Health Shocks, Family Structure, and Child School Enrollment in Ethiopia

Keith Barnatchez

EC475

September 9, 2020

Abstract

I analyze the influences on child educational investment in response to health shocks within the family. Using data from the Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA) in Ethiopia, I find that female child school attendance is positively related to the presence of a spouse in the household. I find no evidence of a similar effect for males, and find no evidence that the health of a child's caregiver is associated with school attendance or enrollment. Further, I find no evidence that these two effects – caregiver health and the presence of a spouse – interact. My significant findings are consistent with findings in the literature, though data limitations in this study call for further analysis in determining whether these effects do interact.

1 Introduction

Health shocks, especially for households in developing countries, generate considerable disruptions to consumption and investment decisions every year. In response to sudden surges in health care expenditures brought about by health shocks, households must reallocate their resources to accommodate the shock. Among the many forms of consumption/investment that households must consider altering in the face of a health shock is educational investment. A common response for households facing a health shock is to pull children from school and have them take on additional household duties/supply labor in order to help mitigate the effects of the shock. Relative to the research conducted on the responses of household education investment in response to investment, there has been a paucity of studies regarding how family characteristics, such as income and the presence of both parents, are related to educational investment in response to a health shock. Using data from The Living Standards Measurement Study, I find moderate evidence that caregiver presence influences child school attendance, but find no evidence that the presence of multiple caregivers interacts with the effect of caregiver health shocks.

The purpose of this study is to examine the impact of familial structure on educational investment in the event of a health shock suffered by a parent. Specifically, I examine whether children from one-parent households are more likely to be withdrawn from school in the event of a health shock suffered by a parent, relative to children from two-parent households. Consistent with existing evidence in the literature, I find moderate evidence that children from households in which two caregivers[1] are present are less likely to miss time in school. I find no evidence, however, that the health of a child's caregivers significantly influences their attendance or enrollment status. Further, I find no evidence that these two effects interact – that is, I find no evidence that the number of caregivers in a household influences the effect of a health shock on a child's educational status.

Conditional upon knowing the true relationship between family structures, health shocks

[1] I use a particular definition of what constitutes a caregiver in this study. See section 3 for details.

and child education, there are numerous potential policies that could improve welfare. Especially in developing countries, in which uptake of preventative health technologies is often low, an understanding of this relationship could better inform governing bodies which households would most highly benefit from preventative health information campaigns/subsidies in the event that large-scale implementation is not possible.

2 Literature Review

There have been multiple studies considering household education investment in response to health shocks – both with respect to hours of schooling and total educational expenditures. Glick et al. (2016) estimate the effects of health, income and asset shocks on school attendance amongst families in Madagascar, finding that all three shocks increase the probability of a child dropping out of school. In particular, the authors find that mothers/fathers becoming sick significantly increases the probability that their child is not enrolled in school. Notably, the authors also find that, conditional on higher levels of parental education, children are less likely to reduce time in school in the face of a health shock relative to children with less-educated parents. In a study primarily focused on the causal effects of health shocks on consumption, Mohanan (2013) uses a quasi-experimental design to show that health shocks have a negative, borderline significant effect on educational expenditures[2]. Notable among Mohanan's findings is that consumption of other forms (housing, food and festivals) is not significantly effected by a health shock.

There is an existing, albeit limited, literature regrading family structure and child school enrollment. Zimmerman (2003) found that foster children in South Africa were not less likely than others to be enrolled in school. Additionally, Zimmerman found that foster children often moved from households where it was comparatively more difficult to remain enrolled in school. In a study analyzing the effects of family instability[3] on later educational investment,

[2]These expenditures are for supplies pertaining to school, such as books, clothes/uniforms, etc.

[3]The authors in this study define instability in the context of the caregivers present in their main

Fomby (2013) found that instability in family structure significantly lowers the odds of a child ultimately attaining a college degree. Focusing the effect of parental deaths on school enrollment, Case et al. (2004) show that orphans in Africa are less likely to be enrolled in school, and that much of this finding is driven by their higher likelihood of living with distant relatives and non-related caregivers.

