

## Economic consequences of death and disability in Nigeria

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### Abstract

Death and disability are two forms of health shocks that have been under-explored in the literature, despite having a devastating effect on human wellbeing. This paper examines the economic consequences of death and disability on household wellbeing in Nigeria. This investigation employs a Nigerian household panel survey from the General Household Survey (GHS) for 2009-10 and 2011-12 and applies random and fixed effects regressions with robust standard error to assess the effect of disability and demise of any member of the household on earnings, hours of work and medical spending. The findings reveal that the income of households is substantially reduced in the face of disability, and death. Disability is negatively associated with earnings though not statistically significant. Disability significantly influenced hours of work among household, death shows a negative relationship with work-hours but not statistically significant. Medical health spending increased significantly among households faced with disability, and death. Labour adjustment within the household cannot fully take care of lost income, although it tends to offset the reduction in hours of work. The regression results reject the hypothesis that households can preserve earnings when faced with death of a household member. A policy that helps mitigate the consequences of death and disability should be pursued by policymakers.

**Keywords:** Disability; Death; Earnings; Medical spending.

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## **1. Introduction**

Like most developing countries, high out-of-pocket payments are a major feature of Nigeria's health care system. The health system is further characterized by poor access to care and little or absence of formal protection. Death and disability can have substantial severe economic consequences for low-income countries households.

Disability of a household (HH) member is capable of impoverishing low-income household, if they incur substantial out-of-pocket (OOP) medical spending in the quest for medical care. Although household can avoid OOP healthcare spending by not seeking medical treatment, this could be associated with high future costs, such as sacrificing future earnings due to absenteeism from work by the sick individual or a healthy household member that had to refrain from work to look after the sick member, hence a reduction in productivity and decline in income. Disabled people that are employed received much lower remunerations than what those without disability earns. This can worsen the economic predicament of the already poor and raises the chances of non-poor but vulnerable households falling into poverty trap.

From a macro perspective, severe economic consequences of disability in a household may impedes economic growth and national development goals such as investment, and national output. Also, over dependence on private health expenditure or increase in user fees might reallocate limited medical care resources from the poor to the better-off, promoting inequalities in access to care Alam & Mahal (2014). The vulnerability of household to economic outcomes of disability is a function of household economic endowments and the employment status of the disabled individual.

Disability has been underexplored in the ailment and health crisis literature, most especially in low-income countries. Most studies (Meyer & Mok (2019); Bales (2014) treated disability as a feature of a sick person. These studies use changes in household members' ability to perform daily routine, due to disability. Disability is defined regarding injuries or accidents that incapacitates household member, such that they cannot carry out their daily activities. Poor sight, difficulty in walking is the prevalent disability associated with households in Nigeria (NBS, 2013).

Disability and poverty are complementary in nature. Empirical studies reveal that disabled people are often less educated, have limited employment opportunities, pose a higher proportion of unemployment, and face poor living

conditions as well as extreme poverty (Palmer, Williams, & McPake, 2016). The few empirical research on disability in developing countries reveals that disabled persons are economically deprived of education attainment and employment status, while there is a conflicting effect on the household. It is difficult to conclude on the economic consequences of disability in developing countries given the disparity in measures of disability, welfare indicators, and methods of analysis.

The influence of death can be ambiguous depending on whether the dead individual, was a net contributor (in terms of income) to the household or a mere consuming (not gainfully employed or not of working age) member before his or her demise. Few studies (Yamano & Jayne 2005; Grimm 2010; Khan 2010; Kadiyala, Rogers, Quisumbing & Webb, 2011) investigated the impacts of death on household welfare. The death of a member is different from disability in the sense that, death of a household member induced funeral expenses, sometimes from borrowing, and through asset depletion. Also, it brings about reduction in income that might have consequences on households' current consumption, and reduces the number of people utilizing the household resources.

In Nigeria, the major causes of death according to World Health Organization (WHO), 2016 and based on 2010 estimates were coughing, terminal diseases and spinal cord related diseases. Others are HIV/AIDS, Tuberculosis, and Malaria. About 220,000 HIV cases were reported in 2016 with about 160,000 deaths among the affected persons (WHO, 2016). There are some studies that explored the economic cost of specific ailments like HIV/ AIDS, tuberculosis and malaria in Nigeria.

