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*Descriptive Finding*

### **Shocks and migration in Malawi**

**Philip Anglewicz**

**Tyler W. Myroniuk**

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## **Shocks and migration in Malawi**

**Philip Anglewicz**<sup>1</sup>

**Tyler W. Myroniuk**<sup>2</sup>

### **Abstract**

#### **BACKGROUND**

Research on the relationship between shocks and migration has primarily focused on large shocks, such as natural disasters or economic crises. Far less is known about smaller shocks, despite the fact that these shocks are common and often have a large impact on individuals and households, particularly in developing settings.

#### **OBJECTIVE**

We examine whether rural Malawians move after experiencing different types of small-scale shocks and examine if this relationship differs by gender and the number of shocks experienced.

#### **METHODS**

We use longitudinal panel data and measure shock exposure in 2008 and migration by 2010, which permits us to identify the order of events between migration and shock experience. We use multivariate logistic regression models to examine the relationship between shock experience and migration.

#### **RESULTS**

Those who experienced shocks in 2008 are significantly more likely to migrate. Men are more likely to move after environmental/economic shocks, while women are more likely to move after household shocks. While experiencing one shock does not lead to migration, those experiencing multiple shocks are more likely to migrate.

#### **CONCLUSIONS**

Small-scale shocks appear to force many rural Malawians to move residences. But the exact relationship between shocks and migration varies by gender and the number of shocks experienced.

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<sup>1</sup> Department of Global Community Health and Behavioral Science, School of Public Health and Tropical Medicine, Tulane University, New Orleans, USA. Email: [panglewi@tulane.edu](mailto:panglewi@tulane.edu).

<sup>2</sup> Department of Sociology and Anthropology, George Mason University, Fairfax, USA. Email: [tmyroniu@gmu.edu](mailto:tmyroniu@gmu.edu).

## **CONTRIBUTION**

Although seldom examined in research, our results demonstrate that small-scale shocks can lead to migration. These results suggest that, contrary to a common assumption that migrants are often better-off than their nonmigrant peers, migrants may be a vulnerable population in some settings and circumstances.

## **1. Introduction**

Residents of resource-deprived settings, like rural Malawi, are frequently exposed to various types of shocks. These shocks can be environmental, such as floods or droughts; economic, such as famines, and fluctuating prices for agricultural products; or filial, such as the death of household members (Gray and Bilsborrow 2013; Foresight 2011; IPCC 2014; United Nations 2015). The persistent, underlying threat of environmental, economic, or household shocks influence rural Malawians' livelihood strategies; individuals create a bastion of large and small sources of financial and nonfinancial support networks to access in times of crisis (Kohler et al. 2012; Myroniuk, Prell, and Kohler 2017).

Existing research on shocks and migration has typically examined large-scale shocks that affect a large population or geographic area, such as economic crisis (Curran, Meijer-Irons, and Garip 2016; Green and Winters 2010; Martin 2009) or natural disasters like Hurricane Katrina or the 2004 Indian Ocean tsunami (Fussell, Sastry, and VanLandingham 2010; Groen and Polivka 2010; Nobles, Frankenberg, and Thomas 2015). This research often focuses on differences in shock responses by socioeconomic status (e.g., Curran, Meijer-Irons, and Garip 2016; Green and Winters 2010; Martin 2009; Nobles, Frankenberg, and Thomas 2015). For instance, evidence from the Irish famine in the 1840s shows that those who had the financial means to emigrate to the United States and mainland Europe survived at remarkably higher rates than those who remained in Ireland (Ó Gráda and O'Rourke 1997).

Far less research has examined smaller-scale shocks and migration, despite the fact that these shocks are frequent and can have a large impact on individuals and households (Hyder, Behrman, and Kohler, 2015; some exceptions are Gray and Bilsborrow 2013; Gray and Mueller 2012). For example, migration could be a logical response for a subsistence farmer who lives in an area that is vulnerable to floods or droughts. Some limited research has shown that individuals may migrate due to divorce, widowhood, and HIV infection (Anglewicz 2012; Chirwa 1997; Mtika 2007; Reniers 2003). But the relationship between migration and other, frequent types of shocks has not been examined in this context. Similarly, the impact on migration may differ by the exact type of shock: It is unclear if economic

and filial shocks differentially push individuals to move. There could also be differences in shocks and migration by gender, since some research has shown that men and women in developing settings move for different reasons (Anglewicz 2012).

