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How do the poor cope with health shocks? Experiences from a cross-sectional study in Uganda

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RESEARCH

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ABSTRACT

This study sought to identify determinants in choosing from different coping strategies in cases of illness, injury and death shocks and how these strategies vary across socio-economic groups in Uganda. Data from a cross sectional survey covering a total of 1496 households collected by researchers from Makerere University in 2012 was used. Four coping strategies, besides social and non-social protection strategies were explored. Descriptive statistics and multinomial logistic regression techniques were used in the analysis of health shocks and determinants of choices of coping strategies. Marginal effects were computed for the multinomial regression coefficients. Illness (83.9 per cent) was the most common health shock reported followed by death of a household member (25.8 per cent) and injury (15.8 per cent). Borrowing and external assistance were the most commonly used strategies to cope with illness shocks and reliance on own savings or assets was minimally used. Non-social protection initiatives2 were used most to respond to illness shocks compared to formal social protection initiatives3. Regression results shows that the poorest households were 0.28 times more likely to seek external assistance to deal with shocks than the wealthier households. This suggests lack of capacity to cope and dependence on unreliable strategies exacerbate impoverishment. Governments needs to promote comprehensive coping strategies such as universal health insurance, targeted social protection initiatives and develop inclusive and innovative poverty reduction strategies that enhance the capability of households to cope with effects of health shocks.

Key Words

Health Shocks, Coping Mechanism, the Poor,Uganda

Introduction and Motivation

This study sought to identify determinants in choosing from different coping strategies in cases of illness, injury and death shocks in Uganda. Understanding the strategies poor households use in response to health shocks and in particular, the burden of direct patients' expenditures is of considerable interest for both researchers and policy makers all over the world. Health shocks are a major cause of vulnerability to poverty for households with limited coping capacity. Though literature on coping strategies abounds, empirical evidence on how these strategies vary across socio-economic groups is limited. Adverse health shocks such as illness, severe injury and sudden death of household member are largely unpredictable (Heltberg & Lund, 2009; 2007). These health shocks can have devastating physical, economic and welfare consequences on individuals and households. Ill-health for instance, can cause a significant setback in welfare improvement, particularly amongst the poor with limited capacity and safety nets[1].

In terms of incidences, there is increasing evidence that households in low income countries (particularly in Sub Saharan Africa) face various health shocks over their life cycle (see for example, studies by Gertler and Gruber, (2002); Wagstaff, (2007); Beegle et al., (2008) and Gustafsson-Wright and Emily (2010). Literature on health shocks and coping strategies shows that informal coping strategies employed by households to mitigate cost of illness have implications on both transitory and permanent incomes[2,3]. This, for instance means that health expenditures financed out of current income or savings, but where smoothing is imperfect, is likely to increases poverty. In situations where health payments cannot be completely financed through current income, informal coping strategies, such as depletion of assets, borrowing at an interest rate and buffer stocks, or social networks are used. If borrowing and asset depletion are adopted, more debts may be accumulated with long-term negative effects for the households' income generating capacity and ability to cope

with future shocks. This is even worsened when households are struck with covariate shocks and chronic illnesses, such that coping mechanism become less effective and informal insurance fails[4-10]. In effect, some households may be forced to forgo treatment altogether because of lack of assets and social safety nets, which may have long-term consequences through reduced health and depreciation of human capital in general. Dercon, (2002) while trying to understand the ability of households to cope with distressing shocks shows that the type of shocks matter. Using data from Ethiopia for instance, Dercon, found that most households use informal borrowing to cope with covariate shocks which exacerbate their vulnerability to worse cases than before[10-12]. Other studies have showed that households sell assets to cope with illness or injury. Leive and Xu (2008) demonstrate that coping with health care payment through borrowing and selling of assets is common in many African countries. For instance they showed that 23 per cent of households in Zambia and 68 percent in Burkina Faso either borrowed or sold assets[14-16]. On the other hand, Kurk, Goldmann and Galea (2009) in a fairly global study on hardship financing that covered more than half of the global population, revealed that up to 22 per cent of households had borrowed to cope with illness cost. While borrowing seems to be a popular choice to cope with shocks, it is largely unreliable and not even attainable for the absolutely poor who have no collateral against which to borrow[16-20]. Besides, the usually high interest rates against such borrowing is prohibitive, so that the poor may find themselves seeking for external assistance as they are more eligible for such assistance. In addition to the coping strategies identified above, literature also recognizes the role of social protection in providing critical safety net against health shocks for the poor households (Schubert, 2005). Three categories of social protection initiatives (formal social protection, informal social protection and non-social protection initiatives) have been used by households in response to health shocks. For this study savings and depletion of assets, borrowing, seeking for external assistance and living condition adjustment were investigated besides Social Protection Initiatives (SPIs). This is primarily because SPIs are underdeveloped and have low coverage. However, to the best of our knowledge, studies that have used household-level data sets to investigate quantitatively the coping strategies adopted by households to cope with health shocks and how household-specific characteristics determine choice of a particular coping option are limited in Uganda's case. Thus, the justification for this study.

