Intergenerational Transfers in the Era of HIV/AIDS: Evidence from Rural Malawi

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Abstract

Intergenerational transfers and relations in sub-Saharan Africa are only poorly understood, despite the alleged importance of family networks and family resource transfers to ameliorate the implications of the HIV/AIDS epidemic and the effect of the epidemic on the availability of kin and the structure of multi-generational families. Our analyses fill an important niche in the literature by using innovative longitudinal data from rural Malawi that includes extensive information on intergenerational transfer relations across three generations living in a context characterized by high poverty, a generalized HIV/AIDS epidemic and high levels of morbidity and mortality. We estimate the age patterns of transfers and the multiple directions of transfer flows—from prime-aged respondents to their elderly parents as well as their co-residing and non-coresiding adult children age 15+. Our major findings include that: (1) Financial net transfers are strongly age-patterned and the middle generations are net providers of transfers to their adult children and elderly parents; (2) Non-financial transfers are based on mutual assistance rather than reallocation of resources to worse-off family members; and (3), Provision and receipt of transfers are generally not related to the health status of our adult respondents, including HIV+ status and perception of HIV infection despite widespread perceptions that HIV+ status is primary determinant of such transfers.

Introduction

Individuals in sub-Saharan Africa (SSA) are frequently exposed to multiple social, economic and environmental burdens, including poverty levels that are among the highest in the world, volatile incomes, and a living environment characterized by high disease prevalence and high mortality. In addition, individuals and families in these contexts have virtually no or only very limited access to formal insurance and social protection systems that can buffer the consequences of frequent economic and health shocks, or that can provide support for frail and less productive individuals. In the absence of formal insurance and institutionalized transfer systems, informal redistribution of resources and reciprocity—often occurring among nuclear family members and extended kin—are the primary mechanisms providing insurance against risks and support in periods of needs.[1] In this context, the family is a central institution through which shocks are mitigated, investments in human and social capital are secured, and support for dependent children and

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elderly is provided.[2] From an intergenerational perspective, nuclear families and kin members act as key providers of income and support through the redistribution of resources from productive prime-aged adults to dependent relatives at younger and older ages. These intergenerational transfer behaviors and transfer flows are constrained by demographic processes such as fertility, mortality and migration patterns that shape the age-structure of the population and the composition of multigenerational families more specifically, and thus determine the availability of kin resources. In addition, intergenerational transfer patterns are shaped by the underlying social, economic, cultural, normative and political context in which these transfers occur.[3]

In the context of the HIV/AIDS epidemic in SSA, a focus on transfer relations and behavior is of particular relevance for several important reasons. By affecting fertility, morbidity and mortality patterns in the region, the HIV/AIDS epidemic has changed the demographic determinants of transfer behavior, resulting in substantial disruptions in social network structure, intergenerational composition of families and availability of kin. Support provided through social networks, however, may partially alleviate the consequences of the epidemic for those who are directly or indirectly affected by the increased morbidity and mortality resulting from HIV/AIDS. Intergenerational transfers are an important, and perhaps even the most essential component of the existing support networks in SSA. Despite this heightened relevance, however, the intergenerational transfer patterns occurring within families in SSA are currently only poorly understood and documented.[4] There is hence a considerably need for research on intergenerational support networks and transfers to better understand the mechanisms through which extended families cope with the epidemic and potentially alleviate some of its consequences, and to help to design and implement improved policies that target the most vulnerable members of populations affected by the AIDS epidemic.

Our analyses make an important contribution to the emerging literature on intergenerational relations in SSA in the context of HIV by drawing on innovative and rich new data collection from rural Malawi that includes extensive information on intergenerational transfer relations across three generations living in a context characterized by high poverty, and high morbidity and mortality. Specifically, we describe the age patterns of transfers and the multiple directions in which financial and non-financial transfers flow—from prime-aged respondents to their elderly parents and vice versa, and also between respondents and their *co-resident* and *non-coresident* adult children above age 15. In addition, we investigate to which extent these transfer flows are related to the health status and other socioeconomic characteristics of the transfer providers and transfer recipients. Moreover, we approximate the extent to which these transfers result in an intergenerational redistribution of resources, as compared to mutual assistance across generations that results in balanced resource flows in both directions.

Several new findings emerge from our analyses: ***First***, intergenerational financial and non-financial transfers are widespread and a key characteristic of family relationships in rural Malawi. ***Second***, downward and upward transfers are importantly constrained and determined by the availability of transfer partners (parents or adult children): conditional on parents being alive, financial transfers from prime-aged individuals to their parents are widespread and do not follow a strong age pattern, despite the fact that there is a marked decline of parental health among older prime-aged respondents. From a life-cycle perspective for the overall sample, however, the transfers from respondents to parents are strongly age-patterned with a decline in their frequency with age as the probability of having alive parents diminishes with respondent's age. Our data show that downward transfers from parents to their children (i.e., the respondents in our study) are less common than upward transfers, and if they occur, they are concentrated at early adult ages (20-30

years) rather than the later adult ages (30-35 years) when AIDS-related morbidity is more likely to occur. ***Third***, while a large fraction of males and females at ages 40-60 provided to and received transfers from their adult living children—with the provision of transfers to children dominating at early adult ages and the receipt of transfers from children rising at later adult ages—only a relatively small number of children seems to be engaged in these transfers. ***Fourth***, our analyses of net transfer flows between respondents and their parents/children indicate that *non-financial* assistance is relatively unimportant in terms of resource reallocation between generations, despite the fact that there is extensive—and also sometimes age-patterned—mutual non-financial help across the generations. *Net financial transfers* to both children and parents are in contrast strongly age-patterned and peak in mid-to-late adult ages: both male and female respondents age 40–45 in our data provide substantial upward transfers to their parents (possibly more extensive for female than for male respondents), and at the same time, they make substantial downward transfers to their adult living children (possibly more extensive for male than for female respondents). ***Fifth***, multivariate analyses of transfers between respondents and their elderly parents suggest that, quite surprisingly in light of the existing literature, transfers *do not strongly vary* by the respondent's or the parents' health status including HIV+ status and perception of HIV risk. These transfers, however, do vary with respondent's wealth and sometimes by education, they differ across regions, and they are positively associated with the transfers (giving and receiving) to and from children. ***Sixth***, transfers between respondents and their children are strongly determined by the sex composition and age of children, and they are positively associated with the transfer patterns between respondents and their parents. Similarly to the transfer patterns between respondents and their parents, the transfers from respondents to children—including both financial and non-financial transfers—do not vary significantly by the health status of the respondent or that of their adult living children.

The remainder of our analysis is organized as following. In the next section, we discuss the potential impact of the HIV/AIDS epidemic in SSA on transfer relationships between generations, followed by a presentation of the Malawi Longitudinal Study of Families and Health (MLSFH) and the unique collection of information on transfer behaviors and family relationships in rural Malawi. We then describe the family structure in rural Malawi in relation to health and survival of generations and estimate the age patterns of financial and non-financial transfers in rural Malawi from the perspective of three generations—the MLSFH respondents, their parents and their adult children 15 years old and older. Special emphasis in this analysis is given to the estimation of net transfer flows between generations. Subsequently we discuss the correlates of transfer patterns to/with parents and adult children, where a special focus is given to how health predicts given and received financial and non-financial transfers, and in the final section, we discuss our results in the context of existing theories on intergenerational transfers.

HIV/AIDS, Health Status and Intergenerational Transfers

Since its outbreak in the late 1980s the HIV/AIDS epidemic has transformed the demographic, health, social and economic environment in SSA.[5] The impact of the HIV/AIDS epidemic is not only direct, but the levels and specifically the characteristic age pattern of the disease have indirect implications for household structure and household organization, residential patterns, kin relationships, and overall well-being of family members, including those family and kind members who themselves are not infected with the virus. The high levels of HIV/AIDS morbidity and mor-

tality in SSA have been hypothesized in the literature to have disruptive, profound and immediate impacts on multiple aspects of individuals' and their extended families' lives.[6] HIV/AIDS is also expected to add significantly to the burden of aging in SSA as well as in other developing regions.[7] For instance, while the median age of the Malawi population is still below 17, Malawi—similarly to other SSA countries—will age rapidly in the next decades in ways that are significantly different from the aging patterns in other developing countries due to the consequences of the AIDS epidemic[8].