The findings from these papers suggest that education may be one of the first forms of expenditure that households cut back on in the face of a health shock, and that this response is not limited to expenditures on educational goods, but also on time spent in school by children of the household. Further, these studies suggest that a child's schooling status is closely tied to the structure of his/her family. What is left to be determined is how these two effects *interact* – that is, if the effects of health shocks are different for two-caregiver vs. single-caregiver households. My paper addresses this gap in the literature.

3 Data

My data comes from The Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA). The LSMS-ISA is a system of panel household surveys administered to eight countries in Africa, with data from the surveys publicly available. I chose to use data from surveys administered in Ethiopia, as there is a considerable amount of variability in the presence of spouses within this dataset. The Ethiopian dataset has three waves (2011-2012, 2013-2014, 2015-2016). While the focus of these surveys is on the link between households and agriculture, there is a rich set of information regarding health status and educational enrollment status for each respondent. The raw dataset is at the individual level, with linkages to households that allow for me to identify relationships to the household head. When the survey is administered to a household, the head of the household fills in the basic information for each member of the household (e.g. name, age), and, most relevant for this study, each

household. For example, children with divorced parents, or a single parent with no consistent second caregiver, are defined as relatively unstable.

child's educational information is filled in by the household member that is most able to accurately provide the information.[4]

Along with linkages to the household head, the LSMS-ISA links each household to community-based enumeration areas. For each area, there is data for key institutions/services available to its members, such as microfinance institutions, health posts, and public schools. As educational responses to health shocks are likely tied to credit access, health services and the vicinity of public schools, I control for each of these variables within my model.

Table 1 displays summary statistics for the variables used in the model, using wave 3 as the sample. Statistics for waves 2 and 1 are not displayed, but are similar to the ones from wave 3. The mean age for respondents across all 3 waves was 9.88, and age is roughly uniformly distributed across all 3 waves. I proxy health shocks with self-reported health and deaths in the household. Specifically, I designate that an individual suffers a health shock in the event that they report experiencing poor health in the month prior to the survey. Summary statistics for this variables, as well as each of the other model variables, are displayed in table 1.

While the LSMS survey data is remarkably detailed, it has some shortcomings that are of note. For one, while there are linkages identifying the relationship between each member of a household to the household head, there is no linkage identifying the caregivers of any children in a given household. As a result, I make the assumption that the household head and his/her spouse (if present) function as the caregivers for any children within their household. Further, while the more recent survey waves identify deaths of household members, which would effectively allow me to estimate the effect of a caregiver death on schooling outcomes, the original wave does not identify deaths for each individual in the household. All three waves do, however, identify whether the main earner of the family died in the past year. I allow for this variable to be a control within the models I run, but it should be noted that this is not an ideal estimate of the effect of caregiver deaths on schooling outcomes.

[4]This is often the mother when she is present.

In a similar vein, it would be desirable to analyze the impact of other, longer term health shocks on schooling status. Unfortunately, there is no consistent measure of long-term health shocks across all three waves of data. While the earlier waves include data on whether subjects reported poor health for bouts exceeding 3 months in the year preceding the survey, the most recent wave removed this question. There are questions that measure the total number of consultations with health agencies over the year prior to the survey, but these variables promote concerns of endogeneity as being able to consult a health agency is contingent upon having access to one. As a result, I am only able to use the death of the household's main earner as my measure of a shock with anticipated long-run implications, but acknowledge that the available data restricts me from using better measures.

Table 2 presents the crude relationship between caregiver health and one of the main outcomes of interest, school attendance. Across all three waves, children with at least one caregiver who reported bad health in the prior month were 34.9 percent more likely to be absent from school for more than a week in the prior month relative to children whose caregivers did not report poor health. The following section examines this relationship further, under the inclusion of various control variables and model specifications.

TABLE 1: Summary statistics for wave 3

Variable	**Mean**	**(Std. Dev.)**	**N**
Male	0.506	(0.5)	7695
Enrolled in school	0.926	(0.262)	5453
Absent $\geq$ 1 week last month	0.084	(0.277)	5453
Child reported poor health in past month	0.067	(0.249)	7574
$\geq$ 1 of child's caregivers reported poor health in past month	0.247	(0.431)	7701
Main earner died in past year	0.018	(0.135)	7701
Spouse present	0.775	(0.417)	7701
Parent present	0.857	(0.35)	7701
Age of HH head	45.856	(12.474)	7701
Nominal annual consumption per adult (thousands)	5.865	(6.134)	7320
Access to micro-finance institution	0.308	(0.462)	7663
Access to health pose	0.809	(0.393)	7374
Distance to closest school (km)	0.872	(3.588)	7684