Health shocks incidences and coping strategies in Uganda's context

In 2016, 28 per cent of Uganda's population reported to have suffered either illness or injury two weeks prior to the National household survey (UNHS), Uganda Bureau of Statistics (UBoS-UNHS, 2016/2017) report. According to the Health Sector Strategic Plan (HSSP), the leading causes of ill-health and mortality in Uganda are Malaria, HIV/AIDS and TB, (HSSP 2010/11-2014/15). Malaria fever (26 per cent) is quite prevalent and malaria-specific mortality among the under-five was reported between 70,000 and 100,000 child deaths per year, (Nabyonga et al., 2013). Households affected pay a significant proportion of their incomes and or savings (70.9 per cent) for consultations, medicines, transport and hospitalization. Nabyonga et al., argues that whereas the biggest proportion of out of pocket (OOP) payments are for medicines (54 per cent), hospitalization is the most expensive at an average expenditure of US$7.6 per child, which can be catastrophic for the poor households. Catastrophic out of pocket expenditure on health care raises important policy and development concern due to its negative effect on households' welfare and ability to finance consumption of other basic needs.

Social protection, if well-developed plays a crucial role in providing access to critical health services for identified vulnerable groups experiencing such shocks like illness and injury. In Uganda, formal social protection Initiatives (SPIs) such as Social Action Grant for Empowerment (SAGE) are implemented under the Ministry of Gender, Labor and Social Development (MGLSD). However, its coverage and scope still remains low. For instance, only senior citizens (aged 80+years) are covered and do not consider other vulnerable groups such as women, children and the poor. Medical insurance exists only for public servants and those in formal employment leaving the bulk of the population (especially in the informal sector) without protection. Protection from risks and shocks is fairly non-existent in Uganda due to market and Government failures; as such the exposure to health risks presents a challenge to fighting poverty and income inequality. Effective health shocks mitigation both at household and national level is constrained by a number of factors. At national level, there is limited scope for insurance against risks, due to the underdeveloped credit and insurance markets; limited scope for social insurance, given high levels of unstable and irregular wage employment and widespread unemployment; limited resources for formal social protection measures, given the competing demands on national budget and limitations in reaching the rural (and even urban informal sector) population which is spatially scattered, occupationally diverse and administratively difficult to service. At household level, high rates of poverty limit households' capability to handle shocks in general[21]. As

a result, many poor households resort to not only desperate and risky but also usually unreliable and unsustainable coping options like borrowing at high interest rates and sell off of assets. Worse still, others ignore illness with the hope that it will go away on its own. Ignoring illness allows the illness to progress and the complications arising increases medical costs, vulnerability of falling further into poverty, and even premature deaths (Heltberg and Lund, 2009). Clearly, protection against health shocks is very much limited which raised 2 important questions to motivate this study. The first was how do households especially the poor cope with health shocks? The second was what determines the choice of coping mechanism to respond to these shocks?

In terms of effects, while a healthy population undisputedly plays a crucial role in improving productivity, poverty reduction, and growth (Bloom et al., 2004), an ill-fated population suffers[23,24]. This is because it (ill health) makes the affected individuals and households both physically and mentally less energetic, less productive, more likely to be absent from work and earn low wages (Burton et.al 2006, Matovu et al., 2012). The consequences of illness and injury can be experienced in the short run (in terms of medical expenditures) and in the long-run (in terms of loss of incomes earned). Noted that shocks reinforce each other in their welfare-depressing impact with health shocks significantly accelerating risks of welfare loss among greater-affected households. In a global participatory poverty study titled “Voices of the poor” for instance, an Egyptian woman reported "we face a calamity when my husband gets ill”; “Our lives come to a halt, until he recovers and gets back to work” (Wagstaff, 2007; Narayan et al., 2000). Also a case was reported of a 26 year-old man in Lao Cai, Vietnam, who as a result of large health care costs caused by his daughter’s severe illness fell from being the richest man in his community to being one of the poorest. According to Xu et al., (2003), health care and medical expenses have reached catastrophic levels in many rural communities of low income countries. At the global level, the World Health Organization (WHO) reported that over 44 million households are annually faced with financial catastrophe. Worse still about twenty five (25) million are, pushed into poverty, due to out of pocket (OOP) health care payments and medical expenditure (Shi et al., 2011). Serious health shocks can lead to poor health outcomes and though there exists informal risk management arrangements that can offer some degree of protection against health shocks, they are unreliable[25]. As a result, consumption smoothing is disrupted with far reaching consequences for household welfare in terms of food insecurity, irreversible malnutrition in children and destitution in the long run as pointed out by Heltberg and Lund, (2009). Households may also find it difficult to hold productive assets which in turn hinder their ability to grow incomes and escape poverty (Anjini, 2004). All these, undermine efforts to achieve personal welfare growth, poverty reduction and economic growth and the Sustainable Development Goals (SDGs) for health in particular.