Since a substantial proportion of the elderly in SSA are supported by intra- and intergenerational family networks, AIDS-related morbidity and mortality that peaks at primary adult ages affect the ability of families to care for their elderly members and increases the pressure on existing support networks[9]. In addition, the elderly are often indirectly affected as the HIV/AIDS epidemic increases the importance of older individuals in sustaining the family through financial and non-financial contributions, or taking upon care-giver responsibilities for sick adult children and a rising number of orphaned grandchildren. Therefore, the implications of the AIDS epidemic potentially include changes in the patterns of financial and non-financial support between kin members. Through these responses in transfer patterns, extended families may potentially alleviate the effects of economic and health shocks on individuals. With few exceptions[10], however, the age patterns and directions of financial and non-financial transfers, and their relationship to health gradients between generations, have not been described in the SSA context and our knowledge about the flows and distribution of transfers between generations is very limited. The limited availability of data on transfer behaviors between family members is a key reason for this lack of detailed studies. In addition, the few studies that have investigated intergenerational relations in a SSA context have focused on how these transfers are determined by the health of the elderly generation, without much attention to the health of prime-aged adults who are the primary providers of such transfers. These studies thus implicitly rely on the assumption that for the most part in most developing societies the health of prime-aged adults is relatively good in comparison with that of young children and the older population. This pattern, however, may have changed importantly as a result of the HIV/AIDS epidemic.

The present study provides a new perspective on intergenerational transfers and relations in SSA by describing age-patterns of transfers and resource allocation, and by investigating whether transfers from adults in productive working ages to both their children 15+ years old and their elderly parents depend on the health status of the adults in the middle generation. For example, when in poor health, working-age adults may be less able to provide financial and non-financial support to their parents or children, or their motivation to provide transfers to dependent relatives may change. Because children and the elderly are reliant on transfers from working-age adults, it is similarly likely that the health of the elderly and children is affected by poor health or decreased productivity of working-age adults. In addition, the HIV/AIDS epidemic has increased both health and economic uncertainty from the individual as well as the family perspective, but no evidence exists on how this will affect transfer behavior among family members. Besides objective health status, transfers from and to working-age adults may also be affected by the perceived health and health risks of these adults. For example, empirical evidence from Malawi, suggests that in the presence of the HIV/AIDS epidemic, prime-aged adults perceive their own mortality risks not only to be high, but higher than might be expected based on measured mortality rates[11]. Arguably, such pessimistic subjective survival expectations may importantly affect intergenerational transfer patterns because they diminish respondent's perceptions of future life expectancies, earnings and consumption.[12] Moreover, while most of this prior research on transfers has focused

on dyads and specifically the exchanges between an older parent and one randomly selected adult child[13], our analysis takes a multi-generational perspective by describing intergenerational transfer patterns that involve individuals aged 20–60 years (i.e., the primary respondents in our data), their elderly parents *and* their adult children aged 15 and above. An additional innovation of our study is that we include both co-resident and non-coresident parents and children.[14] This aspect of our analysis is of particular importance because adult children who co-reside with their parents may have different motivations and obligations for the provision of transfers compared to their non-coresiding siblings, and the decision to co-reside is likely to depend on the parental preferences as well as their health status[15].

Data and Descriptive Statistics

Data used in this analysis are from the Malawi Longitudinal Study of Families and Health (MLSFH; formerly, Malawi Diffusion and Ideational Change Project, MDICP), a longitudinal panel survey with survey waves in 1998, 2001, 2004, 2006, 2008 and 2010 that is currently focused on studying the mechanisms that individuals, families, households, and communities develop and use in a poor rural setting to cope with the impacts of high morbidity and mortality in their immediate living environment. The MLSFH is implemented in three sites in rural Malawi: Rumphi (in the northern region), Mchinji (in the central region), and Balaka (in the southern region).[16] The project started in 1998 with a sample of 1,541 ever-married women aged 15–49 and 1,065 of their spouses. In 2001, respondents were re-interviewed, along with any new spouses since 1998. In 2004, the study added two new components to the data-collection: a new additional sample of approximately 1,500 adolescents, and free HIV testing and a voluntary counseling on the HIV test results for all respondents. The MLSFH returned for a fourth wave of survey data collection and a second round of HIV testing in 2006, and it followed-up in 2008 and 2010 with two additional rounds of wide-ranging survey data, including the collection of the extensive transfer data used in this analysis, accompanied by a third round of HIV testing and counseling.

Table 1 summarizes demographic and socioeconomic characteristics for the MLSFH respondents included in our analysis. The sample is comprised of 1,837 female respondents and 1,305 male respondents 20 to 60 years old in 2008. The mean age of female respondents is 36.5 years, while male respondents are on average one year older. Men are on average better educated than women. For instance, only 13% of male respondents have no formal schooling, while twice as many women fall into this category. 21% of men have secondary or higher level of schooling, but only 8% of women have completed this level of schooling. In response to questions about their subjective probability of being infected with HIV, the majority of men (55%) and about half of the women (48%) responded that there is some likelihood to be infected. About one third of both sexes rates this likelihood as low, and only 5% of men and 9% of women rated the likelihood of being HIV positive as high.[17] The largest fraction of respondents rated their health status as good, very good or excellent, and only 6% of women and 2% of men rated their health status as poor or very poor. Based on HIV test results, 8% of female respondents and 4% of male respondents were HIV positive.[18]

A key innovation of the 2008 data collection enabling the present analyses has been the expansion of the family and transfer information. The 2008 household and family roster includes not only all individuals who currently live in the household as frequently done in other studies, but it also asked information about all parents and children independent of their survival and

Table 1: Descriptive statistics for respondents aged 20–60 (in 2008)

	Females	**Males**	**Total**
N	1,837	1,305	3,142
Mean age in years (SD)	36. 5 (11.4)	37.7 (12.0)	37.0 (11.6)
Schooling (proportion)			
No schooling	0.29	0.13	0.22
Primary schooling	0.63	0.66	0.64
Secondary or more schooling	0.08	0.21	0.14
Subj. prob. of being HIV infected (proportion)			
No likelihood	0.45	0.52	0.48
Low likelihood	0.32	0.31	0.32
Medium likelihood	0.14	0.12	0.13
High likelihood	0.09	0.05	0.07
Subjective Health (proportion)			
Excellent	0.11	0.23	0.16
Very good	0.48	0.50	0.49
Good	0.35	0.25	0.31
Poor	0.05	0.02	0.04
Very poor	0.01	0.00	0.01
Some subj. likelihood of being HIV (proportion) infected	0.55	0.48	0.52
HIV+	0.08	0.04	0.06

resident status, including their demographic, socioeconomic characteristics and transfers received and given from the respondent's perspective. In addition, approximately 800 parents of MLSFH respondents were interviewed. The present analysis is based on the 2008 MLSFH data since they provide the most comprehensive and detailed information on transfers and intergenerational relations within the MLSFH.[19] In total, 3,850 fathers (1,570 of whom were alive), 3,830 mothers (2,150 of whom were alive), and 22,000 children (16,050 of whom are alive) were listed in the approximately 3,900 household/family rosters that were collected in 2008.

Specifically, for each listed parent or child, MLSFH respondents were asked a set of questions, including: "***What is [name's] relationship to you?***", with our analyses focusing on the respondent's parents and children. "***Is [name] alive?***"For all living parents/children, respondents were asked: (*i*) "***How old is [name]?***", with children above age 15 considered as "adults" in our analyses; (*ii*) "***Where does [name] usually live?***", where we classify parents/children living in the same household or compound as the respondent as *co-resident*; (*iii*) "***How would you rate [name's] health in general?***", with response categories including excellent, very good, good, poor, very poor. Because few respondents used poor or very poor to describe the health of their children or parents, similar to the response pattern for the respondents themselves (see Table 1), these categories were further collapsed in our analyses into *excellent health*, *good health*, and *very poor, poor or good health*; and (*iv*) "***What is the highest level of schooling [name] has attended?***", from which we establish whether respondents have completed less than primary schooling, primary schooling, or secondary schooling or more.