TABLE 2: Caregiver health and child school attendance

	Absent ≥ 1 week last month		
≥ 1 caregiver with bad health	No	Yes	Total
No	9,234	768	10,002
Yes	4,372	505	4,877
Total	13,606	1,273	14,879

TABLE 3: Changes over survey period

Variable	**Share**	**(Std. Dev.)**	**N**
Death of main earner during survey period	0.052	(0.222)	10812
Change in the presence of spouse	0.133	(0.339)	10812
Change in enrollment status	0.200	(0.400)	10812

4 Estimation approach and results

I estimate the effect of parental health shocks in which the primary outcome of interest is schooling status. Let $S_{i,c,h,t}$ be an indicator variable for the schooling status of child i from household h in community c, observed during wave t. While logistic regression is commonly employed for analyzing the outcomes of binary variables, my key relationship of interest is between $S_{i,c,h,t}$ and the interaction term between spousal presence and the instance of a health shock. Given the underlying nonlinear function behind logistic models, the interpretation of coefficients in this case would not be straightforward. As a result, I estimate the relationship between these two variables with linear probability models. Provided an observation with a given set of characteristics, his/her education outcome is given by

$$S_{i,c,h,t} = \alpha + \gamma shock_{h,t} + \beta(shock_{h,t} \times spouse_{h,t}) + \theta \boldsymbol{X}_{i,c,h,t} + \mu_i + \delta_t + \epsilon_{i,c,h,t} \tag{1}$$

Here, $shock_{h,t}$ is an indicator variable for whether one of the child's caregivers reported poor health in the past two months, $spouse_{h,t}$ is an indicator variable for whether there is a spouse present in the household of child i in time t, $\boldsymbol{X}_{i,h,t}$ is a vector of controls, and μ_h and δ_t denote individual and time random effects, respectively. All of the control variables can be found in table 1.

As my main models identify variation in schooling status off of within-child changes, it is useful to know what fraction of children experience changes in enrollment or spousal status, as well as what fraction of children experience the death of the main earner of their family within the 3 waves of the survey. Table 3 displays the share of children that experience a change in schooling/spousal status, as well as the share of children experiencing a the death of the family's main earner. We see that there is considerable variability across all three variables. Most notably, 20 percent of the children within the sample experienced a change in their enrollment status within the 3 survey waves. While much of this may be driven by children reaching a sufficiently high level of schooling that their family decides to end their enrollment, there is still likely a large amount of variability that can be explained by health shocks and spousal status.

I estimate various forms of equation (1). In some specifications, I pool all observations, while in more detailed specifications I employ individual and wave fixed effects. In my most detailed specifications, I include both fixed effects and an interaction term for spousal presence and health shock, which is the variable of interest. I estimate the expected outcome of both child school enrollment and presence in school within the month prior to the survey. As responses to shocks are likely to differ by gender, I run each regression separately for males and females.

I report the results of estimations where the dependent variable is attendance in the past month in tables 4 (females) and 5 (males). The results for models regressed on school enrollment status are displayed in tables 6 (females) and 7 (males).

We can first examine the results in table 4 (all females), where the outcome variable is whether the child missed at least one week of school in the previous month. In the most detailed model, model (4), we see that, all else in the model equal, the probability that a female child who lives in a household with a spouse present (henceforth referred to as a spouse-house) was absent from school in the month prior to the survey is an estimated 7.48 percentage points lower than a female child not living in a spouse-house. Continuing to refer

