1.427**	1.416*	0.835	1.031
	-0.079	-0.085	-0.092	-0.074	-0.113	-0.078	-0.123	-0.142	-0.178	-0.218	-0.141	-0.898
PostSecondary Edu	0.919	0.901	0.948	0.844	0.946	0.655**	1.036	1.2	1.227	1.513*	0.919	1.128

	Head_dead	Spouse_dead	Head_away	Sp_Away	Head_Disbld	H_Hosptlsd	Sp_Hospitalised	Home_Burglary	Physicalharm	Cycletheft	vehicletheft	Conflict
	-0.167	-0.108	-0.127	-0.113	-0.186	-0.091	-0.157	-0.162	-0.206	-0.286	-0.189	-0.12
College Degree	1.136	1.011	0.833	0.807	0.843	0.659*	0.648*	1.187	0.737	1.006	0.473*	0.999
	-0.167	-0.162	-0.16	-0.147	-0.24	-0.116	-0.143	-0.217	-0.217	-0.327	-0.169	-0.142
Household Size	1.034	1.047*	0.510***	0.536***	1.034	1.135***	1.106**	1.089**	1.034	1.093*	0.983	1.065**
	-0.024	-0.26	-0.024	-0.024	-0.038	-0.317	-0.353	-0.311	-0.391	-0.466	-0.05	-0.255
HH.Age (years)	0.997	1.008***	1.03***	1.039***	1.038***	1.001	0.995*	1.002	0.995*	1.002	1.001	0.996*
	-0.002	-0.002	-0.002	0	-0.003	-0.002	-0.003	-0.002	-0.003	0	-0.004	0
Male Headed HH	0.277***	1.448***	0.288***	1.071	1.636***	0.62***	1.394**	0.657***	0.634***	0.452***	1.102	0.983
	-0.022	-0.151	-0.027	-0.103	-0.212	-0.055	-0.17	-0.07	-0.08	-0.071	-0.216	-0.084
No. of Spouse	0.853**	0.754***	1.18*	0.949	0.696***	0.82**	1.085	1.02	1.006	1.136	1.143	1.038
	-0.05	-0.046	-0.995	-0.077	-0.069	-0.062	-0.839	-0.07	-0.087	-0.105	-0.12	-0.625
Children btw 1-4yr	1.125***	1.08*	2.91***	2.597***	0.779**	0.764***	0.961	0.943	0.961	0.864*	0.998	0.920*
	-0.039	-0.04	-0.166	-0.145	-0.061	-0.041	-0.049	-0.042	-0.054	-0.056	-0.072	-0.364
Children btw 5-9yr	0.979***	0.971	2.728***	2.392***	0.860*	0.983	0.92	0.918*	0.870*	0.97	1.043	0.914*
	-0.041	-0.428	-0.167	-0.145	-0.077	-0.054	-0.052	-0.045	-0.055	-0.067	-0.808	-0.04
Children_10-17yr	1.545**	1.417***	3.197***	3.188***	0.934	0.951	0.964	0.906*	0.93	0.887*	0.936	0.944
	-0.049	-0.478	-0.18	-0.175	-0.057	-0.043	-0.046	-0.039	-0.052	-0.056	-0.068	-0.034
Prob > chi2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Observations	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**	**27747**
Pseudo-R^2	**9.5%**	**9.5%**	**15.5%**	**12.8%**	**8.5%**	**8.6%**	**4.8%**	**2%**	**2.3%**	**4.5%**	**2.6%**	**2.2%**

Standard errors in parentheses; *; ** , *** 10%, 5% and 1% level of significance respectively

Wealth Index is a composite of the asset base of the responding households.

Welfare costs of risk

The result of the estimated models for the welfare cost of risks is depicted in Table 3. Based on the diagnostic statistics, the models have a good fit. Table 4 shows that the death and absence of the household head has a negative impact on the consumption level (welfare) of the affected rural household. Therefore, life-cycle risks are important factors reducing rural households' welfare in Nigeria. Similarly, the death of the head in an urban households has significant negative effect on the household's consumption level.

