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Health, Enterprise, and Labor Complementarity in the Household☆

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ABSTRACT

We study the role of household enterprise as a coping mechanism after health shocks. Using variation in the cost of traveling to formal sector health facilities to predict recovery from acute illness in Tanzania, we show that individuals with prolonged illness switch from farm labor to enterprise activity. This response occurs along both the extensive (entry) and intensive (capital stock and labor supply) margins. Family members who are not ill exhibit exactly the same pattern of responses. Deriving a simple extension to the canonical agricultural household model, we show that our results suggest complementarities in household labor.

1. Introduction

Health shocks can have large negative effects on income and productivity (Schultz and Tansel, 1997; Strauss and Thomas, 1998; Thomas et al., 2006; Wagstaff, 2007; WHO, 2000). Households in low-income contexts are particularly vulnerable: smoothing mechanisms like savings, credit, insurance, and informal financial networks often function poorly in these contexts (Dupas and Robinson, 2013; Kochar, 1999, 2004; Pande and Burgess, 2005; Paxson, 1992; Townsend, 1994). Moreover, income-generating activities within the household are often intertwined: parents and children work together on family farms, and extended family members pool resources in business (Adhvaryu et al., 2013; Benjamin, 1992; Dercon and Krishnan, 2000; Shocks affecting one family member thus spill over onto others, and could amplify negative impacts (d'Adda et al., 2009, Graff Zivin et al., 2009). Facing significant constraints, how do poor households cope with health shocks? Do the effects of shocks indeed spill over onto other household members, and if so, why? And can policy intervention mitigate negative impacts?

We study these questions in the context of agricultural households in Tanzania. Most households in our sample are primarily farmers with small plots; they grow staples along with coffee, a cash crop. Acute illnesses (manifesting as fevers and coughs) are highly prevalent: 75 percent of households had at least 1 sick member in the month preceding interview. Recovery is not always quick: more than 40 percent of individuals who reported recent illnesses were still ill at the time of survey.

How does acute illness affect these farmers' livelihoods? Identifying households' responses to health shocks is difficult because of the potential endogeneity of these shocks. Individuals without access to proper nutrition and health technologies, or without adequate knowledge of and preference for health, may be more likely to experience health shocks or might experience shocks with greater intensity (Grossman, 2000). We use exogenous variation in the (short-term) costs of access to formal health care–at government and NGO clinics and facilities–following acute illness to predict the speed of recovery (Adhvaryu and Nyshadham, 2012a). Specifically, we instrument for the utilization of formal care by sick household members using the interaction of proximity to health facilities and rainfall during the time of illness, controlling for both main effects in flexibly non-linear forms as well as the interaction between rainfall and the proximity to other resources. Individuals treated at the formal sector, as opposed to self-medicating or seeking no care, recover significantly faster: formal-sector care reduces the likelihood of prolonged illness by 45 percentage points.

Next, we look at how households cope during illnesses. Given the financial constraints these households face, and the lack of insurance mechanisms to smooth consumption in this context, how do house-

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holds compensate for the productivity and income losses associated with health shocks? We show that individuals who are slow to recover switch from farm labor to enterprise activity. This pattern is consistent with the idea that illness is a sector-biased productivity shock, in that it affects productivity more in sectors like agriculture, which demand greater physical effort. While sick, the individual is more productive in enterprise than on the farm. This response occurs on both the extensive (entry) and intensive (capital stock and labor supply) margins. Merchant enterprises exhibit the largest response.

Given the large sectoral shift in labor supply for sick individuals, we ask whether other household members change their behavior, as well. In other words, do prolonged illnesses spill over onto those who are not sick? These spillovers could arise through the many ways in which decision-making and allocation in the household are intertwined, for example, through joint production on the farm and in enterprise activities, time spent caring for the sick, or shifts in the household budget constraint (d'Adda et al., 2009; Graff Zivin et al., 2009; Pitt and Rosenzweig, 1990; Pitt et al., 1990).

We find evidence of substantial spillovers. Family members who are not ill exhibit exactly the same pattern of enterprise entry and labor supply responses. That is, prolonged illnesses cause shifts away from farm labor toward enterprise activity for the whole household. We develop a simple extension to the canonical agricultural household model to interpret these joint labor reallocation patterns. Our findings, together with the assumptions embedded in this model, suggest that complementarities in household labor exist in at least one sector of production. This complementarity between labor inputs increases the potential productivity loss from acute illness in the absence of labor reallocations, and in turn, increases the importance of enterprise as a coping mechanism.

