Children's Nutritional Outcomes and Family Resource Transfers in Rural Malawi

Monica J. Grant, *University of Wisconsin at Madison*

Hans-Peter Kohler, *University of Pennsylvania*

Abstract

This paper uses data from the Malawi Longitudinal Survey of Families and Households (MLSFH) to examine the association between children's nutritional status and resource transfers to and from their households. Anthropometric data on co-resident children aged 0-5 were collected for the first time in the 2008 MLSFH. These height (cm) and weight (kg) measurements were converted into z-scores relative to the sex- and age-specific WHO 2006 international child growth standards. Preliminary analyses show an inverse relationship between the number of family and friends from whom a respondent receives non-financial assistance and the prevalence of stunting and underweight among co-resident children. In contrast, children who are co-resident with respondents who received no large financial transfers had worse nutritional outcomes relative to those who received any large transfers. Future analyses will use multilevel regression models to examine which components of extended family networks are most important for these child nutritional outcomes.

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Children's growth and nutritional outcomes have significant associations with both child survival and later life outcomes. Many studies have found an association between stunting and underweight status and the subsequent mortality risk for children younger than five years old (Muller et al. 2003; Pelletier 1994; Schroeder and Brown 1994; Van den Broek et al. 1993). Not only do childhood nutritional deficiencies have a direct impact on mortality risk, but they also increase susceptibility to infectious disease (Ezzati et al. 2002; Rice et al. 2000). The combined effects of childhood malnutrition and infectious disease exert a lifelong impact on life expectancy, cognitive development, and labor market outcomes (Case and Paxson 2008; Deaton 2007; Elo and Preston 1992; Fogel 2004). Although family-level characteristics are known to have a strong association with children's nutritional status (Sear and Mace 2008; Desai and Alva 1999; Griffiths et al. 2002; Mode et al 1994), unobserved family-level traits contribute a large proportion of the unexplained residual variance in the prevalence of nutritional deficiencies; several of these cross-national studies have found the largest family-level intraclass correlation in children's nutritional outcomes in Malawi relative to other less developed countries (Griffiths et al. 2004; Madise et al 1999). We hypothesize that the extended family's contribution to child well-being may be an important component of unobserved family-level influences.

Why would the extended family influence children's nutritional outcomes? Theories from evolutionary biology focus on the importance of transmitting one's genetic material to the next generation. Under these assumptions, altruistic exchanges between family members should be more likely when they share a higher degree of genetic relatedness (Hamilton 1967). Intergenerational investment in child survival has even been proposed as a selection mechanism for human longevity (Hawkes et al. 1998; Hill and Hurtado 1994; Kumvan and Kaplan 2006). Evidence from a range of settings suggests that grandmothers contribute to child survival and nutritional status, in particular through their contribution to child nutritional practices (Aubel et al 2004; Bezner Kerr et al. 2008; Gibson and Mace 2005; Noel-Miller 2005). The survival or proximity of a maternal grandmother relative to a paternal grandmother is more often associated with positive child outcomes, even in patrilineal societies (Hadley 2004; Sear and Mace 2008), perhaps attributable to a greater certainty of genetic relatedness.

However, the degree of relatedness between household or family members does not reliably predict child outcomes. Few studies of younger children have found significant differences in the nutritional statuses of foster or orphaned children relative to children who lived with a biological parent (Mishra et al. 2007; Parikh et al. 2007; Sarker et al. 2005; see Beegle et al. 2009 for evidence of a negative association between maternal orphanhood and adult outcomes). In Mali, Castle (1995) found that while fostering itself did not impact children's weight-for-age z-scores, the reason that a child was fostered was significantly associated with the initial score. Other studies from West Africa found a weak association between sibsize and height-for-age z-scores, which was interpreted as evidence that the costs of childrearing were distributed across the extended family (Desai 1992). In contexts like Malawi, where child fostering is also extremely common (Grant and Yeatman 2008), it is not unreasonable to believe that the extended family may influence children's outcomes.

In addition to overlooking the contribution of the extended family to children's nutritional and survival outcomes, the demographic literature has also overlooked the role that kinship systems play in these processes. Although ethnicity has been used in studies of child health to explain feeding and childcare practices (e.g., Das Gupta 1990; Bezner Kerr et al. 2008), it was not included in any of the multilevel models cited above. Beyond childcare practices, ethnicity correlates with inheritance and descent systems that govern access to social and economic resources and regulate exchange obligations. One of the only studies to control for the gendered dimensions of land ownership and inheritance found, in a matrilineal community in Malawi, that the presence of more adult female relatives actually increased the likelihood of child mortality (Sears 2008). This finding suggests that kinship groups might not always work together to invest in children's well-being when kin are competing for resource ownership. By providing a more nuanced understanding of the content and structure of available resource networks, this project will contribute to our understanding of how these exchange relationships affect child health.

Data and Methods

This paper will use data from the 2008 Malawi Longitudinal Survey of Families and Households (MLSFH) to examine the association between children's nutritional status and resource transfers to and from their households. The MLSFH is an extension of the Malawi Diffusion and Ideational Change Project, a longitudinal survey that has followed 1,500 women and their spouses since 1998. Over time, new spouses have been added to the sample, but respondents who have migrated out of the study area have not been followed. A new cohort of 15-24 year old respondents was added in 2004, in order to replenish the sample. The 2008

survey round successfully interviewed 3,910 respondents. The sample is based in three districts of Malawi—Balaka, Mchinji, and Rumphi—that were chosen to represent the southern, central and northern regions of the country. Each has a distinct ethnic composition: most residents of Mchinji are Chewa, an ethnic group that has traditionally been matrilineal but that has begun to adopt patrilineal practices over the past century; the population of Rumphi is predominantly Tumbuka, a patrilineal group; and many residents of Balaka are Yao, a matrilineal ethnic group.