For instance, Ukwaja, Alobu, & Hopewell (2013) focused on direct and indirect costs associated with curing tuberculosis among households in Ebonyi State, while Jimoh, Sofola, Petu, & Okorosobo (2007) studied the socio-economic consequences of malaria in Nigeria based on household ability to pay approach. However, considerable gaps remain. In particular, the literature on the implications of death and disability on hours of work, earnings and medical expenditure has not been captured in extant studies with the exclusion of those that are centered on shocks.

Consequently, Oyekale & Oyekale (2010) identified the shocks that are associated with poverty incidence in Nigeria. According to the study, a sudden and unplanned transition from employed state to unemployment status, lack of rain, poor agricultural returns, and insufficient credit to expand a business,

poor access to land, overpriced goods, poor earnings and economic hardship are the different shocks experienced among households in Nigeria. While Oni & Yusuf (2008), showed that shocks that are peculiar to individual and those that are covariate in nature bring about variation in the consumption expenditure of Nigerian households.

Given the limited number of study on the economic consequences of disability and mortality in Nigeria, as well as the proportion of people with disability, the primary target of this research is to examine the economic impact of death and disability on households' welfare in Nigeria. Specifically, the paper answered the following questions: what are the effects of death and disability on medical spending of the households? What are the effects of death and disability on hours of work and earnings of households? This study bridges this gap by employing the first two waves of the General Household Survey (GHS), 2010/2011 and 2012/2013 panel dataset to examine the effects of death and disability on household's welfare.

The study employed a static panel technique of analysis using fixed and random models due to their ability to address issues associated with estimating pool data, which are not adequately accounted for in the previous studies that employed cross-sectional data. The issues include correlated specific effect which is always associated with heterogeneity among the cross-sectional units. With the use of panel technique of analysis, the study accounted for heterogeneity across households and dealt with time-invariant omitted variables which are assumed away in pooled data.

## **2. Review of Empirical Evidence**

Death is an extreme form of illness that households face, especially aged household members. Some studies examine the effect of death on households' resources in developing countries where there is a high rate of mortality. In Kenya, the death of a grown-up person in the household was responsible for the decline in crop yields (Yamano & Jayne, 2005); in Zambia, there was a reduction in land earmarked for farming (Chapoto & Jayne, 2005). Similarly, the death of an adult female member of the household was found to reduce food and non-food consumption in Tanzania within the first five years of the incidence; Beegle, De Weerdt, & Dercon (2008).

The impacts of death on household resources in countries with low death rates revealed varied results. In Vietnam, earnings, food expenditure and non-food expenditure reduced in the face of the death of a grown-up member of the

household. Death decreased health spending in Vietnam; however, the decrease was offset by the rising cost of death rite and funeral. Wagstaff (2007) found that the death of an active member of the household significantly reduces earnings and expenditure on food items in urban areas. On the contrary, deaths do not have a significant influence on aggregate earnings. The study, further shows that urban dwellers are more exposed to health shocks, as evidenced by a reduction in earnings and rising medical expenses owing to high user fees.

Furthermore, some households were able to insure consumption against death with the use of intra-household labour adjustment and dissaving in Indonesia. For instance, Genoni, 2012; Khan, Bedi, & Sparrow (2015) found that households borrowed from friends, relatives and cash lenders to counter the negative influence of death in the short term. However, this tends to worsen family debt-to-income proportion overtime, hence further impoverish already poor household. Meanwhile, Bales (2014) revealed that death had no significant effect on earned income and even found that wage income rises with death, for a household that did not record a change in labour hour in the face of death.

An increasing number of studies examined empirically the relationship between disability and household resources both in developed and developing countries. Evidence abounds that the economic consequences of disability were channelled through rising medical expenditure and declining earnings. In the United States, Meyer & Mok (2019) found that onset of disability resulted in substantial declines in earnings, and disposable income, as intra-household network failed to insure consumption.