In this paper, we use longitudinal panel data from rural Malawi to examine whether individuals move after experiencing different types of small-scale shocks. We have four goals in this paper, which are to examine: (1) whether individuals experiencing various types of shocks are more likely to migrate; (2) if the relationship between shocks and migration differs for men and women; (3) whether there is a dose–effect relationship between the number of shocks and migration; and (4) among those experiencing shocks, what are the differences between individuals who migrate and those who remain?

## **2. Data and methods**

### **2.1 Data**

Data for this study comes from the Malawi Longitudinal Study of Families and Health (MLSFH), a longitudinal panel survey that has taken place in three regions of rural Malawi since 1998. In 1998, the MLSFH began collecting data for 1,532 women and 1,065 of their spouses from approximately 120 villages in three regions in Malawi: Balaka (southern region), Mchinji (central), and Rumphi (northern) (Kohler et al. 2015). The MLSFH study has followed these men and women over time, collecting data in 2001, 2004, 2006, 2008, and 2010. A detailed description of the MLSFH survey instrument, sample, and analysis of population characteristics can be found in Kohler et al. (2015).

We used data from the fifth (2008) and sixth (2010) waves of MLSFH, as this data captures essential features of our analysis. In 2008, the MLSFH measured shocks, phrased as, “Over the past five years, was your household severely affected by an unexpected crisis?” Using qualitative data, the MLSFH identified six shocks that are common among rural Malawians, including (1) poor crop yield, (2) changes in the price of grain, (3) damage to houses due to fire or flood, (4) death or serious illness of family members, (5) loss of sources of income, and (6) breakup of households. The MLSFH 2008 also collected details on each of the shocks experienced. Respondents were first asked if they had experienced each of the six shocks above in the previous five years (i.e., since 2003), what year the shock took place, and whether the shock caused any change in income or assets or both (more than 90% of respondents who report experiencing shocks claim that the shocks affected income, assets, or both).

In all waves of MLSFH data collection, the most common reason for noninterview is migration. The MLSFH keeps track of respondents who move by registering ‘migrants,’ or individuals who friends and/or family members report have permanently moved outside of the village. For our analysis in this research, we identify migrants as those who were interviewed in 2008 but were reported to have permanently moved to another location in 2010 MLSFH by friends and family members who remained in the MLSFH village.

## **2.2 Measures**

The longitudinal nature of our data is central to our analysis. To examine whether those who experienced shocks are more likely to move, we need to be sure that the shock definitively preceded the move. We establish the order of events in our analysis by utilizing the longitudinal MLSFH data.

Our shocks measures come from the 2008 MLSFH survey. We examine the six shocks listed above and create two summary measures of shocks: 1) environmental/economic (including poor crop yield, changes in the price of grain, and damage to houses due to fire or flood); and 2) family (death or serious illness of family members, loss of sources of income, and breakup of households). Although the MLSFH asks about shock experience for each of the past five years, we focus only on experiencing shocks in 2008. Previous research has shown no association between shocks prior to 2008 and migration by 2010, suggesting that if shocks indeed induce rural Malawians to move, those experiencing shocks in the more distant past may have already moved by the time of interview in 2008 (Anglewicz and Myroniuk 2017). Because MLSFH interviews took place between the beginning of May and end of July in 2008, our indicator for experiencing shocks in 2008 only covers half of the year. Consequently, this is a conservative measure of experiencing shocks. The MLSFH interview took place after the rainy season in Malawi, which lasts from November to April and is also when food shortages are most severe (Kohler et al. 2015).

To measure migration, we use data from the next wave of MLSFH in 2010. Overall, the MLSFH interviewed 2,372 men and women in 2008 with complete information on shocks, HIV status, and other relevant measures. Of these, 2,155 were interviewed again in 2010, and 217 moved by 2010.