Since the quantitative measurement of transfers in contexts such as Malawi is inherently difficult, the MLSFH did not attempt to monetize the financial and non-financial transfers between respondents and their children or parents. Instead, for all alive parents and children above age 15, MLSFH respondents were asked a set of questions about financial and non-financial assistance, including: (*i*) "***In the past two years, have you given [name] any money or financial assistance?***", with responses ranging from: 0 = no; 1 = yes, a little; 2 = yes, some; and 3 = yes, a lot; (*ii*) "***In the past two years, have you given [name] any non-financial help? This could include help that takes time like collecting firewood, cooking, taking care of people, or helping with farming.***", with responses ranging from 0 = no; 1 = yes, once; 2 = yes, several times a year; 3 = yes, at least once a month; 4 = yes, at least once a week; and 5 = Yes, daily; (*iii*) "***In the past two years, has [name] given you any money or financial assistance?***", with responses ranging from: 0 = no; 1 = yes, a little; 2 = yes, some; and 3 = yes, a lot; and (*iv*) "***In the past two years, has [name] given you any non-financial help? This could include help that takes time like collecting firewood, cooking, taking care of people, or helping with farming.***", with responses ranging from 0 = no; 1 = yes, once; 2 = yes, several times per year; 3 = yes, at least once a month; and 4 = yes, at least once per week.

For each of the above questions about financial/non-financial transfers among respondents and their parents or children 15 years old and older, a further binary variable was created that indicates whether a respondent has given or has received a ***substantial amount*** of transfers, defined as either "2 = yes, some and 3 = yes, a lot" for financial transfers and "3 = yes, at least once a month; and 4 = yes, at least once per week" for non-financial transfers.

Table 2 presents descriptive statistics for the respondent's parents and given and received transfer patterns between respondents and their parents. More than 60% of female and male respondents have alive mothers, but only 46% of respondents have alive fathers. The mean age of mothers is about 60 years, while fathers are about 4 years older. Mothers are on average about 25–26 and fathers are about 32 years older than the respondents. About 13–15% of alive mothers, and 15–17% of alive fathers are assessed by the respondents as being in excellent health, and 57% of

Table 2: Descriptive statistics for transfer patterns between respondents aged 20–60 and their parents.

	Females		Males		Total	
	Mother	Father	Mother	Father	Mother	Father
Parent survival and health						
Parent is alive	0.64	0.46	0.63	0.45	0.63	0.45
Mean age (if alive)	59.5	63.4	59.0	63.9	59.3	63.6
(if mother/father is alive)	(13.1)	(12.6)	(13.8)	(12.3)	(13.4)	(12.5)
Age difference to respondent	26.1	31.8	24.9	31.8	25.6	31.8
(if mother/father is alive)	(9.7)	(10.2)	(10.3)	(10.1)	(10.0)	(10.1)
Parent (if alive) is in						
excellent health	0.13	0.15	0.15	0.17	0.14	0.16
very poor/poor/good health	0.57	0.52	0.57	0.51	0.57	0.52
Transfers to/from alive parents						
R has given money or financial assistance						
no	0.24	0.43	0.14	0.22	0.20	0.34
yes, a little	0.36	0.29	0.27	0.28	0.32	0.29
yes, some	0.28	0.20	0.35	0.32	0.31	0.25
yes, a lot	0.12	0.07	0.24	0.18	0.17	0.12
R has given non-financial help						
No	0.12	0.30	0.13	0.22	0.13	0.26
Yes, once	0.08	0.07	0.10	0.09	0.09	0.08
Yes, several times per year	0.50	0.42	0.55	0.51	0.52	0.45
Yes, at least once per month	0.14	0.13	0.10	0.10	0.12	0.12
Yes, at least once per week	0.15	0.08	0.12	0.09	0.14	0.08
R has received money or financial assistance						
no	0.51	0.51	0.56	0.50	0.53	0.51
yes, a little	0.27	0.22	0.25	0.19	0.26	0.21
yes, some	0.16	0.17	0.11	0.15	0.14	0.16
yes, a lot	0.07	0.10	0.08	0.15	0.08	0.12
R has received non-financial help						
No	0.35	0.57	0.32	0.47	0.34	0.53
Yes, once	0.10	0.09	0.09	0.08	0.09	0.08
Yes, several times per year	0.37	0.25	0.41	0.32	0.39	0.28
Yes, at least once per month	0.11	0.07	0.09	0.07	0.10	0.07
Yes, at least once per week	0.07	0.03	0.09	0.06	0.07	0.04
Summary measures of transfers						
R has given substantial amount of financial help	0.40	0.27	0.59	0.50	0.48	0.37
R has given substantial amount of non-financial help	0.29	0.21	0.22	0.19	0.26	0.20
R has received substantial amount of financial help	0.23	0.28	0.20	0.30	0.21	0.29
R has received substantial amount of non-financial help	0.18	0.09	0.17	0.12	0.18	0.11

mothers and 51–52% of fathers are described as being in very poor, poor or good health. Transfer patterns also vary by sex of the parents. Both male and female respondents are more likely to give help to their mothers than to their fathers. For instance, 43% of female respondents and 22% of male respondents stated that they have not given any financial help to their fathers, as compared to 22% and 14% respectively to their mothers. 12% of female respondents and twice as many male respondents give a lot of financial support to their mothers, but only 7% of daughters and 18% of sons gave a lot of financial help to their fathers. Interestingly, about equal fractions of men and women give at least once a week or once per month a lot of non-financial help to their parents.

While most respondents gave some assistance to their parents, half of the respondents have not received any financial assistance from their parents. The summary measures of transfers shown in the bottom of table 2 suggest that fathers are more likely to support their prime-aged adult children financially than mothers, and slightly more male respondents (30% versus 28% for women) receive some or a lot of financial help from their fathers. In contrast, mothers are more likely to provide non-financial support than fathers and daughters benefit somewhat more than sons.

Descriptive statistics for transfers between respondents 30–60 years old and their children are shown in Table 3.[20] Female respondents in our sample have on average 6.7 ever-born children, and male respondents have 7.1 ever-born children. The number of living children is lower, about 5 children for women and 6 children for men. Female and male respondents have on average 2.5 adult living children above age 15. The number of adult children among respondents with at least one alive child 15+ years old is higher, and respondents have on average more than 3 adult children with a mean age of about 22 years. Both men and women have more living adult daughters than sons. Not surprisingly, many adult children do not co-reside in the same household or compound as the respondent (=parent), and the mean number of co-residing adult children is slightly higher for female respondents than for males (1.64 and 1.47 respectively). Not many adult children have been reported to be in excellent health status, on average the number is slightly higher than one adult child. Few children have been reported to be in very poor, poor or good health (less than one child on average).

Table 3 reveals that received and given financial and non-financial transfers are concentrated between respondents and one child on average. For instance, substantial financial help is given on average only to slightly more than one child. Respondents provide non-financial help to even fewer children, i.e. less than one child on average. The pattern for received financial and non-financial help from children to respondents is very similar: both types of transfers are received primarily from one child, and on average even less than one child provides substantial amount of financial help.

Separating the transfer patterns by gender of the respondent's children reveals that both male and female respondents provide more financial transfers to their sons as compared to their daughters. Specifically, the sex ratio of number of sons to number of daughters among adult children with whom the respondent has exchanged transfers shows that parents give substantial amounts of financial help to 5–10% more sons than daughters, which is striking given the fact that they report to have 4–10% fewer sons than daughters. In contrast, non-financial help from mothers is given to more daughters than sons, while fathers are more likely to support their sons than daughters with non-financial assistance. In terms of transfers from children to their parents (i.e., the respondents in our sample), a higher number of daughters than sons provide large financial and non-financial transfers to their mothers, and specifically, non-financial help to mothers is considerably more likely to be provided by daughters than sons. While more adult daughters than sons support their fathers with substantial amounts of non-financial help, considerably more sons

Table 3: Descriptive statistics for transfer patterns between respondents and their children (respondents aged 30–60)