According to World Health Organization & World Bank, 2018, about twenty per cent of the global's poorest population have some form of disability and the poor are termed the vulnerable in the societies. The relationships between disability and economic outcomes are more pronounced in developing countries relative to developed economies. In developing countries, disabled people are less likely to be involved in economic activities relative to nondisabled people in the working-age. In the same vein, the disabled earn remarkably less below the nondisabled, as they are most likely not to be gainfully engaged, hence, the disabled are poor (Mete, 2008). Meanwhile, there is a high tendency that the poor, as a group, will be disabled then the non-poor, while employment prevents the disabled from falling into the poverty trap (Mitra, Posarac, & Vick, 2013).

Also, Bales (2014) found that disability significantly reduced labour supply among low-income households in Vietnam. The lower-income household also

experienced a major decline in earnings from self-employment activities except in the case of farming. The study further shows that medical health bills rise in the face of disability among the high-income earners and poor households. Lamichh, & Okubo (2014) examined the relationship between the level of education attained, employment status, and disability. The study reveals a strong correlation between educational qualification and job employment, but persons with disability are less likely to be gainfully employed when individual-specific effects are accounted for. The study recommends the need to increase investment in disabled people education, to raise their labour market participation.

Quintussi, Van de Poel, Panda, & Rutten (2015) in a study on the consequences of disability on household's welfare in India found that adverse health condition threatens the livelihood of low-income households that lacks access to the insurance scheme. The study further reveals that households were able to smoothen consumption in the short term using various coping strategies such as borrowing, assets depletion. In an extensive review of literature, Jones (2008) concludes that disability is associated with a decline in labour market participation rate. Similarly, Stabile & Allin (2012) found that childhood disability constitutes both direct and indirect costs to the household in the form of high medical spending, reduction in earnings, destruction of human capital and subsequent loss of future earnings for the child.

In a study on the economic cost of disability, Ali (2014) found that disability reduced economic product via a reduction in the productivity of households that experienced disability. The study concludes that intra-household coping strategies are not efficient in insuring household against the adverse effects of disability in Bangladesh. Given that persons with disability are among the low-income earners and highly susceptible to poverty, it is necessary to see the disabled group as an important issue when formulating policies towards achieving economic development; Groce, Kett, Lang, & Trani (2011).

### **3. Theoretical Framework and Methodology**

#### *3.1. Permanent Income Hypothesis (PIH)*

Friedman (1957) developed the permanent income hypothesis. The theory states that only permanent earning has an effect on overall earnings and hence, on real consumption. The theory suggests that individual or household optimize consumption over time by developing a likelihood of lifetime earnings, that ensures extra satisfaction derived from consuming additional unit of a good is the same throughout lifetime, therefore, severe illness or disability or death that

do not affect fixed earnings cannot influence household welfare Dhanaraj et al. (2015). In the absence of borrowing facilities and institutional barriers, it is pertinent for the households to preserve welfare using different risk mitigation and risk-sharing strategies. The strategies are falling back on saving, borrowing from friends and relation, gift or transfers from government and NGOs as well as sending remittances (Mujumdar, 2001; Bales, 2014; Dhanaraj, 2016). The hypothesis suggests that households ration expenditure on food and non-food item over time, in such a way that maximizes their marginal satisfaction. Consumers allocate income in the process of optimizing lifetime satisfaction such that households maximize satisfaction between periods and within the period, hence, little or no attention is given to the amount of income that accrues to each period.

The permanent income hypothesis can be illustrated mathematically: Assuming a representative household  $m$  at time  $n$  optimize lifetime utility given consumption.

$$\max_m \sum_{t=0}^T (1+\rho)^{m-t} u(c_{jm}) \quad (1)$$

Note  $u' > u'' < 0$ ,  $\rho$  is of time effect and  $m$  denotes household.