TABLE 4: Child absent from school ≥ 1 week last month: females

	Baseline models		Models with interaction	
	(1)	(2)	(3)	(4)
Caregiver poor health	0.0064	0.0033	0.0019	-0.0096
	(0.0075)	(0.0129)	(0.0154)	(0.0277)
Spouse present	-0.0114	-0.0696*	-0.0133	-0.0748*
	(0.0085)	(0.0279)	(0.0101)	(0.0296)
Age	-0.0014	-0.0069*	-0.0014	-0.0069*
	(0.0013)	(0.0032)	(0.0013)	(0.0032)
Child poor health	0.1759***	0.1867***	0.1759***	0.1869***
	(0.0116)	(0.0195)	(0.0116)	(0.0195)
Parent present	0.0115	-0.0163	0.0114	-0.0158
	(0.0110)	(0.0410)	(0.0110)	(0.0410)
Age of HH head	-0.0003	-0.0026*	-0.0003	-0.0026*
	(0.0003)	(0.0013)	(0.0003)	(0.0013)
Community access to health post	0.0176	0.0518*	0.0177	0.0521*
	(0.0092)	(0.0218)	(0.0092)	(0.0218)
Distance to nearest school (km)	0.0001	0.0006	0.0001	0.0006
	(0.0007)	(0.0010)	(0.0007)	(0.0010)
Access to micro-finance institution	-0.0122	0.0108	-0.0122	0.0108
	(0.0075)	(0.0162)	(0.0075)	(0.0162)
Nominal consumption per adult	-0.0004	0.0022	-0.0004	0.0021
	(0.0006)	(0.0016)	(0.0006)	(0.0016)
Spouse present × health shock			0.0058	0.0163
			(0.0174)	(0.0309)
N	6425	6425	6425	6425
R^2	0.039	0.055	0.039	0.055

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 5: Child absent from school ≥ 1 week last month: males

	Baseline models		Models with interaction	
	(5)	(6)	(7)	(8)
Caregiver poor health	0.0136	-0.0022	-0.0013	-0.0229
	(0.0074)	(0.0126)	(0.0154)	(0.0281)
Spouse present	-0.0132	-0.0464	-0.0192	-0.0545
	(0.0085)	(0.0277)	(0.0101)	(0.0294)
Age	-0.0025*	-0.0034	-0.0025*	-0.0033
	(0.0012)	(0.0032)	(0.0012)	(0.0032)
Child poor health	0.1349***	0.1655***	0.1350***	0.1657***
	(0.0116)	(0.0204)	(0.0116)	(0.0204)
Parent present	0.0204	-0.0645	0.0197	-0.0666
	(0.0112)	(0.0441)	(0.0112)	(0.0441)
Age of HH Head	-0.0001	-0.0000	-0.0001	-0.0000
	(0.0003)	(0.0013)	(0.0003)	(0.0013)
Community access to health post	0.0178	0.0252	0.0178	0.0254
	(0.0092)	(0.0207)	(0.0092)	(0.0207)
Distance to nearest school	-0.0005	0.0003	-0.0005	0.0003
	(0.0008)	(0.0011)	(0.0008)	(0.0011)
Access to micro-finance institution	-0.0194**	0.0136	-0.0194**	0.0139
	(0.0074)	(0.0157)	(0.0074)	(0.0157)
Nominal consumption per adult in HH	-0.0005	0.0012	-0.0005	0.0012
	(0.0008)	(0.0016)	(0.0008)	(0.0016)
Spouse present × health shock			0.0190	0.0257
			(0.0173)	(0.0311)
N	6761	6761	6761	6761
R^2	0.025	0.032	0.026	0.032

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 6: Child school enrollment: females

	(9)	(10)	(11)	(12)
Death of main earner	0.0157	0.0002	0.0305	0.0009
	(0.0237)	(0.0506)	(0.0287)	(0.0585)
Spouse present	0.0085	-0.0435	0.0090	-0.0434
	(0.0095)	(0.0363)	(0.0095)	(0.0366)
Age	-0.0127***	-0.0193***	-0.0127***	-0.0193***
	(0.0014)	(0.0035)	(0.0014)	(0.0035)
Caregiver poor health	-0.0288*	-0.1041***	-0.0285*	-0.1041***
	(0.0133)	(0.0293)	(0.0133)	(0.0294)
Parent present	0.0353**	0.0698	0.0354**	0.0698
	(0.0123)	(0.0550)	(0.0123)	(0.0551)
Age of HH head	-0.0002	-0.0007	-0.0002	-0.0007
	(0.0003)	(0.0014)	(0.0003)	(0.0014)
Community access to health post	-0.0238*	0.0121	-0.0241*	0.0121
	(0.0100)	(0.0347)	(0.0100)	(0.0347)
Distance to nearest school (km)	0.0001	-0.0014	0.0001	-0.0014
	(0.0010)	(0.0020)	(0.0010)	(0.0020)
Access to micro-finance institution	0.0241**	-0.0076	0.0238**	-0.0076
	(0.0085)	(0.0222)	(0.0085)	(0.0222)
Nominal consumption per adult	0.0005	0.0044	0.0005	0.0044
	(0.0006)	(0.0024)	(0.0006)	(0.0024)
Spouse present × death of earner			-0.0449	-0.0025
			(0.0494)	(0.1071)
N	4381	4381	4381	4381
R^2	0.026	0.065	0.027	0.065