Table 4: Welfare costs of risks (Impacts of Risks) in Nigeria

Dependent Variables (Per capita expenditure)	Coefficient (Rural Households)	Coefficient (Urban Households)	Coefficients (All Households)
Age of HH Head (years)	-0.000 (0.000)	0.000(0.000)	0.000(0.000)
Male head	0.058(0.020)**	0.035(0.013)**	0.035(0.011)**
Primary Education of HH head	0.013(0.0192)	0.019(0.009)*	0.0200(0.009)*
Secondary Education of HH head	0.016(0.0205)	0.009(0.012)	0.016(0.010)
Post-secondary Education of HH head	0.053(0.0231)*	0.039(0.017)*	0.051(0.013)***
College degree of HH head	0.077(0.028)**	0.046(0.026)*	0.066(0.018)***
Moderately poor	0.531(0.021)***	0.650(0.012)***	0.618(0.010)***
Extremely poor	1.279(0.016)***	1.356(0.009)***	1.343(0.008)***
Household size	-0.072(0.006)***	-0.603(0.004)***	-0.063(0.003)***
Number of spouses	-0.069(0.015)***	-0.019(0.008)	-0.032(0.007)***
Number of kids , 0-4 years	0.017(0.009)*	0.007(0.005)	0.009(0.005)*
Number of kids , 5-9 years	-0.104(0.011)	0.005(0.006)	0.001(0.005)
Number of kids , 10-17 years	0.010(0.009)	0.002(0.005)	0.004(0.005)
Dead of Household Head	-0.909(0.043)*	-0.055(0.024)*	-0.057(0.019)**
Wealth Index (WI)	0.023(0.006)***	0.019(0.005)***	0.017(0.003)***
Dead of Household Head* Wealth Index	0.0009(0.077)	-0.008(0.012)	-0.001(0.008)
Dead of Household Spouse	0.046(0.051)	0.012(0.026)	0.017(0.021)
Dead of Household Spouse* Wealth Index	-0.008(0.016)	-0.003(0.013)	-0.004(0.009)
Community Conflict	0.099(0.077)	0.009(0.039)	0.046(0.033)
North East	0.145(0.035)***	-0.003(0.014)	0.024(0.012)*
North West	0.109(0.026)***	-0.025(0.013)*	0.005(0.011)
South East	0.103(0.033)**	0.003(0.013)	0.013(0.012)

Dependent Variables (Per capita expenditure)	Coefficient (Rural Households)	Coefficient (Urban Households)	Coefficients (All Households)
South South	0.046(0.033)	-0.453(0.015)**	-0.036(0.013)**
South West	0.049(0.023)*	-0.028(0.015)*	0.008(0.011)
Community Conflict*North East	-0.176(0.153)	-0.021(0.064)	-0.056(0.056)
Community Conflict*North West	0.021(0.126)	0.072(0.059)	0.029(0.050))
Community Conflict*SE	-0.935(0.109)	0.040(0.049)	-0.003(0.043)
Community Conflict*SS	-0.197(0.114)*	-0.030(0.058)	-0.076(0.050)
Community Conflict*SW	-0.664(0.091)	-0.011(0.065)	-0.042(0.047)
Community Conflict*Wealth Index	-0.016(0.022)	-0.037(0.018)*	-0.018(0.012)
North East*Wealth Index	0.039(0.013)**	0.029(0.007)***	0.037(0.006)***
North West*Wealth Index	0.011(0.009)	0.026(0.007)***	0.028(0.005)***
South East*Wealth Index	-0.015(0.009)*	0.005(0.006)	0.003(0.004)
South South*Wealth Index	-0.016(0.009)*	0.010(0.007)	0.005(0.005)
South West*Wealth Index	0.007(0.007)	0.004(0.007)	0.013(0.004)**
Community Conflict*North East*WI	0.016(0.055)	0.024(0.029)	0.010(0.023)
Community Conflict*North West*WI	-0.002(0.044)	0.066(0.029)*	0.035(0.023)
Community Conflict*South East*WI	-0.007(0.032)	0.031(0.022)	0.005(0.016)
Community Conflict*South South*WI	0.036(0.031)	0.027(0.027)	0.022(0.018)
Community Conflict* South West *WI	0.002(0.027)	0.065(0.028)*	0.019(0.017)
Household head Away	-0.095(0.045)*	-0.009(0.026)	-0.010(0.021)
Household head away*Wealth Index	0.034(0.014)*	-0.022(0.0130	0.005(0.009)
Household Spouse away	0.069(0.048)	0.028(0.026)	0.026(0.021)
Household Spouse away*Wealth Index	-0.035(0.014)*	-0.001(0.013)	-0.019(0.008)
Household Head Hopitalised	0.125(0.035)***	0.119(0.019)***	0.122(0.016)***
Head Hospitalised* Wealth Index	-0.009(0.011)	-0.019(0.008)*	-0.016(0.006)*
Personal Theft	-0.032(0.046)	0.021(0.021)	-0.001(0.019)
Personal Theft*Wealth Index	-0.006(0.013)	0.014(0.009)	-0.000(0.007)
Home Burglary	0.019(0.047)	0.005(0.023)	0.018(0.019)
Home Burglary*Wealth Index	0.023(0.013)*	-0.000(0.010)	0.012(0.007)*
Robbery by force	-0.033(0.056)	-0.011(0.025)	-0.019(0.022)
Robbery by force*Wealth Index	-0.008(0.014)	-0.008(0.011)	-0.012(0.008)
Household Spouse Hospitalised	-0.013(0.045)	0.003(0.021)	-0.002(0.018)
Household Spouse Hospitalised*Wealth Index	0.001(0.013)	0.003(0.009)	0.001(0.007)
Other violence	-0.027(0.048)	-0.026(0.023)	-0.013(0.019)