Assuming  $y_n(h_t)$  is household earnings,  $h_n$  denotes adverse health status to a family. The initial worth of asset in time  $t+1$  is given by

$$A_{mn+1} = (1+r)(A_{mn} + y_{mn}(h_{mn}) - c_{mn}) \quad (2)$$

Where  $r$  is the rate of interest that accrues to savings. Taking First Order Condition of equation (1) given equation (2) while evoking the differentiability properties of equation (1) gives:

$$u'(c_{mn}) = \frac{1+r}{1+\delta} E_{mn}[u'(c_{mn+1})] \quad (3)$$

Supposing constant relative risk aversion  $c_{it}^{-\phi} e^{\theta_{it}}$  (where  $\phi$  is the coefficient of risk aversion and  $\theta_{it}$  is preferences constant), taking the log of both sides over two time periods, gives

$$\ln \frac{c_{mn+1}}{c_{mn}} = \frac{1}{\phi} [\ln(1+r) + \ln(1+\delta) + (\theta_{mn+1} - \theta_{mn})] + u_{mn+1} \quad (4)$$

$U_{mn+1}$  represents stochastic term with mean of zero and constant variance at time  $t$  assuming households behave rationally. Household consumption overtime is strictly determined by preferences given that households' fixed earnings are not changed by negative health event subject to non-slack credit constraints. Households use a different coping strategy after carrying out a cost-benefit



analysis. This empirical intuition can be obtained using equation (5):

$$\Delta \ln \left( \frac{C_{mv}}{C_{mv}} \right) = \alpha_v + \delta \Delta h_{mv} + \sum \eta_k X_{mv} + u_{mv} \quad (5)$$

The model above equation (5) is an estimable equation of changes in logarithm of expenditure on consumption of family  $m$  in village  $v$ , on village specific characteristic  $\alpha_m$  health shocks  $\Delta h_{mn}$ , demographic controls  $X_{mn}$  and stochastic term  $U_{mn}$ . Permanent Income Hypothesis, however, did not suggest any means through which households can smoothen consumption in the face of income uncertainty or adverse health condition.

### *3.2. Effect of death and disability on household's earnings, hours of work and medical spending*

This section specifies a model to examine the impact of disability and death on households' hours of work, earnings and medical spending. The following equation is required to estimate the effects

$$\Delta Y_{it} = \delta_1 + \delta_2 d_2 + \delta_3 d_3 + \beta h_{ijt} + \sum_k \gamma_k X_{ijk} + \alpha_i + \varphi_j + \varepsilon_{ijt} \quad (6)$$

This is a regression of the change in the log of resources (hours of work, earnings and medical expenses) for family  $i$  in village  $j$  at time  $t$  against household unobserved impact ( $\alpha_i$ ), village unobserved impact ( $\varphi_j$ ), uncertainty factor ( $h_{ijt}$ ), covariates ( $X_{ijt}$ ), and a stochastic error term ( $\varepsilon_{ijt}$ ).

Households observed variables include the gender of household's head, age, and education, marital status and household size. The uncertainty variables are death and disability. The fixed effect captures household-specific unobserved factor such as taste and choices, health status that has the potential of influencing hours of work, household's earnings and medical expenses. The household fixed effect captures all time invariant unobserved factors such as taste and choices, health status that has the potential of influencing hours of work, household's earnings and medical expenses. A round dummy ( $d_t$ ) was included in the model to capture the component of outcome variation in period  $t$  and remained common to all households. The stochastic term represents random variation specific to a household at a particular point in time and assumed to be independently and identically distributed.

It must be noted that equation (6) can suffer from correlation in the composite error term ( $\alpha_i + \varepsilon_{it}$ ). For a nonbiased and efficient coefficient, the error term cannot be correlated with regressors. Whenever disability or death is correlated with household-specific effect, Ordinary Least Squares (OLS) would yield



biased estimator, due to the hidden or omitted variable. This study, therefore, used a fixed-effect model with a robust standard error that removed omitted variable bias in estimating the effects of disability and death. Hausman post estimation test was used to ascertain the suitability of FE or RE in producing consistent and efficient estimates.

The dependent variables in this study are death and disability, with the model estimated separately. The household variables are household size, household work hours, household income and household medical expenditure. These are designed to show the economic capability and welfare status of the household in the face of death and disability. Other covariates include age, gender, education, and marital status of the household head. This is because the socio-economic status of the household head tends to play an important role in determining the welfare status of the household.

