Parental health shocks and schooling: The impact of mutual health insurance in Rwanda

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ABSTRACT

The goal of this study was to look at the educational spill-over effects of health insurance on schooling with a focus on the Rwandan Community Based Health Insurance Programme, the Mutual Health Insurance scheme. Using a two-person general equilibrium overlapping generations model, this paper theoretically analyses the possible effect of health insurance on the relationship between parental health shocks and child schooling. Individuals choose whether or not they want to incur a medical cost by seeking care in order to reduce the effect of health shocks on their labour market availability and productivity. The theoretical results show that, health shocks negatively affect schooling irrespective of insurance status. However, if the health shock is severe (incapacitating) or sudden in nature, there is a discernible mitigating effect of health insurance on the negative impact of parental ill health on child schooling. The results are tested empirically using secondary data from the third Integrated Household Living Conditions Survey (EICV) for Rwanda, collected in 2011. A total of 2401 children between the ages of 13 and 18 are used for the analysis. This age group is selected due to the age of compulsory education in Rwanda. Based on average treatment effect on treated we find a statistically significant difference in attendance between children with MHI affiliated parents and those with uninsured parents of about 0.044. The negative effect of a father being severely ill is significant only for uninsured household. For the case of the mother, this effect is felt by female children with uninsured parents only when the illness is sudden. The observed effects are more pronounced for older children. While the father's ill health (sever or sudden) significantly and negatively affects their working hours, health insurance plays appears to increase their working hours. The effects of health insurance extend beyond health outcomes.

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1. Introduction

In the absence of health and disability insurance, health shocks can potentially affect households due to the income uncertainties created (Flores et al., 2008). Health shocks are unpredictable leading to both short-term loss of incomes and poverty traps (Morduch, 1995; Wagstaff, 2007; Sun and Yao, 2010). The greatest economic costs associated with illness are medical care (direct costs) and the loss of income arising from reduced labour supply and reduced productivity (indirect costs), (Gertler and Gruber, 2002; Asfaw and von Braun, 2004). In order to smoothen

consumption over time, households tend to rely on several financial coping strategies (Morduch, 1995). Evidence suggests that low income households tend to finance a substantial portion of their healthcare through savings, credit and asset sales. Medical care is financed mainly through labour substitution (Sauerborn et al., 1996).

Long-term parental health shocks might impact the education of children (Edmonds, 2006) if they are seen as substitutes in the labour market or are required to work at home (family business and domestic chores). This may suggest that, in addition to schooling, some children will be required to work (either at home or elsewhere) to supplement household income (Jacoby and Skoufias, 1997; Dercon and Krishnana, 2000; Johnson and Reynolds, 2013). However, sudden parental health shocks might result in children missing school for a brief period as the household adjusts to the shock.

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Health insurance can help eliminate some direct costs, and depending on the effectiveness of treatment, some of the indirect costs mentioned above, making it possible for households to use their savings and other coping mechanisms to finance the sudden loss in revenue. For those with insurance therefore, a very large health shock would be needed to force households below the threshold point (i.e. below the minimum income level required to keep children in school). This threshold point can be described as the point beyond which the household faces catastrophic health expenditure (Xu et al., 2003).

Although studies on parental health and its impact on the child are few and far between, a very large body of literature exists on both the impact of parental death and income shocks on child schooling and household consumption. Studies on the effect of parental death (irrespective of the cause) on child labour find that, in general, the death of a parent has a negative impact on education and in cases where the cause of death is attributed to ill health, there is a lag in education with erratic school attendance, especially in poorer households (Bicego et al., 2003; Case et al., 2004; Yamano and Jayne, 2004; Gertler et al., 2004; Ainsworth et al., 2005; Evans and Miguel, 2007; Cas et al., 2014).

A recent study looking at the impact of parental health shock on schooling finds that only health shocks involving a father negatively affect school attendance while those involving a mother or other household members have no such effect (Alam, 2015). Bratti and Mendola (2014) on the other hand found that maternal health affects schooling in Bosnia and Herzegovina. Interestingly, Liu (2016) found that health shocks to either the head of the household or the spouse has a negative effect on school enrolment in rural China with insurance playing a mitigating role.