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 7: Child school enrollment: males

	(13)	(14)	(15)	(16)
Death of main earner	-0.0264	0.0623	0.0411	0.0494
	(0.0279)	(0.0572)	(0.0377)	(0.0753)
Spouse present	0.0001	-0.0360	-0.0006	-0.0367
	(0.0105)	(0.0368)	(0.0104)	(0.0369)
Age	-0.0187***	-0.0125***	-0.0187***	-0.0125***
	(0.0015)	(0.0035)	(0.0015)	(0.0035)
Caregiver poor health	-0.0212	-0.0132	-0.0191	-0.0131
	(0.0141)	(0.0323)	(0.0141)	(0.0323)
Parent present	0.0436**	-0.0321	0.0431**	-0.0317
	(0.0136)	(0.0597)	(0.0136)	(0.0598)
Age of HH head	-0.0006	0.0011	-0.0006	0.0011
	(0.0003)	(0.0016)	(0.0003)	(0.0016)
Community access to health post	-0.0207	0.0246	-0.0205	0.0246
	(0.0111)	(0.0315)	(0.0111)	(0.0315)
Distance to nearest school	-0.0016	-0.0018	-0.0016	-0.0018
	(0.0011)	(0.0026)	(0.0011)	(0.0026)
Access to micro-finance institution	0.0292**	0.0349	0.0295**	0.0347
	(0.0090)	(0.0219)	(0.0090)	(0.0219)
Nominal consumption per adult	0.0001	-0.0014	0.0000	-0.0013
	(0.0009)	(0.0023)	(0.0009)	(0.0023)
Spouse present × death of earner			-0.1455**	0.0272
			(0.0547)	(0.1034)
N	4555	4555	4555	4555
R^2	0.045	0.024	0.047	0.024

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

to model (4), we see that a female child reporting poor health in the month in the month prior to the survey is associated with an 18.69 percentage point increase in the probability that she missed at least of week of school in the month prior to the survey.

Considering the equivalent model for males (model (8) in table 5), we see that, for male children, suffering from poor health individually is associated with a 16.57 percentage point increase in the probability of being absent for more than a week in the previous month (all else in the model equal). Conditional on a caregiver suffering a health shock, the model predicts that the additional effect of the caregiver health shock for male children living in a spouse-house is a 2.57 percentage point increase in the probability of their child having an extended absence from school. The model predicts the net effect of a health shock for spouse-house male children is essentially 0.

Finally, we can consider model 12 (females), where the outcome variable is enrollment. We see that (all else in the model equal) a one year increase in a female child's age is associated with a 1.93 percentage point decrease in the probability that she is enrolled in school. Relative to children who do not have a parent present in their household, the model predicts that a child whose parent is present will have a probability of being enrolled that is 6.98 percentage points higher, all else equal.

5 Discussion

I first consider results for models 9-16, where the outcome variable is enrollment status. When controlling for within-child changes over time, I find no evidence that the interactions between health shocks and spousal presence, the main relationship of interest, are significantly related to either metric of schooling outcome. When I pool the data, I find a peculiar result for male children when the outcome variable is enrollment and the interaction is between the death of the main earner and spousal status: the interaction effect of these variables is estimated to be -0.1455, and significant at the 5 percent level. In other words, the model

estimates that, conditional on a health shock, the additional effect of the health shock is a 14.55 percentage point drop in the probability that the child was enrolled in school at the time of the survey. There is no significant interaction effect observed for females, regardless of whether I use fixed effects or pool the data.

While this result initially appears unintuitive, it is plausible that the death of a main earner may cause a male child/adolescent to leave school to pursue work in order to fill in the gap left by the death. If the spouse is present and can function as a caregiver, this makes such a transition feasible. In the event that no spouse is present, it is possible that a male child may pool additional household responsibilities with other family members, but not leave school to search for work.