	Female	Male	Total
Children			
# of children (alive and deceased)	6.67	7.12	6.86
	(2.83)	(3.36)	(3.07)
# of living children	4.92	5.57	5.19
	(2.11)	(2.62)	(2.35)
# of adult living children	2.57	2.35	2.48
	(2.27)	(2.55)	(2.39)
Among respondents with at least one living adult child			
# of adult living children	3.35	3.67	3.46
	(2.02)	(2.30)	(2.13)
Mean age of adult living children	22.77	22.22	22.57
	(6.72)	(6.85)	(6.77)
Sex ratio (# of sons / # of daughters) among living adult children	0.91	0.96	0.93
# of adult living children who are			
coresident (same household or compound)	1.64	1.47	1.58
	(1.36)	(1.45)	(1.40)
in excellent health	1.31	1.46	1.37
	(1.66)	(1.93)	(1.76)
in very poor, poor or good health	0.73	0.84	0.77
	(1.33)	(1.56)	(1.42)
Transfers to/from children			
(Among respondents with at least one living adult child)			
# of adult living children to whom respondent has			
given substantial amount of financial help	1.16	1.48	1.28
	(1.34)	(1.54)	(1.42)
given substantial amount of non-financial help	0.47	0.37	0.43
	(0.92)	(0.98)	(0.94)
# of adult living children from whom respondent has			
received substantial amount of financial help	1.14	0.83	1.03
	(1.51)	(1.33)	(1.45)
received substantial amount of non-financial help	0.55	0.51	0.54
	(0.98)	(1.06)	(1.01)
Sex ratio (# of sons / # of daughters) among children to whom respondent has			
given substantial amount of financial help	1.05	1.10	1.07
given substantial amount of non-financial help	0.79	1.30	0.92
Sex ratio (# of sons / # of daughters) among children from whom respondent has			
received substantial amount of financial help	0.94	1.42	1.06
received substantial amount of non-financial help	0.68	0.85	0.74

than daughters provide substantial amount of financial help to their fathers.

In summary, the descriptive statistics about transfer patterns between respondents and their children in Table 3 reveal several intriguing patterns: First, on average financial and non-monetary transfers of large amounts do not occur between parents and multiple children, but they are concentrated among parents and a small number of children (and often one child on average). Second, respondents tend to transfer more to their sons, which is striking given the fact that they report having more daughters than sons in the household/family rosters. In addition, there is a clear pattern of an alignment of transfers by gender: transfers occur more often between fathers and sons and between mothers and daughters than along the mixed-gender mother–son or father–daughter dyads.

Age Patterns of Intergenerational Transfers in Rural Malawi

Family Structure and Health

To provide the demographic context in which intergenerational transfers occur, we begin our analysis with a description of the family composition in rural Malawi. Specifically, we focus on the number of children and alive parents respondents have and how these numbers change with respondent's age. The left panel of Figure 1 shows the mean number of children ever born, children alive, children below age 15 and adult children above age 15 by age of female respondents, and the right panel shows the same information for male respondents. The observed means of number of children in 5-years age intervals are shown by the dots, and the lines are estimated by using a local polynomial regression fitting procedure from the individual-level data.[21] With very few exceptions, we find similar patterns for male and female respondents. At age 20, female respondents have on average less than 2 children, but the number of children increases with age, and at age 60 female respondents report on average 8 ever-born children. The difference between children ever-born and surviving children increases sharply with age. Female respondents age 50 and above have on average 8 children ever-born, of whom approximately half were alive at the time of the interview. The mean number of alive children below age 15 is highest around age 30 (about 3 children) and declines with age, while the number of older children 15+ years increases with age. At age 20 almost none of the male respondents have children, but by age 60 they have on average about 10 ever-born children. The higher number of children for men is likely due to the fact that about 7% of men in the sample are in polygamous unions, and unmarried men are underrepresented in the MLSFH sample at older ages. Similar to female respondents, by age 60 the difference between children ever-born and children alive is about 4. The mean number of alive children is highest at age 35–40, which is about 5 years later than for women.[22]

Figure 2 shows the proportion of female and male respondents with alive parents, by age of the respondent. The pattern is strikingly similar for both male and female respondents. About 90% of men and women in the age range 20–30 years report having at least one parent alive. 80–90% of respondents below age 30 have alive mothers, while the proportion of those with an alive father in this young age range is lower (60–70%), which reflects higher male mortality. The probability of having alive parents declines with age, and at age 60 only about 35% of respondents report having at least one parent alive, but a much smaller fraction (about 1%) of elderly respondents have both parents alive. In addition, to allow for the assessment of data quality, both panels present information on surviving biological parents that was elicited outside the family/household roster in a separate part of the questionnaire. The two dashed lines referring to biological parents

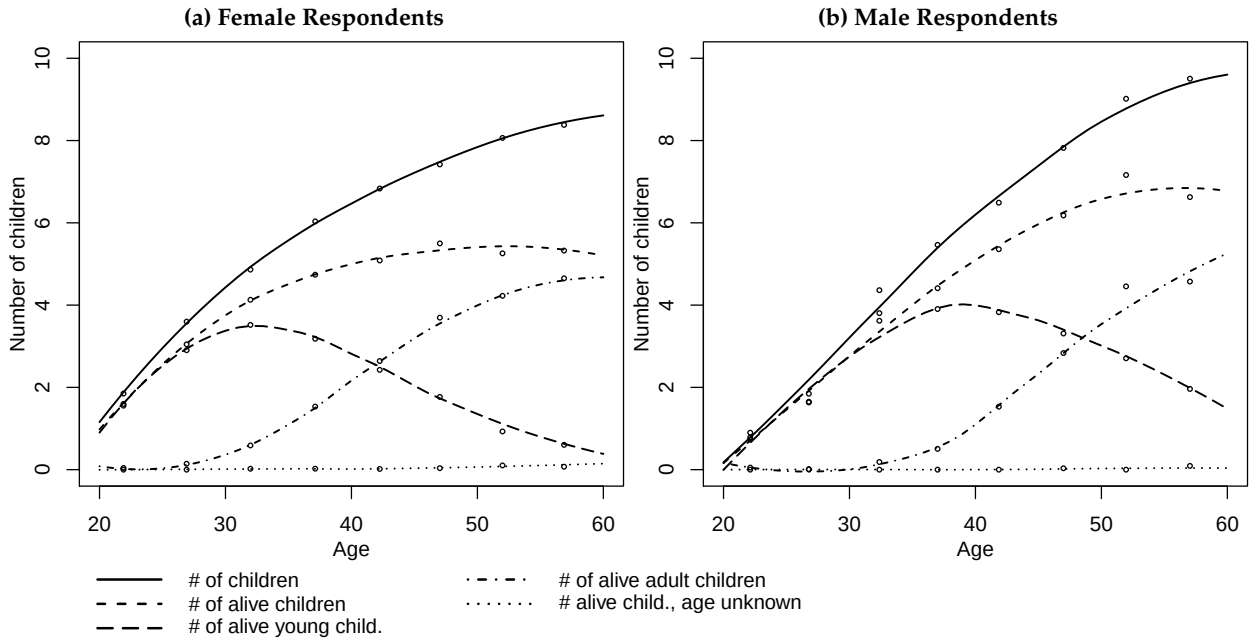

Figure 1: Children of respondents, by respondent's age and gender: Number of children ever born, alive children, alive young children (age < 15), alive adult children (age $\geq$ 15, and children of unknown age

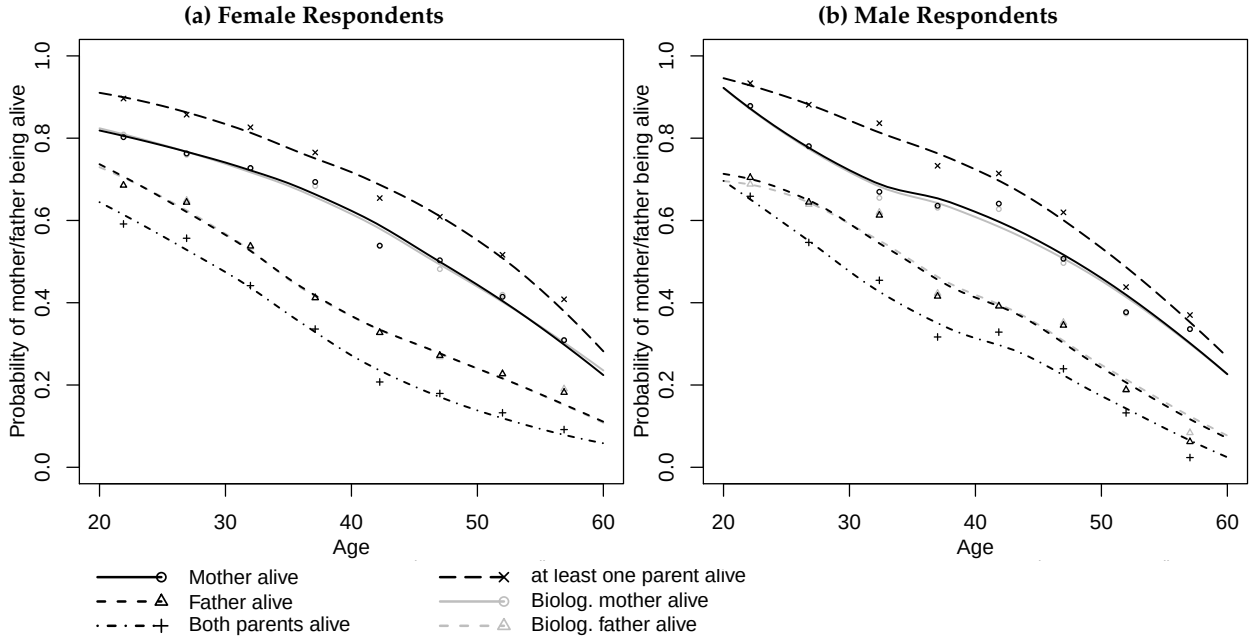

Figure 2: Survival of respondent's parents, by respondent age and gender: probability of mother being alive, father being alive, both parents being alive, at least one parent being alive, biological mother being alive, and biological father being alive