Social Protection interventions and health shocks

Social Protection Interventions (SPIs) are specific instruments, strategies and actors involved in social protection provisioning (Development Research and Training (DRT) discussion paper No.1/2008). In terms of conceptualization, social protection is equated to social security, which is often interpreted to mean the specific public programs of assistance, insurance and benefits that people can draw upon in order to maintain a minimum level of income or welfare in case of shock occurrences (Lwanga-Ntale et al., 2008). An analysis of studies of some social protection initiatives like social cash transfer programs in developing countries reveals that their impact has been generally positive and that the costs are affordable (Schubert, 2005). Adato and Bassett, (2009) argue that cash transfer programs can assist vulnerable families secure basic subsistence where illness or death reduces incomes. SPIs compliment other forms of assistance by providing basic social protection to households that cannot be reached by mainstream development programs. Though under exploited in Sub-Saharan Africa, Studies show that SPIs have positive impact on household welfare. In Malawi, illness was reduced by 23 per cent among children participating in the Mchinji social transfer program, compared to 12 per cent of children from non-beneficiary households. In Ethiopia, 50 per cent of productive safety net program (PSNP) beneficiaries used health facilities more in the year the program was introduced than in the previous year[26-30].

Wagstaff and Pradhan (2006) examined the effect of Vietnam's social health insurance that was introduced in the 1990s on OOP and catastrophic health spending. Their results showed that the introduction of the social health insurance in the country led to decreased OOP and catastrophic health spending, increased health care utilization, and improved health outcomes. Their major conclusion was that by reducing financial risk, households had to rely less on coping strategies such as savings. In contrast, Wagstaff (2010) found no impact of Vietnam's health care fund for the poor on utilization, although there was evidence to suggest that it reduced OOP health spending. A similar analyses in rural China, Wagstaff et al. (2009) found positive effect of a voluntary health insurance scheme on utilization of health services between 2003 and

2005, but no effect on OOP health spending. However, for urban China, Wagstaff and Lindelow (2008) found that health insurance has contributed to an increase in OOP spending and catastrophic payments, which they attributed to increased utilization and behavioral responses by health care providers. In Indonesia, Sparrow, Suryahadi and Widyanti (2013) investigate targeting and impact of Askeskin programme using panel data and difference-in-differences estimation combined with propensity score matching[31]. They found that social insurance improved access to health care through increased utilization of outpatient among the poor. Limwattananon et al. (2013), measured the impact of health care and household OOP medical expenditure of a major health insurance reform in Thailand. He showed that the reform reduced the likelihood that someone goes without formal treatment when sick by 11 percent while inpatient admission increased by 18 percent and the mean household medical expenditure reduced by more than 10 percent. In Ghana, Amponsah (2013) shows that the introduction of the NHIS increased health care utilization of insured households, while Nguyen, Rajkotia and Wang (2011) found a positive financial protection effect of health insurance in Ghana[32]. This literature provides concrete evidence of the role of social protection interventions in enhancing health shocks coping strategies among households.

Materials and Methods

This section provides a description of the data and variables used in the study, diagnostic tests conducted and the analytical econometric model used.

Data and Description of Variables

Data for this study was obtained from a large research project on "Social Protection and the Vulnerable Communities in East Africa": Implications for Household Welfare. The project was implemented by researchers from Makerere University (for the Ugandan arm of the main study), University of Nairobi (for the Kenya arm of the main study), and the University of Burundi (for the Burundi arm of the main study) in the period 2010-2013. Only data collected in Ugandan was used in this paper focusing on health shocks and the coping strategies that was not examined in the main study. A total of 1542 households were interviewed, but analysis was conducted on 1496 households for which data was complete. While both qualitative and quantitative data were collected, the study focused on quantitative data which was collected using a standard questionnaire. The questionnaire comprised of nine (9) modules: Social demographics, health shocks, other shocks, education for children, asset accumulation, enterprise development for women, household expenditure (food and non-food) and informal social protection. This study focused only on the health shock component.

The study variables were broadly categorized into health shocks (illness, injury and death), socio-economic and demographic characteristics of the household and coping strategies variables (assets and savings depletion, borrowing, external assistance and living condition adjustment, formal social protection, informal social protection and non-social protection initiatives). The use of social protection coping strategies was aimed at finding out the extent to which households' access social protection interventions in responding to health shocks. The detailed description and definition of variables is presented in Table 1- appendix section. Descriptive statistics were used to analyse reported health shocks by socio-economic and demographic characteristics. Besides social protection initiatives, the reason for having the other coping strategies is that social protection initiatives, are limited in scope and coverage in Uganda and besides some of the districts were the data was collected from did not have these initiatives by the time of data collection. STATA 15 was used to conduct the analysis.

Diagnostic tests

Before presenting the results of the study, we present and discuss the econometric checks of robustness. Four diagnostic tests (multi-Collinearity, heteroscedasticity, variable omission/ specification bias test and test for independence of irrelevant alternatives) were conducted in this study. Multicollinearity is believed to exist whenever the correlation coefficients have values of 0.8 or greater. All the independent variable used in the model have low correlation coefficient values with the highest being 0.3606, which indicates absence of multicollinearity. In addition Variance Inflation Factor (VIF) analysis was conducted and results show absence of multicollinearity because VIF<10 or 1/VIF>0.1 indicates absence of multicollinearity. See results in Table 2. Heteroscedasticity i.e. variance of the unobserved error term (μ) changes was tested using Breusch-Pagan and Cook-Weisberg test. The study failed to reject the null hypothesis of homoscedasticity at 0.05 level of significance-see section 4.2 for results.