Dependent Variables (Per capita expenditure)	Coefficient (Rural Households)	Coefficient (Urban Households)	Coefficients (All Households)
Other Violence*Wealth Index	0.022(0.014)	-0.006(0.011)	0.009(0.008)
Observations	**19793**	**7954**	**27747**
R-Square	**0.68**	**0.63**	**0.68**
Prob > F	**0**	**0**	**0**

Source: Computation from HNLSS 2009 data.

Note: Values quoted in parentheses are standard errors of the respective coefficients.

Community conflicts among rural households in the South-South zone had a negative effect on consumption levels of affected households. Interactions of shocks with the wealth index show that the absence of the household head and home burglary of wealthier households that reside in the rural North Eastern region had a positive impact on consumption. The implication of this result is that though the absence of the household head and burglary are supposed to reduce the consumption of affected rural households in the North eastern region of Nigeria, the wealthy status of affected households however more than compensated for the negative effects of the shocks. In the same vein, community conflicts among wealthy households in the North-West and South-West zones of Nigeria had a positive impact on consumption. This implies that the wealthy status of households in these regions more than compensated for the effect of community crises. Meanwhile, the absence of the household spouse from wealthy households in the rural South-East and South-South zones impacted consumption negatively. Likewise, in the urban sector, community conflicts, as well as illness and hospitalization of wealthy households, reduced consumption in the affected households.

In addition, a number of socioeconomic characteristics significantly contribute to the welfare of both rural and urban households as observed from the models.

Households' responses to risk exposure

Households' responses to risk exposure were categorised into coping, mitigating and reduction mechanisms. The HNLSS (2009) data sets contain a few of these household risk management strategies which were profiled using wealth quartile, sex of household head, sector, and region. As observed from the data, most households use a combination of strategies. As

presented in Table 5, four risk coping strategies (Self-help, Informal insurance, Public work, and Job loss/School absenteeism) were observed among the sampled households. Self-help is primarily from the sale of water owned by the household or fetched to sell to other households in order to cope with risk experienced. Informal insurance comes from membership in some form of social network such as cooperatives, religious groups, ethnic groups, and other such informal organizations.

Table 5: Main coping strategies

	Self Help	Informal Insurance	Public Works	Stop School/job
Wealth Level				
Poorest (1)	0.296	38.449	1.094	0.355
2	0.259	85.06	1.057	0.689
3	0.448	87.024	1.193	0.647
Richest(4)	0.125	89.808	2.033	0.605
Sex				
Male	0.567	85.886	1.369	0.542
Female	0.552	86.331	1.209	0.744
Sector				
Urban	0.96	86.12	1.207	4.652
Rural	0.405	85.889	1.399	6.164
Region				
North Central	0.391	88.221	1.645	0.416
North East	0.429	74.199	0.99	0.408
North West	0.381	81.476	1.409	0.348
South East	0.756	96.036	2.064	0.985
South South	0.857	87.871	1.109	1.181
South West	0.724	87.434	0.779	0.46

A number of households were involved in public works set up by government which pays some form of stipend in order to cope with the shock. Likewise, job loss/school absenteeism is a form of disinvestment in human capital. Some households cope with the shock of sick or hospitalized household members by leaving school or jobs. Of course, this is a form of

reduced consumption since there is a loss of revenue from the attendant job loss. Also, there is a loss in human capital from household members that have to leave school in order to give care. In all, the most adopted coping strategy is that of informal insurance which they derive from different social networks available to the households within their community.

Risk mitigation strategies are *ex post* measures taken to decrease the impact of risk in the event that it should occur. As shown in Table 6, the study identified the two major risk mitigation strategies used by households. These include health consultation and rehabilitation of physically challenged household members. Health consultation refers to the choice of different health care providers by households when faced with health risks. These include public health care services, professional healthcare services, community healthcare practices and traditional healthcare.