and mother/father in general are almost identical with survival lines for mothers/father obtained from the household/family roster, which suggests that respondents primarily list their biological parents when asked about "parents" in the household roster and that they provide information about parents consistent across different parts of the questionnaire and question formats. More importantly, this implies also that the transfer behavior from the respondent's perspective described later in the paper occurs in most instances among biological children and parents. In addition, calculations from our data show that around 3/4 of female respondents around age 30 do not co-reside with their mother (among respondents aged around 30 whose mother is alive, around 60% do not co-reside with their mother), and this probability declines with respondent's age as a result of the lower probability of having an alive mother.[23,24] Coresidence with fathers is less common, which is to a substantial extent related to the lower probability of fathers being alive, but is also the case for respondents whose father is alive. For example, around age 30, only 10% of female respondents coreside with their fathers in the same household/compound, and this probability declines with age; conditional on the father being alive, around 17% of female respondents coreside with their fathers.

The health of alive parents declines strongly with the respondent's age. For example, in Figure 3 we show the probability that the mother or father is in excellent health or in very poor/poor/good health, conditional on the mother or father being alive (broken lines) and in the overall sample (full lines). A very good or excellent health status among the parents occurs primarily at the lower end of the respondent's age range (20 to 60 years). Conditional on parents being alive, a relatively poor health assessment (defined as very poor/poor/good health status) increases from about 40% at age 20 to about 75% at age 60. Because of the declining probabilities of parents being alive however, in the overall sample this poor health status is relatively constant at around 40% up to about age 45, over which it decreases rapidly. Based on the overall sample, at age 60, less than 20% of respondents have a mother in relatively poor health and virtually no respondents have parents in excellent health status. These probabilities are even smaller for fathers. In summary, Figure 3 suggests that the probability of having dependent parents because of poor health status peaks relatively early in adulthood around ages 30–40, and decreases substantially with age because of high parental mortality in rural Malawi.

Age Patterns of Given and Received Transfers between Respondents and Their Parents

We begin our analyses of intergenerational transfers by investigating the age profile of transfer flows between respondents and their parents. In particular, we draw on the responses to the household/family roster questions on financial and non-financial transfers described in Section that list a parent as a recipient/provider of transfers. Since we are primarily interested in regular—rather than occasional—transfers among respondents and parents, we focus on the indicator of whether the respondent has given or received *a substantial amount* of financial or non-financial transfers. Because the survival of parents is an important determinant of whether the respondent can receive from, or give transfers to his/her mother or father, we show in the subsequent figures (*i*) the transfer patterns conditional on the respondent's mother or father being alive (in the text, we refer to this type of transfers as 'conditional transfers'), and (*ii*) the transfer patterns for the entire sample, unconditional on parental survival (in the text, we refer to this type of transfers as 'unconditional transfers'). The latter is useful to assess the contribution of parental survival to transfers with parents at different stages of a respondent's life-course. The fact that a respondent does not receive transfers from his/her mother can be due to the fact the respondent's mother

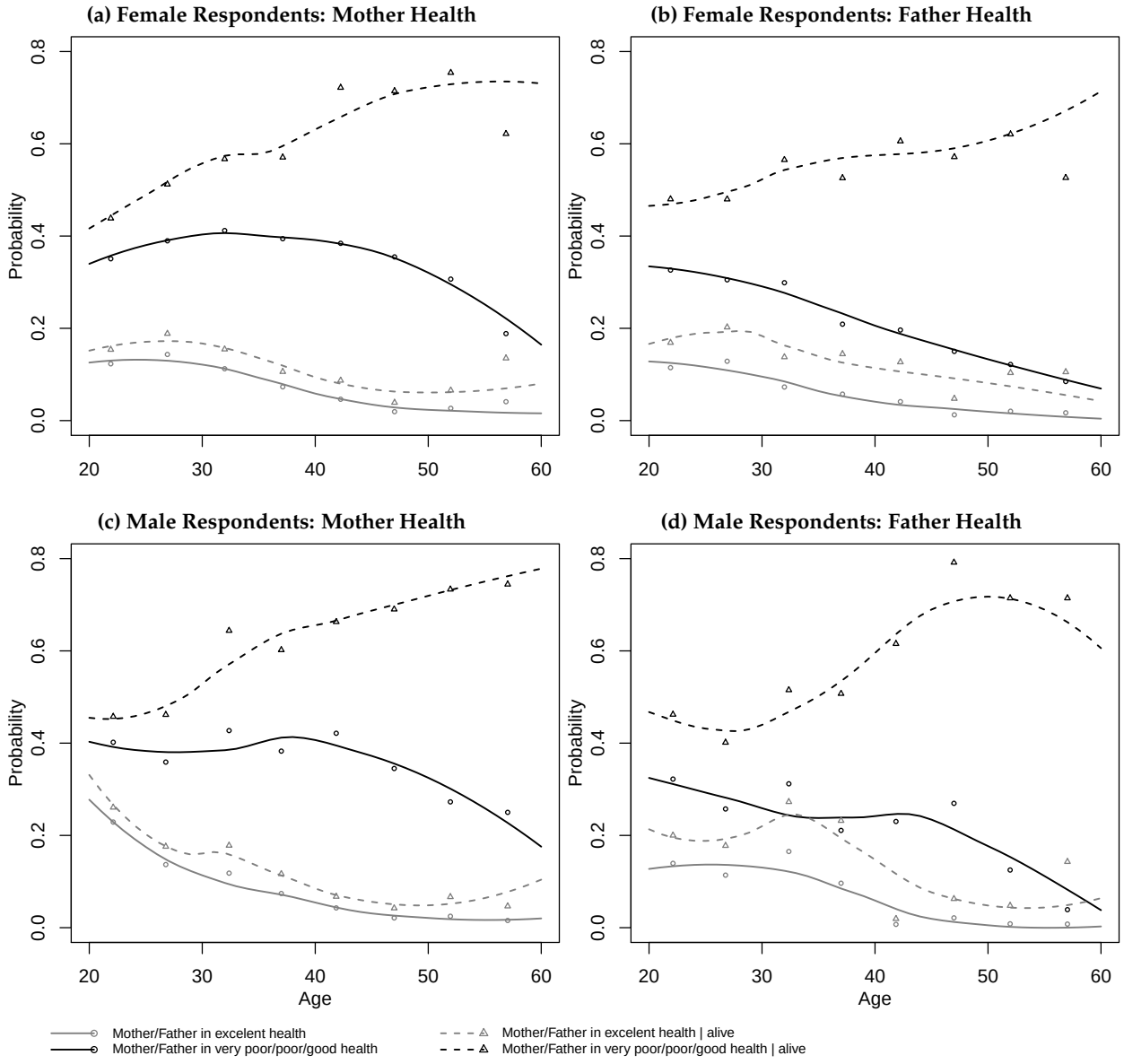

Figure 3: Parental health, by respondent's age and gender: probability that mother or father is (1) excellent health or in (2) very poor/poor/good health, conditional on mother or father being alive and in the overall sample

has deceased, or that he/she does not receive transfers from the mother despite the fact that the mother is alive. The comparison between the conditional and unconditional transfers is important since it reflects the contribution of parental survival to the observed transfer patterns.