Results from Ramsey Reset test for variable omission shows that there is no need for more variables. The p-value (0.2015) is higher than the threshold value of 0.05 (95 per cent) significance level; hence we fail to reject the null hypothesis that there is no variable omission. In addition, specification error / bias test shows that the model was well fitted as the p-value of the –hatsq (0.508) is statistically insignificant and has the right signs as presented in Table3, See appendix section.

As it is the practice in analyzing multinomial logit or probit models, the assumption of the independence of irrelevant alternatives (IIA) must hold. Hausman test (Hausman and McFadden, 1984) was conducted to check whether the IIA assumption was violated or not, results suggest that IIA was not violated. See results in section 4.2.

Analytical Econometric Model

One way to achieve this is by instructing women to increase from seven to nine levothyroxine tablets per week as soon as pregnancy is confirmed. In all levothyroxine-treated women, serum TSH should be assessed every 4 weeks during the first half of gestation and at least once around week 30. Following delivery, levothyroxine doses can be decreased to preconception levels, with serum TSH testing performed at approximately 6 weeks postpartum. Maraka et al. (2016) concluded that the value of levothyroxine therapy in preventing these adverse outcomes remains uncertain[33].

The econometric model adopted to analyze the choice of health shock coping mechanism in this study is the Multi Nomial Logit Model (MNLM). The determinants of choice of coping strategies are modelled as limited dependent variables and 4 variables defined as savings and asset depletion, borrowing, external assistance and adjusting living conditions (Table 1) are used. In the multinomial logit model the link function is the logit transformation while in multinomial-probit models, the link function relating the linear predictor to the expected value is the inverse normal cumulative distribution function. Greene (1997, p. 875) argues that in most applications, probit and logit models seem not to make much difference. It is against this backdrop, that we sought to employ the multinomial logit model basing on the view that the results will not be significantly different from those that would emerge from a multinomial probit model. Multi Nomial Logit (MNL) models consist of many alternative choices, of which one is chosen at a time and it bears the property of the IIA. The model assumed that the determinants of probability of coping with shocks are dependent on socio-demographic and economic characteristics as defined in variable description Table1.

In this model, let DCS (determinants of Coping Strategies) be the dependent variable with J outcomes from 1 to J. Let X be a vector of K independent variables plus a constant term for the intercept. The probability (pr) of observing outcome m for a given X is given as:

$$\Pr(DCS_{ij} = m \setminus X) = \frac{\exp^{(\sum_{j=1}^{k} \alpha + X_{kji}\beta_{kj})}}{\exp^{(\sum_{j=1}^{k} \alpha + X_{kji}\beta_{kj})}} \quad \ldots\ldots i$$

Which on normalizing becomes

$$\Pr(DCS_{ij} = m \setminus X) = \frac{\exp^{(\sum_{j=1}^{k} \alpha + X_{kji}\beta_{kj})}}{1 + \exp^{(\sum_{j=1}^{k} \alpha + X_{kji}\beta_{kj})}} \quad \ldots\ldots ii$$

Where: X represents the set of socio-demographic and economic characteristics (Age in full years, sex, marital status, household size, education, employment type and wealth status) of the household who experienced any of the shocks (illness, injury and deaths). is a set of estimated parameters that determine the choice of coping mechanisms adopted by the household heads and of course the error term not explicit in this framework. i and j, represent cases and categories respectively. Since the sum of probabilities over a range of events equals to one, equation ii was transformed into equation iii.

$$\Pr(DCS_{ij} = m \setminus X) = \frac{1}{1 + \exp^{(\sum_{j=1}^{k} \alpha + X_{kji}\beta_{kj})}} \quad \ldots\ldots iii$$

In this study, the authors report marginal effects (M.E) of the attributes on the probabilities such that equation iii was transformed into equation iv.

$$ME_j = \frac{\partial P_i}{\partial X_i} = P_j(\beta_j - \sum_{j=1}^{k} P_k\beta_k) = P_j(\beta_j - \beta_k) \quad \ldots\ldots iv$$

Estimation results

In this section results of the study's analysis are presented beginning with descriptive statistics, diagnostic tests and empirical multinomial logit results.

Descriptive statistics

Following the conventional approach, we begin with presentation of descriptive statistics of the study variables (see Table 4), to provide a firm foundation for the quantitative results. We note that no variable has a standard deviation equal to zero; therefore all variables qualify to be included in the regression. In addition, it is observed that the maximum and minimum values of our variables are around the mean values and hence we conclude that there are no outliers[34].

Diagnostic Tests Results

As mentioned earlier on in section 2.2, diagnostic test for multicollinearity did not find evidence and concludes that the cross-sectional data set or variables used in this study do not suffer a problem of multicollinearity.