### **2.3 Analytic methods**

We begin by tabulating the percentages of all respondents experiencing each type of shock (1) during the past five years since the time of the survey (from 2003 to 2008) and (2) in 2008. Next, we examine differences in shocks and migration by gender by comparing the percentage experiencing each type of shock for those moving and not moving separately for men and women.

We then perform several multivariate analyses to identify factors associated with shocks and migration. We examine whether those who experienced shocks are relatively more likely to migrate, controlling for other factors that may impact migration and shock exposure. To do so, we run logistic regressions where the dependent variable is migration by the 2010 wave of MLSFH, and independent variables are all measured prior to migration, from 2008, which ensures that the shocks occurred before the moves took place. In these regressions, we control for factors found to be associated with migration in Malawi (Anglewicz 2012; Anglewicz et al. 2017) and shocks (Fussell, Sastry, and VanLandingham 2010; Gray and Mueller 2012), including age, region of residence (northern, central, southern), level of education, marital status (married, divorced, widowed, never married), a household economic status index based on durable good ownership, and HIV-positive status. The key independent variables of interest in these regressions are experiencing economic and family shocks in 2008. We run these models separately for men and women to acknowledge differences by gender in shock-related behaviors (Hunter, Hatch, and Johnson 2004).

Next, we examine if there is a positive relationship between the number of shocks experienced in 2008 and the likelihood of migrating by 2010. These regressions include the same control measures as above, but the shocks measure is separated by those experiencing one shock in 2008 and two or more shocks, compared to those not experiencing shocks in 2008. Finally, we limit the sample to only men and women who experienced shocks of any kind in 2008 and compare the characteristics of those who migrated with those who did not.

## **3. Results**

Shocks are not uncommon in rural Malawi (Table 1). More than 90% of MLSFH respondents in 2008 experienced an environmental/economic shock in the previous five years (2003–2008). Of these shocks, poor crop yield was the most common (73.9%), followed by the change in price of grain (66.2%) and house damage (11.8%). Nearly two-thirds of respondents experienced household shocks, most commonly household death/illness (42.9%), followed by loss of income sources

(34.8%) and household breakups (8.6%). Although the percentages of those experiencing shocks are lower in 2008 than the previous five years (2003–2008), there are still non-negligible percentages of respondents experiencing shocks, at 20% experiencing environmental/economic shocks and approximately 10% with household shocks.

**Table 1: Shock experience among MLSFH men and women, 2008 MLSFH**

Survey measure	Measure abbreviation	% experiencing in past five years (2003–2008)	% experiencing in 2008
<b>Environmental/economic shocks</b>			
Poor crop yields, loss of crops due to disease or pests, loss of livestock due to theft or disease, or loss of coupon	Crop loss	73.9%	11.2%
Big change in price of grain	Grain price loss	66.2%	12.9%
Damage to house due to fire, flood, or other unexpected event	House damage	11.8%	1.5%
Experience any environmental/economic shock	Any environmental/economic	91.2%	20.0%
<b>Household shocks</b>			
Death or serious illness of an adult member or someone who provides support for yourself or your family	Household loss	42.9%	5.6%
Loss of source of income – such as loss of employment, business failure, someone who had been assisting the household stopped their support	Income loss	34.8%	3.4%
Breakup of household, such as a divorce	Household breakup	8.6%	1.0%
Experience any family/household shock	Any family	64.5%	9.6%

There are significant differences in the relationship between shocks and migration by gender. As shown in Table 2, different types of shocks influence migration for men and women. For women, those experiencing household shocks were more likely to migrate by 2010; men who experienced environmental/economic shocks in 2008 were more likely to move by 2010 than those who did not experience environmental/economic shocks.