We add to the rich literature on health and health care in developing countries. Health shocks are frequent in poor households, and have outsized impacts on productivity (Dercon and Krishnan, 2000; Kochar, 2004; Schultz and Tansel, 1997; Strauss and Thomas, 1998; Thomas et al., 2006). Given that health insurance mechanisms are still weak or nonexistent in many developing contexts, informal networks (including family networks) play a major role in coping with illnesses (De Weerdt and Dercon, 2006; Lindelow and Wagstaff, 2005; WHO, 2000). We demonstrate that treatment in the formal health care sector has a large impact on duration of illness, and further, on labor supply decisions for the sick individual and her household.

More broadly, we contribute to our understanding of the way in which poor households cope with shocks. Agricultural incomes are highly volatile, and often depend on factors completely out of households' control, like natural disasters, rainfall, and commodity market fluctuations (Adhvaryu et al., 2013; Deaton, 1999; Jensen, 2000; Yang and Choi, 2007). Where financial markets are weak, and price protections or insurance mechanisms are imperfect, household incomes are even more uncertain (Cole et al., 2013; Gertler et al., 2009; Karlan et al., 2012). We show that intermittent enterprise activity plays a significant role as a coping mechanism. This is consistent with previous studies on agricultural households' labor supply adjustment to shocks (see, e.g., Fields (1975); Kochar (1999)), and with the fact that a majority of agricultural households in developing countries operate non-farm enterprises (Ellis, 1998, 2000).

Finally, we add to the policy debate on access to the formal health care sector in developing countries. Government-operated health facilities tend to be farther away than self-treatment options like drug kiosks and pharmacies, and often lack in quality in many low-income contexts (Das et al., 2008). It is not clear, therefore, that removing barriers to formal sector access would be beneficial for patients. Our study strongly implicates a role for such policies. Our results suggest that not only do health outcomes improve (as also shown in Adhvaryu and Nyshadham (2012a, 2012b)), but labor supply shifts substantially, as well, both for the sick individual and other members of his household. The benefits of policies that improve access to formal sector care thus include this sizable and previously unmeasured spillover onto household labor supply.

The remainder of the paper is organized as follows. Section 2 describes our data set and construction of important variables. Section 3 presents our empirical strategy and discusses its validity. Section 4 presents results from the empirical exploration of enterprise responses to health shocks and access to care. Section 5 discusses possible mechanisms (such as labor complementarity) and references the development in section Appendix A of an appropriate theoretical context in which to interpret the empirical results. This section also presents additional empirical results for the sake of comparing possible mechanisms. Finally, section 6 concludes.

2. Data

2.1. Overview

This study uses survey data from the Kagera region of Tanzania, an area west of Lake Victoria, and bordering Rwanda, Burundi and Uganda. Kagera is mostly rural and primarily engaged in producing bananas and coffee in the north, and rain-fed annual crops (maize, sorghum, and cotton) in the south. The Kagera Health and Development Survey (KHDS) was conducted by the World Bank and Muhimbili University College of Health Sciences (MUCHS). The sample consists of 816 households from 51 "clusters" (or communities) located in 49 villages covering all five districts of Kagera, interviewed up to four times, from Fall 1991 to January 1994, at 6 to 7 month intervals. The randomized sampling frame was based on the 1988 Tanzanian Census.[1] KHDS is a socio-economic survey following the model of previous World Bank Living Standards Measurement Surveys. The survey covers individual-, household-, and cluster-level data related to the economic livelihoods and health of individuals, and the characteristics of households and communities. In the following paragraphs, we outline the variables we use in our analyses.

2.2. Health variables

In the health module of the KHDS, all household members are asked about chronic illnesses and acute illness episodes; care sought for these episodes; and current illness (at the time of survey).[2] As our main sample restriction, we use information on whether households contained at least one sick member (i.e. a member who reported having been sick in the last 14 days with an it acute illness) and one non-sick member. We collapse our observations to the household-year level, by constructing within-household-year means for important health, enterprise, and labor supply variables. We also construct enterprise and labor supply means separately for the subsamples of ill and non-ill members of each household. Our means are constructed using the number of *productive* household members, which is defined as the number of household members who answered the time use survey (all individuals above the age of 7). We restrict the sample in this way so that the labor means do not erroneously take into account household members for whom the time use survey was not asked.

Table 1 shows summary statistics for the Kagera sample. The number of household-year observations with at least one sick and one non-sick household member is 1932; this comprises roughly 75% of the household sample. Within these households, 42% of sick individuals report still being ill at the time of survey.

[1] A two-stage, randomized stratified sampling procedure was employed. In the first stage, Census clusters (or communities) were stratified based on agro-climactic zone and mortality rates and then were randomly sampled. In the second stage, households within the clusters were stratified into "high-risk" and "low-risk" groups based on illness and death of household members in the 12 months before enumeration, and then were randomly sampled.

[2] In the case of individuals below the age of 15, the primary caretaker of the child is asked to answer on the child's behalf.