Breusch-Pagan/Cook-Weisberg test results for heteroskedasticity

Ho: Constant variance

Variables: fitted values of choice

chi2(1)=1.23

Prob >chi2 = 0.2680

Further, we tested for independence of irrelevant alternatives (IIA) and from the test results, we failed to reject the null hypothesis of violation of IIA (H_0 ⟦:C⟧_1=C_2=C_3=⋯=C_n=0) i.e. choices are independent. Choice set partitioning test of comparing full Multi Nomial

Logit Model (MNLM) coefficients with the coefficients of the restricted model was used. The coefficients of variables from the two models were similar and had the same signs. Therefore, the null hypothesis of independence of choices could not be rejected suggesting that the use of MNLM was appropriate as shown in the IIA test result below.

The Hausman Test Results for Iia

b =consistent under Ho and Ha; obtained from mlogit

B=Inconsistent under Ha, efficient under Ho; obtained from mlogit

Test: Ho: Difference in coefficients not systematic

$$chi2(0) = (b-B)'\left[(V\_b-V\_B)\wedge(-1)\right](b-B)$$

$$= 0.07$$

$$\text{Prob} > chi2 = 0.3944$$

$$(V\_b-V\_B \text{ is not positive definite})$$

Empirical Results

In reported incidences of illness, injury and death (death of head, an important cash earner & other member of the household), our study found that Illness (83.9 per cent) was the most commonly reported health shock followed by death of other household members (25.8 per cent) and injury (15.8 per cent) shocks. Deaths of household head and of an important cash earner were the least reported (see Figure 1). Considering reported incidences of health shocks by wealth quintiles, illness and death of household head shocks were reported more by the poorest households. The wealthier households reported more on injury and death of other members of a household[35].

Coping strategies by category of health shocks

Households used multiple coping strategies, in most cases simultaneously to respond to health shocks. In this study, 4 coping strategies (Asset & savings, borrowing, external assistance and living conditions adjustment) were modelled. Borrowing (95.6 per cent) was used most in responding to illness shock and death of head of household (9.7 per cent). For illness only, borrowing was followed by assets and savings depletion (89.1 per cent), external assistance (82.9 per cent) and living conditions adjustment (63.3 per cent). Assets and savings depletion (17.9 per cent) was the most used coping strategy in responding to injury shocks. External assistance (4.7 per cent) and living conditions adjustment (35.2 per cent) were relied on more to respond to death of an important cash earner and death of other members of households. Considering Welfare levels, the poorest households relied exclusively on adjusting conditions of living in responding to illness and death of an important cash earner shocks than the wealthier households. On the other hand, the wealthier households tended to rely more on assets and savings depletion to respond to injury shocks and death of other members of the household. Borrowing and living condition adjustment were relied on most of the times by the poorer households to respond to illness, death of an important cash earner and death of household head shocks. Further, poorer households tended to rely more on external assistance to respond to illness shocks. In terms of social protection initiatives, results show that households relied more on non-social protection initiatives to respond to illness shocks (59 per cent) and injury shocks (49 per cent). Informal social protection initiatives were mainly used to respond to deaths shocks i.e. death of household head (61.3 per cent), death of other members of a household (57.1 per cent) and death of an important cash earner (51.9 per cent). Formal social protection initiatives were the least used coping strategies; majorly to respond to illness shocks (30.2 per cent).

Using a multinomial logit model (See Table 9) to analyze household's determinants of choices of coping strategies (savings and asset depletion being the base category of the MNLM), results show that households were 0.051 times more likely to borrow, but 0.075 times and 0.12 times less likely to use external assistance and adjust conditions of living compared to depletion of assets and savings to respond to illness shocks. Households were 0.164 times and 0.052 times more likely to use external assistance to respond to death of an important cash earner and death of other members of a household respectively, than to deplete assets and savings. Likewise, households were 0.044 times more likely to adjust conditions of living than deplete assets and savings for death of other members of a household. External assistance was used most to respond to death of household head shock, as households were 0.144 times more likely to use it than deplete assets and savings. In terms of borrowing, households were 0.082 times more likely to borrow, but 0.138 times less likely to adjust conditions of living compared to depletion of assets and savings for death of household head shocks. In summary, the health shock category experienced plays a very important role in determining households' choice of coping strategies. Households were more likely to borrow than deplete assets and savings to respond to illness shocks, but less likely to seek external assistance and adjust conditions of living. On the other hand, households were more likely to use external assistance to respond to death of household head shock than deplete assets and savings.

In terms of socio-demographic characteristics of the household (Age of household head, household size, occupation of household head (farm or non-farm), marital status of head, gender of head, level of education attained by head and expenditure quintile to which the head falls), we found that household heads with a large number of

members were 0.001 times more likely to use external assistance to respond to health shocks compared to depletion of assets and savings. Household heads in farm employment were 0.034 times more likely to borrow (borrowing is mainly from non-bank sources) than deplete assets and savings compared to households heads in non-farm employment. Male-headed households were 0.113 times less likely to adjust condition of living compared to female-headed household in relation to asset and saving depletion. In comparison to depletion of assets and savings, household heads with no education were 0.073 times more likely to borrow, but 0.093 times less likely to adjust conditions of living compared to their counterpart the more educated. Households with primary and secondary education were 0.103 times and 0.111 times respectively more likely to adjust conditions of living compared to those with post-secondary education. This means that more schooling shields households from undertaking coping strategies that would erode their welfare. This is because more education offers households greater capability to handle shocks compared to less education.