### *3.3 Data description and source*

The study utilized the Nigerian General Household Survey (GHS) panel dataset developed by the National Bureau of Statistics (NBS) in collaboration with World Bank. GHS survey started in 2010 with development of the First Wave. It covers about 5,000 Nigerian households that span rural and urban areas. The Second Wave was conducted in 2013, with the sampled households. The GHS data combine the components of the poverty survey instruments; this includes the Core Welfare Indicator Questionnaire (CWIQ) called the Harmonized Nigeria Living Standard Survey (HNLSS) and the Nigerian Living Standard survey (NLSS) known as the HNLSS. The GHS data covered socioeconomic indicators such as demographics, education, health, labour and hours of work, expenditure on food and non-food consumption, family earning - activities, other sources of household income, shocks, informal coping mechanism and assets.

The same sampling frame was used for GHS-panel, it comprised 774 LGAs each. The sample frame was constructed into replicates, each state in Nigeria and FCT had 60 Primary Sampling Units (PSUs). A total of 2,220 Enumeration Areas (EA) was surveyed. Ten households were drawn from each EA, hence a sample size of 22,200 households across the federation. The 5,000 households were randomly selected from 500 EAs to form the panel component. Meanwhile, 4,916 households completed the interviews in the First Wave. As a result of the panel structure of the survey, some households had relocated from their place of residence as at the time the Wave 2 was conducted. Therefore the discrepancy

in the number of households sampled between the two waves. Precisely, 4716 households completed the interview during the Wave 2 visit.

Table 1 gives the summary statistics. It includes the proportion of households that reported the incidence of death and disability.

TABLE 1: DESCRIPTIVE STATISTICS OF HEALTH SHOCKS AND OUTCOME VARIABLES

Variable	Mean	Std. Dev.
Age (years)	27.6581	14.4507
Age square	973.7556	1205.3820
Work hours	5.4804	0.8358
Household Income	9.8284	1.5662
Death	0.0746	0.2627
No death	0.9254	0.2627
Disability	0.5304	0.4843
No disability	0.4696	0.4843
No formal education	0.0020	0.0400
Primary	0.3957	0.4181
Secondary	0.2409	0.3361
Tertiary	0.3614	0.4401
Male	0.4926	0.2099
Female	0.5074	0.2099
Married	0.4193	0.2290
Single	0.5807	0.2290

Source: Computed from GHS

## 4. Results

### 4.1. Effects of death and disability on worked hours

Two types of household worked hour's models (Fixed Effect and Random Effect) were estimated. Based on Hausman FE post estimation test for possible correlation between the regressors and effect, the FE model was found to be consistent as indicated by Chi-square statistic<sup>1</sup> which were significant for both equations (Disability and death models). Findings show a positive relationship between hours of work and deterioration in the activities of daily living (disability). This suggests that disability raises hours of work. This may partly

<sup>1</sup> Hausman FE test Chi-square test statistic value = 12.41; Prob > chi2 = 0.0534 for disability model & Chi-square test statistic value = 14.17; Prob > chi2 = 0.0278 for the death model, in line with these statistics, the FE coefficients are reported.

be explained by the fact that children, women and relatives have to modify their pattern of work to forestall the potential decline in earnings of the member who is incapacitated by ill-health disability.

Also, the fact that an incapacitated person may require more time to complete a given task can be the reason for the rising number of hours. Disability to any member of the household may reallocate resources within the household, for instance, more time will be devoted to income-earning activities at the expense of leisure. Similarly, assets and savings can be used to meet the immediate needs and future consumption of the household. This, however, harms households' income and overall wellbeing of the households. Intuitively, disability determines the choice, quantity and quality of calorie intake, thus influencing households' satisfaction. This finding tends to contradict the work of Jones (2008) that concludes that disability leads to a decline in labour market participation rate. Similarly, Ali (2014) found a significant decline in the productivity of households that experienced disability in Bangladesh. However, the prevalence of the informal sector and unskilled labour may justify the ease at which healthy member can substitute for a disabled person within the household. Meanwhile, in the case of the death of a household member, the estimated coefficient was positive but not statistically significant.

The findings could not reject the hypothesis that death in a household does not reduce the number of hours worked in a household. The result was consistent with the findings of Bales (2014) which used adult's illness and death of any aged person in the household and found that death sometimes does not impact negatively on labour supply. These results show that death and disability might not necessarily reduce the households' worked hours. This result implies intra-network of household support was able to make up for the number of hours lost to disability or death of income earners.