This paper builds on these different strands of literature by examining the effects of health insurance on the schooling of children. While there are other reasons why a child could miss school, including hunger, a lack of interest and not seeing the benefits of being in school among others, we focus on the parental health effect. A theoretical model is built in which a household is made up of two individuals, a representative parent and a child. The parent works and makes decisions for the household. Health insurance affiliation and healthcare utilisation are treated as optional with a decision on the former taken before any health shocks are experienced. Health shocks affect the time the parent spends working and hence income earned. Theoretical results show that the impact of a parental health shock on the child's schooling depends on the intensity of the shock and whether the parent chooses to seek care or not, with health insurance playing a mitigating role only if the shock severely affects the productivity of the parent. Chronic shocks (shocks lasting over a month) are not found to have a strong impact on the child's schooling time, irrespective of the parent's insurance status.

We test these results using data from the 2011 Rwandan third Integrated Household Living Conditions Survey (EICV 3). The focus is on adolescents of secondary school going age (between 13 and 18 years). Propensity scores are used to match children based on the insurance status of their parents. We study the average treatment effects of parental insurance affiliation on schooling, the effect of sudden parental health shocks on children's schooling, and the effect of health shock severity (incapacitating health shocks) on schooling. Empirical results indicate that health shocks to the father have a significant negative effect on schooling when the father is uninsured. The effect is insignificant if the father is insured. In addition, the empirical results indicate that the severity of the disease and its sudden onset are more likely to affect schooling than it becoming chronic.

To our knowledge, this is the first paper to consider the micro-dynamics of health expenditures and their effects on productivity and hence on household spending and incomes. In the presence of health shocks, the first response mechanism of households is to seek medical care in order to reduce the effect these shocks will have on their labour market productivity and hence incomes. Doing so might protect them against falling into a poverty trap. Their productivity might not be affected by the shock, especially if their medical care costs are co-financed rather than self-financed. However, when their medical expenditure is too high, they are more likely to fall into financial difficulty, with the chances of escape being slim if healthcare does not help them to recover fully. Our results add to the growing literature on the impact of parental health on child outcomes.

The rest of the paper proceeds as follows: the next section presents the theoretical model, providing hypotheses which are then tested in section 3. Results are presented in section 4, concluding with a discussion in section 5.

2. Conceptual framework

Let us consider a two-period overlapping generations (OLG) model in which parents make decisions for their children. The household consists of one parent and one child. While there are other reasons for investing in their children's education, including the intergenerational transfer of wealth, we make the simplifying assumption that parents invest in the education of their children out of altruism. This helps us obtain our results more easily. Accounting for the other reasons, while complicating the model, would not change the general results we obtain. Children have one unit of time which they spend either in school ($s_t^{x,y}$) or working ($l_t^{x,y}$). Note that child labour in this case includes domestic activities. Thus the time the child spends in school is defined as

$$s_t^{x,y} = 1 - l_t^{x,y} \tag{1}$$

where x, represents the parental insurance status ($u = uninsured$, $i = insured$) and y the health status ($n = not\ sick$, $s = sick$). A working child earns a fraction ($0 < \gamma \leq 1$) of the income of the parent for the same hours worked. Thus the monetary earning of the child (ω_t^c) is defined as

$$\omega_t^c = \gamma l_t^{x,y} \omega_t \tag{2}$$

where ω_t is the wage rate and $s_{t-1}\omega_t$ the wage earned by the parent. The parent has one unit of time which he/she spends in the labour market working for a wage. This labour time of the parent is affected by their health status. If they fall sick, the time spent working ($d_t^{x,y}$) can be defined as

$$d_t^{x,y} = 1 - \overline{h}f(m_t^{x,y}) \tag{3}$$

where $\overline{h} \geq 0$ is the exogenous fixed time cost of the health shock, $f(.)$ is the loss in labour time as a result of a health shock and is dependent on treatment costs ($m_t^{x,y}$) with $f'(.) < 0$ and $f''(.) > 0$. In addition, $0 \leq f(.) \leq 1$. When $f(.) = 1$ and $\overline{h} = 1$, the parent does not work, when $\overline{h} = 0$ there is no effect of the health shock on the parent's labour time or there is no health shock. Finally when $(.) = 0$, medical spending has succeeded in eliminating the impact of the health shock on parental labour time. Treatment costs reduce the effect of the health shock on the time available for work. Therefore, in the face of a health shock, parents can choose to either incur a cost in order to minimise the effect of the health shock on their working time or do nothing. The assumption here is that parents invest in their health because of the adverse effect it might have on the education of their children.

Now let us assume the existence of an insurance market where,