Considering the welfare quintile to which the household falls, the poorest households were 0.139 times less likely to adjust living conditions than deplete assets and savings compared to the wealthiest households. Whereas households across all wealth quintiles used external assistance to respond to health shocks, the poorest households were 0.284 times more likely to seek external assistance than their counterpart the wealthiest households. This may suggest that the poor households have limited capacity to deal with health shocks hence, the use of external assistance is the only means for which they are eligible. Overall, model results indicate that the health shock category experienced and households' socio-demographic characteristics play an important role in determining the choice of a particular coping mechanism[36].

Discussion

Reporting illness shock in particular is very important not only for the individual affected, but also for health management practices and public health in general. The high percentage of reported illness is a reflection of ill health among the population, which is probably attributed to ill health care systems especially in the rural areas. These findings are similar to those of Heltberg and Lund (2009), in a study entitled "shocks, coping and outcomes for Pakistan's poor"; where, they showed that illness and death of household members were the most significant health shocks reported. Also, Levine and Moretti, (2006) and Gertler and Gruber (2002) showed similar results that among health shocks, illness cases, deaths of household members and injuries are the most reported. Pearson chi-square test for difference in reporting shocks incidence between the poor and none-poor showed statistically significant reporting differences (See Table 5). This implies that the poorer households are more vulnerable to illness health shocks than their counterpart the wealthier households since the poor have limited capability to cope with health shocks. Injury was reported more by the wealthier households than the poorer, probably because the wealthier households perceive injury as a more welfare threatening shock than the poorer households who sometimes simply wait it out.

High percentages of reliance on borrowing and living condition adjustment to respond to health shocks imply that households particularly the poor are very seriously constrained in their capacity to handle such health shocks. Depletion of savings and assets is impoverishing as this pushes households further into abject poverty and borrowing is highly unreliable. This deduction is in line with that of Wilms, (2006) and Asfaw et.al, (2004, 2007) who argued that the use of productive assets for consumption smoothing incurs significant welfare loses to poor households. In addition, adjustment of living conditions especially reduction in food intake and withdraw of children from school has detrimental impact on welfare and human capital development. This is similar to the findings of Stefan.D, (1999-2004)

The low usage of formal social protection strategies imply that they are not only poorly developed, but also limited in coverage and scope. Moreover, it is known that Public Service Pension Scheme (PSPS) and National Social Security Fund (NSSF) cover only about 5 per cent of Uganda's working population, Matovu et al (2013, unpublished) and a few in private employments. This implies that majority of the households especially the poor, are still left out, helplessly vulnerable to health shocks. Overall, nearly all categories of coping strategies were used, mostly to respond to illness shocks. This shows how serious illness shocks are on household welfare[37-41].

The use of multiple coping strategies to deal with illness and death of household head shocks simultaneously imply the inappropriateness of a single coping strategy to deal with the shocks on the one hand. On the other hand it portrays the complexity of the shocks household face. This finding is in line with the findings of Tongruksawattan et al (2010); which reveals seriousness of these health shocks on households' wellbeing.

Conclusion and Policy Recommendations

This paper sought to identify determinants in choosing from different coping strategies in cases of illness, injury and death shocks in Uganda. It also investigated the incidence of these three health shocks and determinants of reporting by socio-demographic characteristics of the households. This was done to understand the choice of coping strategies adopted. Among the three shocks illness was the most reported and reporting increased with the level of education and being wealthier. Regarding coping strategies, borrowing was used most of the times to respond to illness shock and death of household head, while depletion of assets and savings, was used most of the times to respond to injury shocks. Education and welfare status of household head played a significant role in determining the choice of coping strategies. For instance the poorer households were more likely to seek for external assistance than the wealthier households to respond to shocks signifying lack of capability to deal with shocks, thus their eligibility for assistance.

However, this study had a number of limitations. First, the time frame used to define occurrence of illness and injury was two weeks prior to day of survey and occurrence of death extended from two weeks to five years prior the survey. This was a problem which was harmonized by considering death only within 6 months prior to survey. Also coping strategies were reported as used in the two weeks prior to the survey implying this would not fully be comparable with death shock if it occurred five years ago. Besides, the study focused solely on coping strategies and incidences of shocks. It did not investigate the severity of shocks like illness and injury and the impact of the shocks on welfare of households.

Despite these limitations, the study makes some important contribution to the literature on health shocks and coping strategies. Results of this study suggest that health shocks experienced by households in Uganda lead to loss of savings and assets and therefore have implications on their welfare. Hence more effective health shock management instruments are needed to enhance the capacity of households to cope with the negative effects of health shocks. For example, enhancing the capacity of social safety nets targeting vulnerable households particularly in remote areas could be given priority over broad based government support schemes. Furthermore, healthcare insurance should be made more responsive and target-oriented. The study further shows that formal social protection initiatives are underdeveloped and low in coverage. Therefore, policies to improve consumption stability, for example through better social safety nets (formal social protection initiatives strengthening) and health insurance instruments, would be good for growth and welfare enhancement, particularly for the vulnerable poor. In addition, since the poor tended to report less health shocks and generally have limited capacity to deal with shocks, more inclusive growth and poverty reducing strategies should be promoted to enhance the capacity of the poor to deal with shocks more generally. The strategies could include: providing quality education, skills development and wealth creation.