Anthropometric data on co-resident children aged 0-5 were collected for the first time in the 2008 MLSFH. These height (cm) and weight (kg) measurements were converted into z-scores relative to the sex- and age-specific WHO 2006 international child growth standards (WHO Multicentre Growth Reference Study Group 2006; de Onis et al. 2007). The measurement of height is adjusted for whether the child was measured standing or recumbent. Children are classified as being "stunted" if their height for age z-score is more than two standard deviations below the international mean. Children are classified as "underweight" if their weight for age z-score is more than two standard deviations below the international mean. Children are classified as "wasted" if their weight for height z-score is more than two standard deviations below the international mean. Table 1 compares these anthropometric measurements from the 2008 MLSFH to the 2006 Malawi Multiple Indicator Cluster Survey (MICS), a nationally representative survey of child well-being conducted by UNICEF. We find that the 2008 MLSFH reasonably approximates the distribution of anthropometric characteristics observed in the MICS survey, suggesting that the children identified by the MLSFH are reasonably representative of similarly aged children in each district. The key exception is the higher prevalence of stunting in Rumphi, relative to the same district in MICS.

In addition to anthropometric data, the 2008 MLSFH is distinguished by its detailed collection of resource transfers to and from a respondent, both from their parents and children, but also from other, non-related or more distantly related, individuals from whom they can also seek support. These data allow us to examine whether children living in households with a larger network of potential transfer partners have better nutritional outcomes that children in households with fewer transfers.

Our analysis will use multi-level logit regressions to examine whether a child is stunted or underweight, as well as multi-level linear regressions to examine a child's height-for-age and weight-for-age z-scores. Multi-level models are necessary, since there are often multiple children younger than age 5 living in the same household. This approach will allow us to parse out the contribution of child-level and household-level characteristics to the variance in outcomes.

Preliminary Findings

Table 2 shows the distribution of children's nutritional outcomes by selected background characteristics. These preliminary descriptive analyses show several striking patterns. The prevelance of stunted growth is lower among girls and the biological children of respondents, while there were clear non-linearities in the prevalence of stunting by the child's age and by the number of children in the household. Similar patterns are also found in the prevalence of underweight. There is also an inverse association between both the prevalence of stunting and underweight and the number of people from whom the survey respondent receives non-financial support. In contrast, stunting and underweight appear to be more common among children living in households where the respondent received no financial transfers, relative to those who received one or more. The association between nutritional outcomes and financial and non-financial transfers from the respondent to other individuals mirrors the patterns just discussed for transfers to the household. These patterns suggest that individuals who have a larger network of family and friends from whom they can share non-financial assistance, such as help with childcare or food provision, are able to translate these networks into improved child outcomes. In contrast, individuals who are unable to receive financial assistance from any network partners have worse nutritional outcomes for co-resident young children.

Table 1. Distribution of anthropometric characteristics, children aged 0-59 months, by region, Malawi

	MLSFH, 2008			MICS, 2006			
Anthropometric characteristic	Balaka	Mchinji	Rumphi	Balaka	Mchinji	Rumphi	All Malawi
Stunted, %	46.0	58.1	50.5	40.5	56.9	35.0	45.9
Underweight, %	11.9	17.3	12.4	14.5	20.6	14.0	19.4
Wasted, %	3.5	3.3	3.4	2.3	2.9	1.9	3.3

Table 2. Distribution of nutritional outcomes by child and household characteristics, 2008 Malawi Longitudinal Survey of Families and Households

	Stunting	Underweight	Height for age z score	Weight for age z-score
Non-financial transfers to household				
0-1	53.5	15.0	-1.99	-0.68
2	48.4	12.0	-1.67	-0.4
3-4	44.2	7.9	-1.89	-0.31
Financial transfers to household				
0	56.7	20.4	-2.08	-0.86
1-3	51.9	13.0	-1.96	-0.59
4+	51.4	14.4	-1.86	-0.59
Non-financial transfers from household				
0-1	53.1	15.5	-1.95	-0.72
2	51.8	12.3	-2.07	-0.28
3-4	50	9.7	-1.82	-0.47
Financial transfers from household				
0	55.5	17.6	-1.99	-0.79
1-3	54.2	14.9	-2.07	-0.75
4+	48.9	14.4	-1.78	-0.39
Sex of child				
Male	54.8	14.5	-2.04	-0.56
Female	50.5	14.2	-1.88	-0.7
Biological child of respondent				
No	56.5	18.4	-2.12	-0.82
Yes	51.3	13.1	-1.9	-0.57
Region				
Mchinji	58.1	17.3	-2.09	-0.84
Balaka	46	11.9	-1.69	-0.48
Rumphi	50.5	12.4	-2.02	-0.45
Age (in months)				
0-11	36.6	13.9	-0.9	0.02
12-23	50.3	14.5	-1.84	-0.74
24-35	61.2	13.8	-2.43	-0.78
36-47	59.5	13.5	-2.33	-0.75
48-60	52.6	16.6	-2.16	-0.85
Number of children in household				
0	56.3	18.1	-2.1	-0.83
1-2	51.7	13.7	-1.94	-0.6
3+	53.6	14.7	-1.93	-0.63