**Table 2: Differences in migration and shock by gender, MLSFH men and women**

	Women		Men	
	Nonmigrant by 2010	Migrated by 2010	Nonmigrant by 2010	Migrated by 2010
Crop loss	11.5%	12.2%	9.0%	13.7%**
Grain price loss	13.7%	13.8%	10.5%	19.6%**
House damage	1.9%	1.6%	1.2%	0.6%
<b>Any environmental/ economic</b>	<b>20.6%</b>	<b>22.1%</b>	<b>16.8%</b>	<b>25.6%***</b>
Household loss	6.3%	8.8%	4.3%	6.0%
Income loss	3.7%	4.9%	3.2%	5.4%
Household breakup	1.0%	1.6%	0.5%	0.6%
<b>Any household</b>	<b>10.3%</b>	<b>14.5%**</b>	<b>7.7%</b>	<b>11.3%</b>
N	1,437		935	

Notes: \* $p \leq 0.10$ ; \*\* $p \leq 0.05$ ; \*\*\* $p \leq 0.01$ .

Those experiencing shocks are more likely to migrate, even after controlling for other factors associated with migration and shocks. As shown in Table 3, after controlling for age, education, number of living children, region of residence, household wealth, and HIV-positive status, those who experienced shocks were more likely to migrate by 2010. However, the relationship differs by gender and type of shock. There is less evidence that experiencing family shocks leads to migration: The association is statistically significant at a relatively low level ( $p < 0.10$ ) and only for women. However, the association between environmental/economic shocks and migration is stronger and more consistent: Among men, those experiencing an environmental/economic shock have 80% greater odds of migrating by 2010 than men who did not experience shocks. Women experiencing environmental/economic shocks are also more likely to move, but this relationship is statistically weaker (at  $p < 0.10$ ). Other factors associated with migration, such as region of residence, education, number of children, and HIV status, are consistent with previous research on this topic (Anglewicz 2012; Anglewicz et al. 2016).

**Table 3: Logistic regression results for the relationship between 2008 shocks and migration by 2010, MLSFH men and women**

	Family shock				Environmental/economic shock			
	Women		Men		Women		Men	
	Odds	SE	Odds	SE	Odds	SE	Odds	SE
Household shock	1.62*	0.43	1.02	0.40	---	---	---	---
Environmental/economic shock	---	---	---	---	1.49*	0.36	1.81**	0.50
Age	1.00	0.01	0.98	0.01	1.00	0.01	0.98	0.01
Region								
Central (ref.)	---	---	---	---	---	---	---	---
Southern	0.50***	0.12	0.97	0.26	0.48***	0.12	0.88	0.24
Northern	0.55**	0.13	0.41***	0.13	0.56**	0.14	0.42***	0.13
Level of education								
No education (ref.)	---	---	---	---	---	---	---	---
Primary level	1.97**	0.56	1.79	0.77	2.04**	0.58	1.76	0.76
Secondary level	2.52**	1.10	1.58	0.85	2.68**	1.17	1.57	0.85
Number of living children	0.86***	0.05	0.90*	0.06	0.86***	0.05	0.89*	0.06
Marital status								
Married (ref.)	---	---	---	---	---	---	---	---
Divorced	0.95	0.35	1.14	0.89	0.98	0.37	1.09	0.85
Widowed	1.65	0.56	1.50	1.63	1.69	0.57	1.40	1.54
Never married	3.03**	1.51	0.97	0.36	2.84**	1.41	0.96	0.36
Household wealth	0.99	0.05	0.95	0.07	0.99	0.05	0.95	0.07
HIV positive	3.45***	0.93	2.26*	1.08	3.47***	0.93	2.32*	1.11
N	1,437		935		1,437		935	

Notes: \*p ≤ 0.10; \*\*p ≤ 0.05; \*\*\*p ≤ 0.01.

We find a significant association between the number of shocks experienced in 2008 and migration by 2010 (Table 4). While there is no statistically significant relationship between experiencing one shock and migration by 2010 (compared to not experiencing shocks in 2008), we find that both men and women who experienced two shocks in 2008 were significantly more likely to move by 2010.