The two upper panels in Figure 4 show the age patterns of financial and non-financial transfers given from female respondents (daughters) 20+ years old to their mothers and fathers separately, and the two bottom panels show the patterns of transfers observed for male respondents (sons). Figure 4 reveals a striking similarity in the transfer behavior of daughters and sons towards their parents. In general, both daughters and sons are more likely to provide financial help than non-financial support. Daughters however are more likely to provide financial and non-financial help to their mothers than to their fathers, while the amount of transfers from sons to mothers and fathers is more or less similar. About 40% of daughters and about 60% of sons give financial assistance to their mothers, a pattern that peaks around age 30 and remains more or less constant over age. In contrast, less than 30% of daughters but around 50% of sons provide financial support to their fathers. An equal fraction of about 20% of daughters and sons below age 40 provide non-financial help to fathers. Figure 4 suggests also that non-financial help to parents declines with respondent's age.

Figure 4 reveals a large discrepancy between conditional and unconditional transfers to parents. In particular, the unconditional probabilities for transfers of both types to parents are substantially lower than the ones observed conditional on having alive parents and the fraction of respondents transferring any type of help to elderly parents decreases especially after age 40. For instance, about 25% of daughters 40–50 years old support financially their mothers, a probability that declines to about 10% at age 60. The unconditional probability of having a dependent father is even lower and less than 15% of respondents 40–50 years old provide financial help to their fathers, and less than 10% provide non-financial help.

In Figure 5 we show the transfer patterns from the parents to the respondents, conditional on the mother/father being alive and for the overall sample. At relatively young adult ages, the conditional and unconditional probabilities of receiving transfers from parents are not large although young respondents are fairly likely to have living parents (see Figure 2 for the survival probabilities) and less than 50% of the respondents receive transfers from their elderly parents. In terms of the age pattern of receiving transfers from parents, we observe again relatively similar patterns for male and female respondents: conditional on parents being alive, both male and female respondents are most likely to receive substantial amounts of transfers from their parents when they are below age 30. Conditional on being alive, fathers are more likely to provide financial support to their children: for instance, about 30% of respondents age 20 receive financial help from their fathers and mothers, but only 10% receive non-financial transfers from their fathers and twice as many receive non-financial help from their mothers. When respondents reach age 40, the amount of transfers from their parents decreases substantially and only about 10% of children receive any type of transfers from their mothers and fathers. Moreover, while respondents receive more financial transfers when they are below age 30, at older ages the difference in financial versus non-financial help given from their parents virtually disappears. Respondents older than 50 years receive almost no support from their parents, which is a function of both survival probabilities of parents and transfer behavior.

In Figure 6 we estimate the age pattern of *net transfers* to respondent's parents. Under the assumption that the categorical description "a substantial amount of financial assistance" reflects an approximately equal amount of transfers when a respondent describes the transfers given to and received from one particular parent,[25] we can use it to approximate the net transfers between

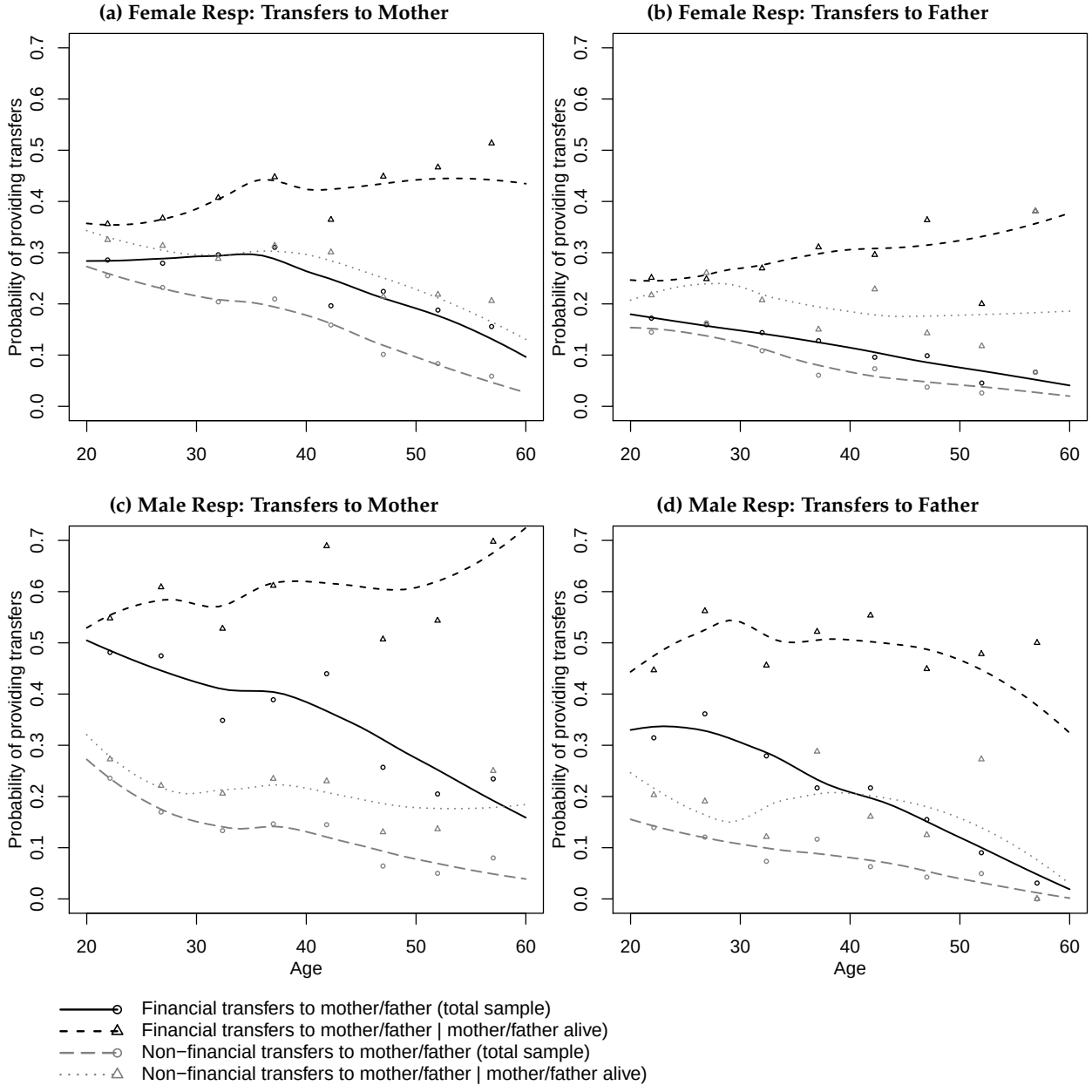

Figure 4: Financial and non-financial transfers *to* mother and father, by respondent age and gender: probability that respondent has given "substantial amount" of financial/non-financial transfers to mother or father, conditional on mother/father being alive (broken lines) and in the overall sample (full lines)