Table 6: Risk mitigation strategies

	Public Health	Professional Health Care	Community Health care	Traditional Health care	Rehabilitation
Wealth Level					
Poorest (1)	23.79	18.548	44.355	13.306	1.072
2	34.815	22.963	27.778	14.444	1.229
3	36.842	28.947	26.645	7.566	0.371
Richest (4)	35.689	34.275	22.261	7.774	0.797
Sex					
Male	34.974	25.518	28.368	11.14	0.8
Female	28.829	28.829	33.033	9.309	0.897
Sector					
Urban	37.168	29.204	23.304	10.324	0.575
Rural	31.332	25.326	32.637	10.705	0.924
Region					
North Central	46.316	25.264	15.789	12.632	0
North East	42.857	15.873	33.333	7.937	0
North West	46.199	11.111	30.994	11.696	0.568
South East	20.867	36.585	33.604	8.943	1.101
South South	29.012	21.605	37.654	11.728	1.515
South West	37.551	28.571	22.449	11.429	0.865

Risk reduction strategies are adopted to prevent or reduce the occurrence of a shock. As shown in Tables 7 and 8, health and security strategies are the two major risk reduction strategies utilized in Nigeria. Health risk reduction strategies involve protection against malaria using insecticide-treated nets, insecticides, window protection, prevention against HIV/AIDS as well as treatment of water. The security risk reduction measures identified were the use of police protection and neighbourhood watch in the community.

Table 7: Health Risk Reduction Strategies

	Protect Windows	Use Insecticides Treated Nets	Use Insecticides	HIV/AIDS prevention	Treatment of Water
Wealth Level					
Poorest (1)	4.903	27.029	75.146	76.084	12.226
2	9.407	25.888	76.519	81.406	13.845
3	18.753	28.036	76.879	83.791	15.518
Richest (4)	48.119	39.513	80.683	89.246	20.46
Sex					
Male	20.337	31.29	78.703	83.898	15.886
Female	20.014	23.756	69.665	75.616	13.565
Sector					
Urban	41.363	34.247	79.608	85.756	18.987
Rural	11.817	28.465	76.375	81.352	14.119
Region					
North Central	25.014	23.502	70.051	76.006	18.526
North East	11.473	39.953	80.256	86.488	8.885
North West	7.837	33.946	85.513	85.212	16.664
South East	14.239	23.763	72.226	88.084	10.958
South South	24.329	33.595	74.598	72.272	9.058
South West	37.699	29.15	78.283	84.531	21.919

Source: Computation from HNLSS 2009 Data.

Table 8: Security Risk Reduction Strategies

	Police in the community	Neighbourhood watch in community
Wealth Level		
Poorest (1)	33.381	17.337
2	39.419	19.797
3	48.570	20.477
Richest (4)	56.235	19.634
Sex		
Male	43.216	19.305
Female	50.767	19.293
Sector		
Urban	57.531	19.261
Rural	39.105	19.320
Region		
North Central	43.108	21.535
North East	33.751	12.667
North West	39.677	20.440
South East	60.732	15.764
South South	37.388	20.072
South West	48.442	22.265

Source: Computation from HNLSS 2009 data.

Conclusion

This study found that the prevalent idiosyncratic shocks in Nigeria are the death of the household head, conflicts in the community, death of a spouse, the household head being away, spouse away from home, household head hospitalized and personal theft. The shock with the highest incidence of occurrence country-wide was the death of the household head. Risks affecting households in the country can be categorized as security risk, social risks, life-cycle risks and health risks. The extreme poor were the most exposed to the death of the head of the household relative to the national average followed by the moderately poor and non-poor. Rural households are more exposed to the death of household heads relative to the national average than urban households. On welfare impact of risks, the study deduced that death and absence of the household head have a negative impact on the consumption level (welfare) of the affected rural households. In the same vein, the absence of the household head and burglary was expected to reduce consumption of affected rural households in the North

eastern region of Nigeria, the wealthy status of affected households however more than compensated for the negative effects of the shocks. Further, the study observed that households adopt different risk management strategies which could either be coping, mitigation, reduction or combination of strategies. In general, most of the strategies adopted by households are health-related.

Arising from the findings of the study, the following recommendations are pertinent. First, national development policy and programmes articulated towards investment in well-managed and needs-responsive infrastructures like good health facilities, pipe-borne water, and road network are needed to reduce the prevalence of risks as most risks are health and life-cycle related. Secondly, because of the high poverty rate in the country, there is a need to subsidize and sensitize people to the need for life micro-assurance as this will help reduce the impact of the demise of the breadwinner on the household's welfare.

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