Shifting focus towards models 1-8, where the outcome variable is school attendance in the month prior to the survey, I consistently find across all 8 models (for both males and females) that spousal presence is associated with a lower probability of absence in the month prior to the survey. This association is only significant (at the 10% level) in models 2 and 4, however, where I include fixed effects and only use females in the sample – this suggests that this relationship is not robust to alternative specifications. While not significant in any case for males or females, I find that the estimated interaction effect (spousal presence $\times$ health shock) has the opposite expected sign in every case that it is estimated. While this may suggest that, conditional on a health shock suffered by a caregiver, students are less likely to miss school, further studies with better linkages between caregivers and children are needed to confirm such a relationship. It is also important to emphasize that caregivers are defined in this paper as either the household head or the head's spouse – this is likely biased from the true relationship between caregiver health and child schooling.

Despite the puzzling results, there are some consistent findings that are consistent with the literature. Across all models, age is negatively associated with attendance and enrollment – the magnitude and significance of this relationship is stronger with respect to enrollment. Similarly, a child exhibiting poor health is negatively associated with both enrollment and

attendance, and the magnitude and significance of this relationship is stronger for females, consistent with the findings that females are more likely to reduce schooling in the event of various shocks.

6 Conclusion

Educational investment early in the life of a child is essential for their development and success later in life. However, a child's schooling status is subject to shocks that are often out of their control. I have found weak evidence that the presence of a spouse increases the likelihood that a female child will not miss significant time in school. I find no evidence of such an effect for males, and, further, I find no evidence that there is a relationship between spousal presence and enrollment status, after controlling for numerous confounding influences. In a similar vein, I find no significant evidence that caregiver health shocks (either from reported poor health, or reported death) are associated with child school attendance or enrollment. Most importantly to this study, I find no evidence of a significant interaction effect between spousal presence and caregiver health shocks, on either child enrollment or school attendance.

My study highlights the need for stronger data linking children to their *caregivers*, as well as their parents. While I was able to proxy links between children and caregivers through the assumption that the household head serves as the caregiver, this assumption is often inaccurate in practice and likely biased my findings. Further, I was unable to identify variables that identified long-term health shocks that were consistently available across all three waves of the survey, instead having to proxy this effect with the death of the main earner of the family. While such an event certainly generates considerable distortions for a family, it does not fully capture the distortionary effects of shocks like long-term illnesses on child schooling.

While the results of this analysis are limited by data constraints, my findings do suggest a role for potential policy interventions. I find that poor health, both for a child and, if

the child is female, her caregiver(s) in Ethiopia, is linked to less time spent in school. As discussed in Dupas (2011), individuals often undervalue preventative health technologies. Providing greater incentives and/or reducing the cost burden of taking up preventative health investments would be likely to reduce bouts of poor health in Ethiopia and, subsequently, increase schooling for the median child.

While I find no significant interaction effect, I do find that the presence as a spouse, here proxying the presence of a second caregiver, is associated with lower probability of absence in school for females. One potential way to counteract the negative effect of the absence of a spouse would be to implement a policy in which schools identify students coming from single-caregiver households and implement special programs for these children. These programs could provide additional incentives to attend school or function as an information campaign the promotes the importance of schooling in child development. It should be cautioned, however, that further studies with better child-caregiver linkages are needed before any well-informed policy decisions can be made.

References

[1] A. Case, C. Paxson & J. Ableidinger. "Orphans in Africa: Parental Death, Poverty, and School Enrollment." 2004. *Demography.* 483-508.

[2] P. Dupas. "Health Behavior in Developing Countries." 2011. *Annual Review of Economics.* Vol 3.

[3] Fomby, P. "Family Instability and College Enrollment and Completion." 2013. *Population Research and Policy Review.* 469-494.

[4] Glick et al. "Household Shocks and Education Investments in Madagascar." *Oxford Bulletin of Economics and Statistics.* 792-813, 2016.

[5] M. Mohanan. "Causal Effects of Health Shocks on Consumption and Debt: Quasi-Experimental Evidence from Bus Accident Injures." *The Review of Economics and Statistics.* 673-681, 2013.

[6] Zimmerman, F. "Cinderalla Goes to School: The Effects of Child Fostering on School Enrollment in South Africa." 2003. *The Journal of Human Resources.* 557-590.