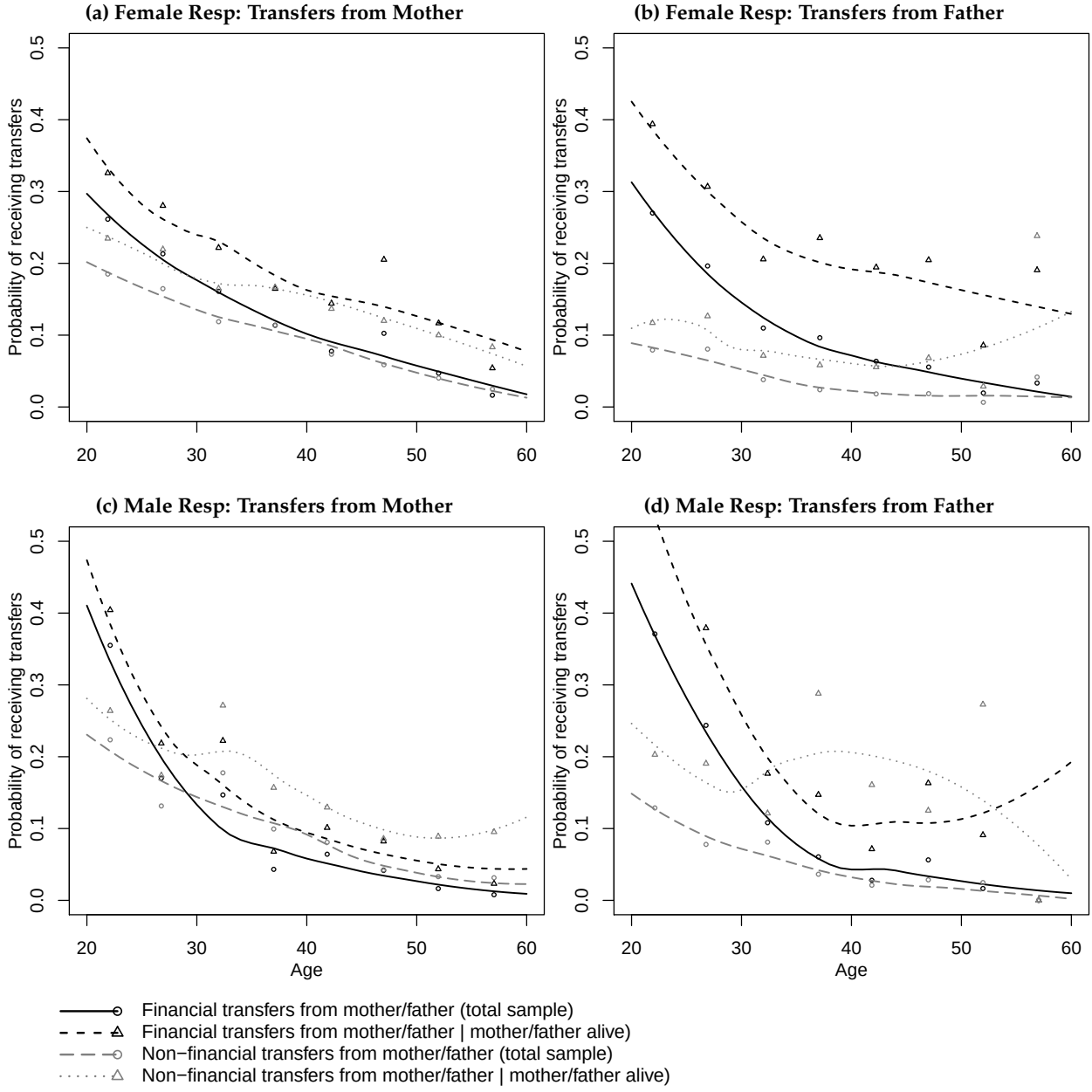

Figure 5: Financial and non-financial transfers *from* mother or father, by respondent age and gender: probability that respondent has received "substantial amount" of financial/non-financial transfers from mother or father, conditional on mother/father being alive (broken lines) and in the overall sample (full lines)

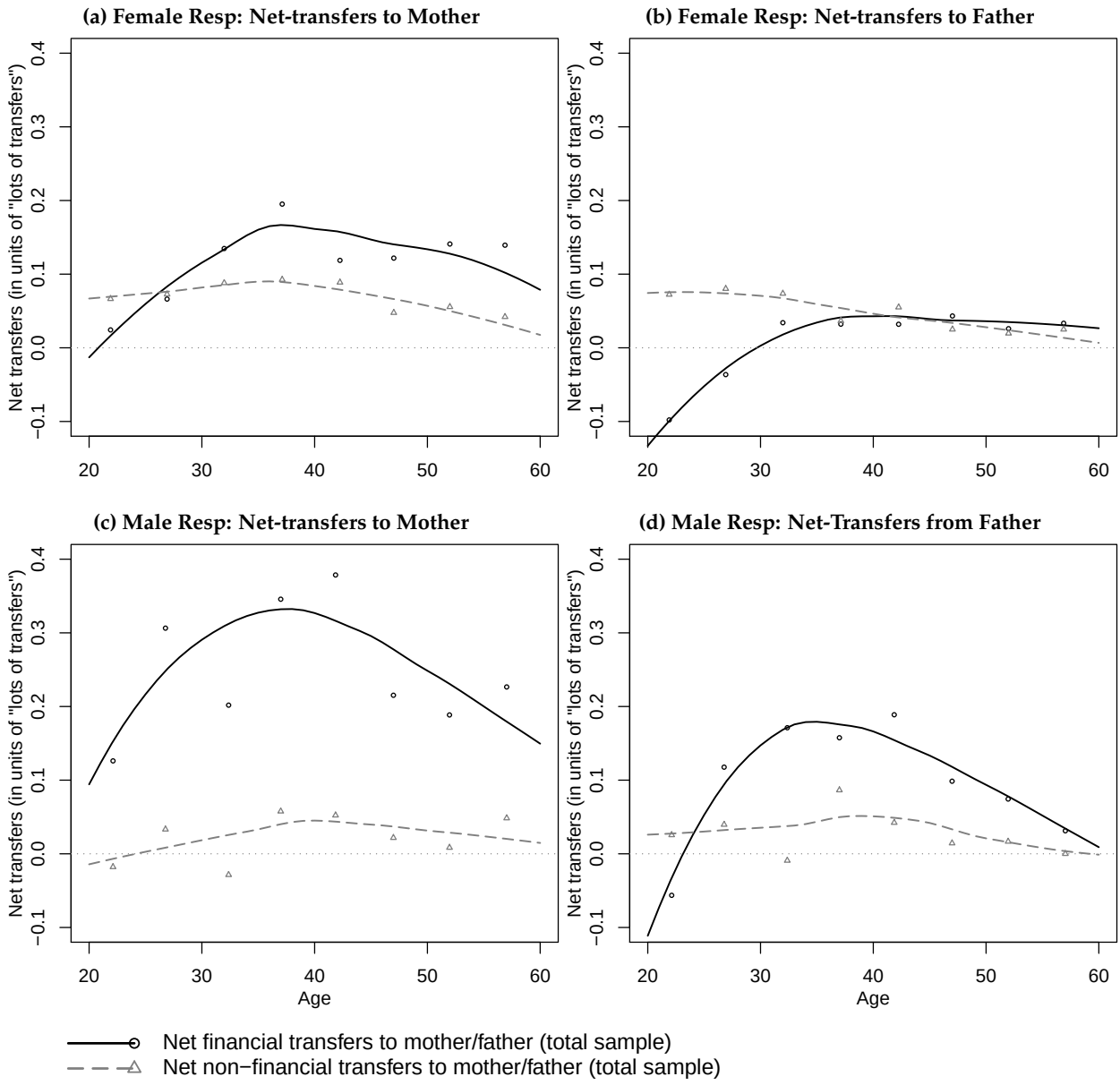

Figure 6: Net financial and non-financial transfers *to* mother or father, by respondent age and gender, conditional on mother/father being alive (broken lines) and in the overall sample (full lines)

Note: See text for the definition and calculation of net transfers.

the respondent and a particular parent. For this purpose, we construct a variable *net transfer to mother* (or *father*) as follows: it equals one if the respondent has given a substantial amount of financial assistance to his/her mother (father) and received from her no or only a little financial assistance in the last two years; it equals zero if the respondent has given a substantial amount of financial assistance to his/her mother (father) and has also received a substantial amount of financial assistance from his/her mother (father), and it equals also zero if the respondent has given no or only little financial assistance to his/her mother (father) and has also received little financial transfer from his/her mother (father); and it equals minus one (-1) if the respondent has given no or only a little financial assistance to his/her mother (father), but has received a substantial amount of financial assistance to his/her mother (father). Moreover, to reflect the net resource flows unconditional on the respondent's mother's/father's survival, we assign the net transfer variable a value of zero if the respondent's mother/father has diseased. An analogous calculation to approximate the *net transfers* to a respondent's mother/father is performed for non-financial transfers, using the binary indicator that the respondents has given to, or received from a parent a substantial amount non-financial help (i.e, help with a frequency of "at least once a month/at least once per week"). It is easiest to interpret the resulting measure of net transfers in terms of a net resource flow that is measured in units of *substantial amounts* of non-financial transfers.

Figure 6 then plots the average net transfers (financial and non-financial) by respondent's age. Several aspects of these net transfers to mothers/fathers are worth noting. ***First***, as shown in the previous figures, while there are clear age patterns for the gross non-financial transfers (non-financial transfers help given or non-financial transfers help received) for females and to a slightly lesser extent for males, the average non-financial net transfers are very low and without any strong age pattern. For example, for women between ages 20–40, there is a net resource flow of .07–.09 such units from the respondents to both her mother and her father. At older ages this net resource flow further diminishes, in part because the frequency of transfers declines (see Figures 4–5) and because parents are less likely to be alive. For male respondents, the net non-financial resource flow across all ages are very small.