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How do the poor cope with health shocks? Experiences from a cross-sectional study in Uganda

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Figures & Tables

Table1: Variable description

Variable	Description
Illness	1 if household reported any illness in the last 2 weeks prior to the study (e.g. cough, cold and diarrhea or any other illness) and 0 otherwise.
Injury	1 if household reported injury in the last 2 weeks prior to the study due to Accidents and 0 otherwise.
Death of household head	1 if household reported death of head in the last five years prior to the study and 0 otherwise.
Death of other members of household	1 if death was reported for Sister/Brother of head or spouse, nephew/niece, servants, other relatives and non-relatives resident in the household and 0 otherwise.
Death of an important cash earner	1 if death was reported in the last five years prior to the study and 0 otherwise.
AgeYr	Age of household head in complete years (0). Age 2 (1) is used to determine the influence of aging on decision making regarding health shocks reporting and coping strategies adopted.
Household size	Small (1-5 members); large (6-10 members); very large (11 and above members). Minimum household size is1 and maximum 17 in this survey
Non-farm employment	1 if household head is Employed in business or formal occupation such as school (i.e. not in farming)
Farm employment	2 if Employed in farming (crop and livestock production).
Marital status	1 if married and 0 otherwise.
Sex	1 if male and 0 if female
Non-educated	1 if household heads have no formal education
Primary education	2 if household heads have completed primary education (P1-P7)
Secondary education	3 if household heads have some or completed secondary level education, but with no professional training
Post-secondary education	4 if household heads have completed secondary education, got diploma, completed a degree and above.
Expenditure quintiles	Constructed from total household expenditure (food and non-food expenditures) data using stata's Xtile command: Expenditure quintile 1 (the poorest), 2 (the poor), 3 (middle), 4 (the wealthy) and 5 (the wealthiest).
Location	All rural. Note that the districts covered in the study are typically rural in nature, so they were treated more as rural districts, thus no urban –rural classification.
Categorization of Coping strategies	

Assets and savings depletion	Mortgaged assets, sold household assets, sold farmland, animals and used up savings
Borrowing	Borrowed money from financial institutions, friends and relatives, money lender and informal institutions
External assistance	Helped by relatives and friends, local church/NGO, international NGO, and spiritualists/divine intervention and remittances.
Living condition adjustment	Adjusted Consumption, withdrew children from school, child wage employment, alternative wage employment, started a new business, Migrated
Categorization of Coping mechanism into social protection initiative	
Non-SPs	Mortgaged assets, sold household assets, sold farmland, animals and more crops, used savings, Withdrew children from school, child wage employment, alternative wage employment, migrated and sent children to live elsewhere, borrowed money from financial institutions, money lender and informal institutions, Reduced food consumption and non-food expenditure; consumed low- cost- less preferred foods, started a new business,
Formal SP	Direct help from government, help from local and international NGO/church, social pensions and social transfers.
Informal SP	Borrowed money from friends and relatives, help provided by friends and relatives, spiritual prayers and remittances

Table 2: Variable inflation factor (VIF) test results for multicollinearity.

Variable	VIF	1/VIF
primary	3.38	0.295487
noeducation	3.32	0.301538
Totalexp_q~5	2.53	0.395058
secondary	2.22	0.450816
Totalexp_q~3	2.21	0.453436
Totalexp_q~4	2.19	0.456811
Totalexp_q~2	1.95	0.512975
female	1.43	0.700257
death_Hh~109	1.36	0.737422
nonfarm_em~t	1.17	0.855766
ageYr	1.16	0.861464
Hsize	1.13	0.885051
Illness	1.09	0.914371
death_Ca~111	1.07	0.932554
death_Ot~110	1.03	0.969432
Injury112	1.03	0.972622
Mean VIF	1.77	

Table3: Specification error/bias test

linktest						
Source	**SS**		**df**	**MS**		**Number of obs =1441**
						F(2, 1438)= 64.35
Model	157.379003		2	78.6895015		Prob > F=0.0000
Residual	1758.42808		1438	1.22282898		R-squared=0.0821
Total	1915.80708		1440	1.33042158		Adj R-squared=0.0809
						Root MSE=1.1058
choice	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95 per cent Conf. Interval]**	

_hat	1.60021	0.9110656	1.76	0.079	-0.1869499	3.38737
_hatsq	-0.131316	0.1983877	-0.66	0.508	-0.5204764	0.2578443
_cons	-0.6700722	1.030856	-0.65	0.516	-2.692215	1.35207

Ramsey Reset test results using powers of fitted values of choice (dependent variable)
Ho: model has no omitted variables
Ha: model has omitted variables
F (3, 1421) = 1.54
Prob > F = 0.2015