Among the covariates, the mean age of household's member had a direct influence on hours of work. The result shows that the older the household's member, the more the need for intra-household labour substitution to maintain the number of hours worked. Married households' head had a negative, but meaningful effect on the hours of work compared to households whose heads were not married or single. In the event of the death of a married household's head, the result was also positive. One percent change in the number of deaths was significantly associated with rising work hours of the household. This shows that household was able to substitute healthy members for the disabled or dead member, and was working more hours. Educational attainment of the household

head determines the ease at which labour is substituted in the face of disability or death, it is much easier for households whose head, highest educational attainment is primary than for those that attained higher education levels. Findings from the study further suggest that having secondary educational attainment increased the degree of labour substitutability within the household.

TABLE 2: IMPACT OF DISABILITY AND DEATH ON HOUSEHOLD'S HOURS OF WORK

Variables	(FE) Work Hours	(FE) Work Hours
HH head's Age (years)	0.0275 (0.0764)	0.1240*** (0.0340)
Disability	0.858* (0.451)	-
HH head is male	-1.091 (3.756)	-1.996 (2.174)
HH head attained primary	0.258 (0.784)	0.483 (0.307)
HH head completed secondary	-0.667 (0.635)	0.570* (0.291)
HH head is married	5.882** (2.679)	1.125 (1.431)
Death of HH head	-	-0.123 (0.283)
Constant	-12.27*** (3.038)	-10.83*** (1.759)
Observations	717	1,917
R-squared	0.363	0.148
F test	2.663 (0.0359)	3.386 (0.0041)

Notes: \*\*\*, \*\*, \* imply acceptance at 1%, 5% and 10% critical levels correspondingly. The coefficient in the table emanates from different regression equation.

Source: Authors' computation.

#### *4.2. Effects of disability and death on household's earnings*

The estimates from the specification for changes in household earning were reported in Table 3 for disability and death. The coefficient emanates from different regression estimation, although they all come from similar equation, therefore, two earning models were estimated (FE and RE). The Hausman<sup>2</sup> test revealed that the Random effect model is most suitable in the case of disability

<sup>2</sup> Hausman FE test Chi-square test statistic value = 1.98; Prob > chi2 = 0.9608. In line with this statistic, the Re coefficients are reported.

and households' earnings, while the reverse is the case when the models were estimated for death.

TABLE 3: EFFECT OF DISABILITY AND DEATH ON HOUSEHOLD'S EARNINGS IN NIGERIA

Variables	(FE) Income	(RE) Income
HH head's Age (years)	0.0532** (0.0214)	-0.00936 (0.00756)
Death of HH head	-0.407* (0.245)	-
HH head is male	-2.468* (1.324)	-0.253 (0.318)
HH head attained primary	9.391 (6.433)	3.157 (4.426)
HH head attained secondary	9.570 (6.427)	3.771 (4.420)
HH head attained tertiary	9.451 (6.430)	3.578 (4.417)
HH head married	-0.0752 (0.909)	-0.323 (0.451)
Disability	-	-0.148 (0.113)
Constant	0.489 (6.492)	7.006 (4.441)
Observations	2,302	748
R-squared	0.056	
F test	2.231 (0.0322)	
Wald test		14.49 (0.0431)

Notes: \*\*\*, \*\*, \* imply acceptance at 1%, 5% and 10% critical levels correspondingly. The individual coefficient in the table emanates from different regression equation.

Source: Authors' computation.

The first column shows the results for change in household's earnings as a result of the death of any household member. Death was negatively associated with income and statistically significant despite having a non-significant statistical relationship with work hours. The findings show that death was negatively associated with households' earning and the coefficient statistically significant in reducing households' income<sup>3</sup>. According to the fixed effect

<sup>3</sup> We multiplied the coefficient by 100 as income is in logarithm form (log - lin) and health shock measure was in absolute value (Gujarati, 2003).

estimate, monthly household income declined by 41% as a result of death experienced by household member. The negative and statistically significant effect of death suggests that the dead member was a net-contributor in the household and indicates that household faced with death could not fully adjust income. The result is in agreement with the work of Wagstaff (2007), that found that death of an active member of the household significantly reduces household earnings in Vietnam. However, Bales (2014) found an insignificant relationship between death and earnings and even reported an increase in wage income for households that show a non-significant relationship between death and labour supply.