**Table 4: Logistic regression results for the relationship between total number of 2008 shocks and migration by 2010, MLSFH men and women**

	Women		Men	
	Odds	SE	Odds	SE
Number of shocks in 2008				
No shocks (ref.)	----	----	----	----
1 shock	1.42	0.35	1.14	0.34
2+ shocks	1.91**	0.62	2.37**	0.96
Age	1.00	0.01	0.98	0.01
Region				
Central (ref.)	----	----	----	----
Southern	0.46***	0.12	0.89	0.25
Northern	0.55**	0.13	0.41***	0.13
Level of education				
No education (ref.)	----	----	----	----
Primary level	1.98**	0.56	1.78	0.77
Secondary level	2.35*	1.04	1.62	0.87
Number of living children	0.86***	0.05	0.89*	0.06
Marital status				
Married (ref.)	----	----	----	----
Divorced	0.96	0.36	1.18	0.92
Widowed	1.67	0.57	1.42	1.55
Never married	3.17**	1.58	0.95	0.35
Household wealth	1.00	0.05	0.96	0.07
HIV positive	3.58***	0.97	2.23*	1.07
N		1,437		935

Notes: \* $p \leq 0.10$ ; \*\* $p \leq 0.05$ ; \*\*\* $p \leq 0.01$ ; we combine all individuals with more than two shocks into the 2+ category due to small numbers of individuals experiencing more than two shocks.

Finally, among men and women who experienced shocks (Table 5), we find that those who moved are different from those who did not in several characteristics – particularly among women. For women who experienced shocks, those living in the southern region are less likely to move – which likely reflects the matrilineal and matrilocal nature of Malawi's southern region (e.g., Schatz 2005). There is a negative relationship between the number of children and the odds for migration, and women with primary school education are more likely to move. Among men, there is only marginally significant relationship in which those with more wealth are less likely to move.

**Table 5: Regression results for the factors associated with migration by 2010 among those experiencing shocks in 2008, MLSFH men and women**

	Women		Men	
	Odds	SE	Odds	SE
Age	1.02	0.01	0.98	0.02
Region				
Central (ref.)	---	---	---	---
Southern	0.28***	0.12	1.55	0.77
Northern	0.95	0.42	0.30	0.29
Level of education				
No education (ref.)	---	---	---	---
Primary level	3.44**	1.91	3.97	3.45
Secondary level	1.55	1.38	4.68	5.47
Number of living children	0.76***	0.07	0.93	0.12
Marital status				
Married (ref.)	---	---	---	---
Divorced	1.73	1.02		
Widowed	2.34	1.39	11.33	17.84
Never married	2.72	3.60	1.02	0.71
Household wealth	1.09	0.11	0.75*	0.13
HIV positive	2.15	1.27	0.67	0.76
N		386		202

\*p ≤ 0.10; \*\*p ≤ 0.05; \*\*\*p ≤ 0.01.

## 4. Discussion

Environmental/economic and family shocks are common in rural Malawi and often lead to migration. Even after controlling for other factors that influence migration and shocks, we still find that those experiencing shocks are more likely to move by 2010. However, this pattern is not consistent by gender: Women’s migration appears to be more strongly linked to family shocks, whereas men who experience environmental/economic shocks are more likely to migrate. We also find that the number of shocks matters: While households may be able to withstand one shock, those experiencing two or more are significantly more likely to move.

Although this research more clearly establishes the order of events between shocks and migration, we do not aim to establish that shocks cause migration. There

are likely other factors related to both migration and shocks that we do not control for in our models. Also, rural Malawian households may have predetermined responses to shocks, although they cannot know the exact shock that will occur or when it will happen, and their vulnerability varies across the year. Further, we cannot externally validate self-reporting of our shocks since they are smaller in scale. Another challenge in this research is the categorization of shocks. For example, we cannot distinguish between environmental and economic shocks since some types of shocks, like famine, may be environmental only, economic only, or a mix of both.

Overall, these findings depict an image of migrants that is different than often found in the literature. Research often portrays migrants as better-off: The ‘healthy migrant hypothesis,’ for example, suggests that migrants are healthier than their peers at both origin and destination (Jasso et al. 2004; Landale, Oropesa, and Gorman 2000; Lu 2008; Palloni and Morenoff 2001), due in part to considerations of challenges involved in moving (Palloni and Morenoff 2001). In contrast, we find that migrants may be a vulnerable group, one that is more likely to experience shocks than those who do not move. This vulnerability may apply more to men than women: Among those experiencing shocks, men with greater household wealth are less likely to move, but women with more education and fewer children are more likely to move.

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