Table 4: Descriptive statistics of study variables

Descriptive Statistics of the Variables used in the Analysis (n=1496)				
Variable	**Mean**	**Standard Dev**	**Min**	**Max**
Health shock Category				
Illness	0.839	0.368	0	1
Injury	0.158	0.365	0	1
Death of Cash earner	0.029	0.167	0	1
Death of other member	0.258	0.438	0	1
Death of head	0.047	0.211	0	1
Age of HH yrs	44.768	14.309	15	65
Household size	6.867	2.619	1	17
Employment type				
Farm employment	0.662	0.047	0	1
Non farm employment	0.338	0.473	0	1
Marrital status				
Married	0.846	0.361	0	1
Not married	0.154	0.361	0	1
Sex				
Male	0.867	0.340	0	1
Female	0.133	0.340	0	1
Education level				
No education	0.275	0.447	0	1
Primary education	0.473	0.499	0	1
Secondary education	0.148	0.356	0	1
Post-secondary education	0.104	0.306	0	1
Expenditure quintile				
Very poor	0.167	0.373	0	1
Poor	0.203	0.403	0	1
Middle	0.230	0.421	0	1
Rich	0.192	0.394	0	1
Weathiest	0.208	0.406	0	1

Table 5: Reported incidences of health shock by welfare status

Health Shock	**Expenditure quintile**				
	Poorest	**Poor**	**Middle**	**Rich**	**Richest**
Illness	96.8	89.1	84.6	77.0	74.0
Injury	7.6	15.5	16.3	18.5	19.9
Death of household head	6.8	5.3	5.2	3.8	2.6

Death of other family Members	19.2	21.4	26.7	26.8	33.4
Death of an important cash earner	2	1.0	4.4	3.5	3.2
Pearson chi-square =156.0148 Diff=(4) P<0.001					
Source: Authors computations					

Table 7: Coping strategies by category of health shocks

Category of health shock	**Number of observations=1496**			
	Coping mechanism			
	Assets& saving depletion (per cent)	**Borrowing (per cent)**	**External assistance (per cent)**	**Living condition adjustment (per cent)**
Illness	89.1	95.6	82.9	63.3
Injury	17.9	16.8	16.1	10.6
Death of household head	3.3	9.7	7.2	2.5
Death other family members	22.8	24.7	26.0	35.2
Death of an important cash earner	2.3	1.8	4.7	3.0
Source: Authors computations				

Table 8: Household response to health shocks by Social protection categorization.

Shock	**TYPE OF COPING MECHANISM**			
	Non-SP (per cent)	**Social Protections (SPs)**		
		Formal SP (per cent)	**Informal SP (per cent)**	**Total SPs (per cent)**
Illness	59.0	30.2	10.8	41.0
Injury	49.0	11	40.0	51.0
Death of household head	30.7	8.0	61.3	68.3
Death of other family member	29.3	13.6	57.1	70.6
Death of an important cash earner	37.0	11.1	51.9	63.0
Source: Authors computations				

Table 9: Determinants of choice of coping mechanism (Marginal probabilities)

Explained variables	**Borrowing**	**External assistance**	**Adjust living Conditions**
Explanatory Variable	**Marginal probability**	**Marginal probability**	**Marginal probability**
Illness	0.051**	-0.075**	-0.120***
Injury	-0.002	-0.019	-0.02
Death of cash earner	-0.028	0.164**	-0.029
Death of other members	0.003	0.052**	0.044**
Death of household head	0.082***	0.144**	-0.138**
Age of household years.	0.001	0.005	0.01
Household size	-0.001	0.010**	0.001
Farm employment (Non-farm employment base)	0.034 **	0.013	-0.032
Married (Not married base)	0.03	-0.095	0.046
Male (Female base)	0.03	0.019	-0.113**
No education(post-sec Base)	0.04**	-0.093**	0.073**
Primary education	-0.006	-0.047	0.103***
Secondary education	0.001	-0.068	0.111***
Expenditure quintile 1	-0.018	0.284***	-0.139***
(quintile 5 base)			

Expenditure quintile 2	0.005	0.160***	-0.110***
Expenditure quintile 3	-0.002	0.117***	-0.012**
Expenditure quintile 4	-0.018	0.080**	-0.012

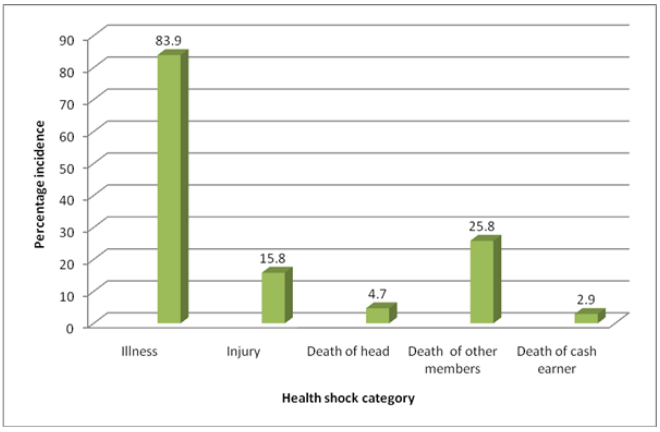

Figure 1: Incidence of reported health shocks by category

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