Findings show no meaningful impact on household's earnings due to disability as evidenced by the statistical insignificance of the coefficient. The results further suggest that the effect of disability was not significant in explaining the change in the income of household despite the fact that the number of hours worked increase for household that experienced disability. The non-significant relationship could mean that households were able to substitute for labour efficiently. It may be possible for healthy individuals to take up the activities of the disabled member to preserve households' level of income. This tends to corroborate the findings that disability leads to a rising number of hours of work within the household.

#### *4.3. Effects of death and disability on medical spending*

The Hausman FE<sup>4</sup> post estimation Chi-square value affirmed the suitability of FE model over and above the RE model for both equations. The coefficient from the model found that households' medical expenses increase with disability illness and death. Disability had a direct relationship with medical spending and highly statistically significant coefficients' estimates, translating to about 45% increase in medical expenditure. A possible explanation of this finding is that medical spending increases as the number of disabled persons in the household increase as they sought medical care. This result is in line with Bales (2014) that concludes that the onset of disability increases medical spending.

Similarly, death was positively associated with medical spending and statistically significant. The result seems to suggest an increase in medical expenses by households that experienced death, this makes sense because

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<sup>4</sup> Hausman FE test Chi-square test statistic value = 15.77; Prob > chi2 = 0.0273 for disability model & Chi-square test statistic value = 23.11; Prob > chi2 = 0.0016 for the death model, in line with these statistics, the FE coefficients are reported.

such households might have incurred medical expenses before the death of the household member and might include funeral costs. This finding is in agreement with the work of Wagstaff (2007) in Vietnam that reported a significant relationship between death and medical expenses. Also, in Laos, Wagstaff & Lindelow (2013) found that death is associated with high medical expenditure as a result of costs incurred from the use of health-related facilities in caring for the sick member before death and funeral related expenses.

TABLE 4: EFFECT OF DEATH AND DISABILITY ON HOUSEHOLD'S MEDICAL EXPENSES

Variables	(FE) Medical expenses	(FE) Medical expenses
HH head's age (years)	0.0774** (0.0384)	0.0383** (0.0178)
Disability	0.452* (0.251)	-
HH head is male	0.309 (2.239)	-0.489 (1.149)
HH Head attained primary	-5.203 (10.61)	3.993 (6.473)
HH Head attained secondary	-5.046 (10.53)	4.186 (6.475)
HH Head attained tertiary	-5.671 (10.56)	3.901 (6.473)
HH Head is married	-4.602** (1.805)	-0.601 (0.883)
Death of HH head	-	0.772*** (0.220)
Constant	14.71 (10.57)	3.849 (6.507)
Observations	1,061	2,899
R-squared	0.194	0.055
F test	2.793 (0.0118)	3.197 (0.0027)

Notes: \*\*\*, \*\*, \* imply acceptance at 1%, 5% and 10% critical levels correspondingly. Individual coefficient in the table emanates from different regression equation.

Source: Authors' computation.

The result further showed that the medical expenditure incurred by households rises as the households' member advances in age. That is, households with older member tend to spend more on healthcare than households with a younger population. Moreover, households whose head are married were found to incur lesser medical expenses than those whose head is single.



## **5. Conclusion**

The findings confirm that the effect of death and disability on hours of work is mixed. Disability has a positive association with hours of work, while death has a negative effect on it. Earnings are negatively related to disability and death of a household member though only significant in the case of death. Surprisingly death and disability induced reduction in earnings despite not having a significant effect on hours of work, suggesting that intra-household labour adjustment cannot fully insure lost hours of work in the case of death. This may be due to compensating decreases in hours of work of other household members, changes in productivity, or the hiring of additional labourers to maintain income-generating activities but whose productivity is not sufficient to compensate for the loss in income owing to death or disability to a household member.

Furthermore, results reveal a positive relationship between death, disability and medical spending. The study shows that reductions in income coupled with increased health spending were both important channels reducing household welfare, therefore, it is imperative to strengthen the degree of financial assistance that could help subsidize medical care and alleviate the economic consequences of death and disability. This will help reduce the economic burden of disability and death on the households and help boost their welfare.

## **Biographical Notes**

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