For financial transfers, the net resource flow in Figure 6 follows a marked age pattern and is not as balanced as for non-financial help. Between female respondents and their mothers, the net financial flow starts off fairly balanced around age 20, and then rises to a net upward flow—of an average of .2 units of "a substantial amount" of financial assistance—when respondents are in their mid to late 30s. After age 30, the net financial resource flow remains towards the parents, with some marked decline that is only the result of a declining probability of the respondent's mother being alive (Figures 4–5). The net financial transfers between female respondents and their fathers are negative when respondents are in their 20s, indicating an average net resource flow of about .05–.1 units of "a substantial amount" of financial assistance from the father to the respondent; after age 30, the average net resource flow between female respondents and their respondents is very close to zero. This decline of the net resource flow with age is initially the result of a declining probability of fathers making financial transfers to their daughters, and at older ages it results from the declining probability of respondents having an alive father (see Figure 5b).

The net transfer flow in Figure 6 is larger and more age patterned for male respondents. Across all ages, there is a net financial transfer from male respondents to their mothers, starting off at about .1 units of "a substantial amount" of financial assistance and peaking at about .3 of such units when respondents are in their mid to late 30s. This increase in the net upward transfer at young ages is primarily driven by the decline in the downward transfers to the respondents from

their mothers combined with a fairly constant probability of making upward transfers conditional on the mother being alive (see Figures 4–5), while the decline of the net transfer after age 40 results from the declining probability of respondents having alive mothers. The net financial transfer in Figure 6 between male respondents and their fathers follows a similarly inverted U-shape. At young ages in the early 20s, there is a net resource flow to respondents from their fathers, resulting from a high probability of fathers making downward transfers combined with a more moderate probability of making upward financial transfers. The net transfer flow is towards the father for respondents age 25 and higher, and peaking also in the mid to late 30s at about .2 units of "a substantial amount" of financial assistance; this increase is primarily driven by a declining probability of receiving downward transfers from parents, while male respondents maintain a fairly constant probability of making upward financial transfers conditional on the father being alive (see Figure 4d). The decline of the net transfer towards zero above age 40 is again importantly driven by the declining probability of a respondent having an alive father.

In summary, while recognizing the limitations of this approach due to the lack a detailed quantitative measurement of transfers, our analyses in Figure 6 suggest that net non-financial transfers are relatively insignificant across all ages for both male and female respondents. At the respondent's early adult ages, when parents are likely to be alive, there is a fair extent of mutual assistance between respondents and their parents (see Figures 4–5), but in terms of net flows the help given and received are approximately balanced and results in a relatively insignificant re-allocation of resources between generations. In contrast, the net resource flows are both significant and strongly age patterned—following an inverted U-shape—for financial assistance. In particular, male respondents provide significant net upward transfers to their parents (mother and father) in their primary adult ages (30–50 years of age). The increase in the net upward resource flow between male respondents and their parents at young ages is primarily the result of a declining probability of receiving financial assistance from parents, while the decline in the net upward flow after age 40 is primarily the result of declining parental survival (Figures 4–5). The transfers between female respondents and their mothers follow a similar pattern, albeit with a smaller net resource reallocation, while the transfers between female respondents and their fathers are the only ones that are characterized by a net downward transfers to the respondent from their fathers at ages 20–30 that is not followed by a significant net upward transfer at older ages.

Age Patterns of Transfers between Respondents and Their Children

As shown in Figure 1, MLSFH respondents themselves have high numbers of children, and in addition to engaging in transfer interactions with their parents, are thus potentially engaged in a rich set of intergenerational transfer relations with their children. Therefore, it is of interest to investigate the transfer behavior between them and their adult children, especially since transfers to their children are in a way competing with the amount of transfers given to their parents. Our focus is on transfer relationships between respondents and their adult children, who are defined in our analyses as children at least 15 years old. Since virtually no respondents below age 30 have adult children, we restrict this analysis to respondents 30 years old and above. We present results for female respondents, but the transfer patterns between male respondents and their children are very similar and we summarize them later in this section.

The upper left panel of Figure 7 shows the flow of transfers between respondents and their adult children conditional on a respondent having at least one child 15+ years old. When in their early 30s, about 50% of female respondents who have at least one adult living child provide

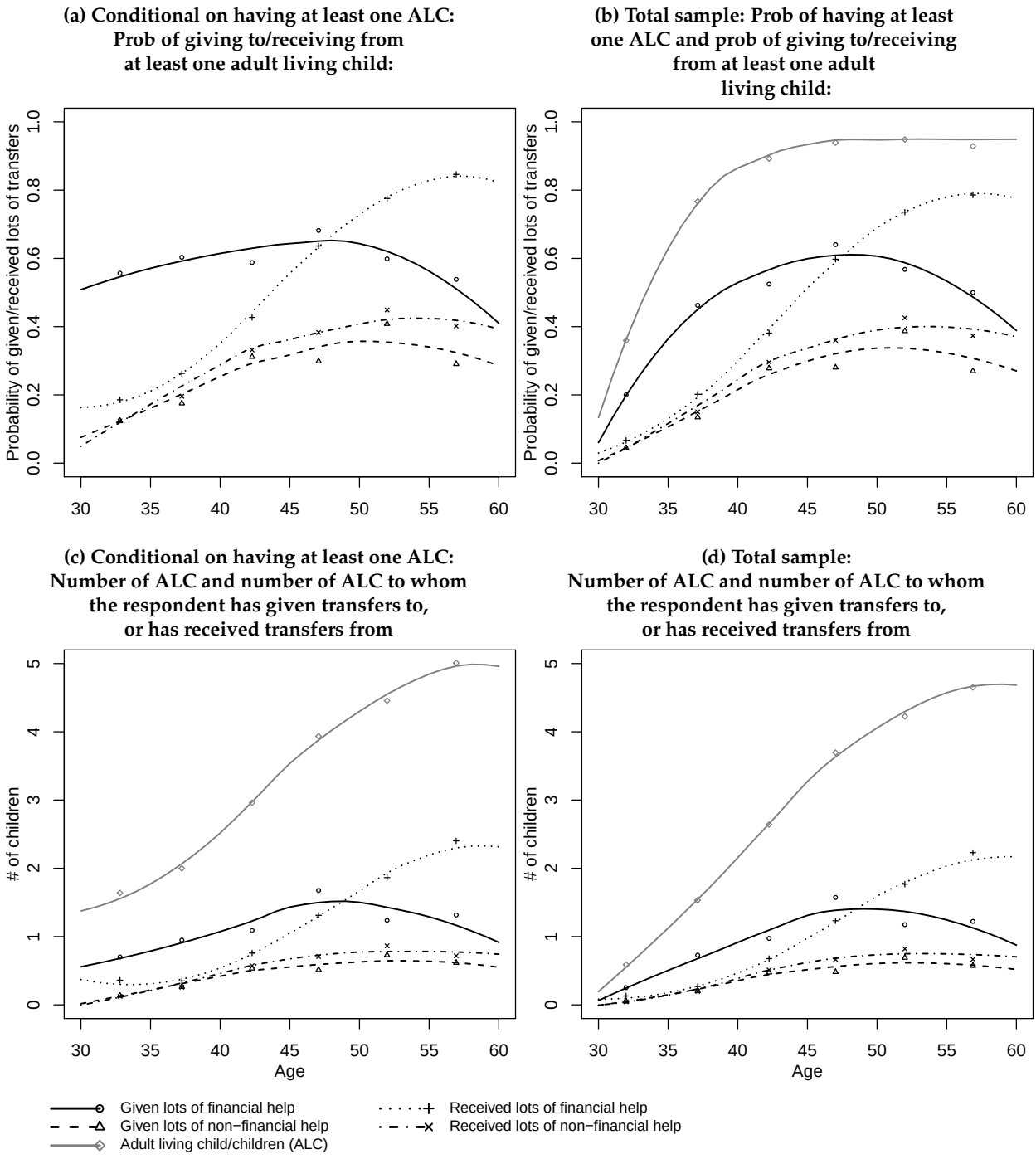

Figure 7: Transfers to and from adult living children (ALC) (female respondents)

substantial amount of financial help to at least one adult child. This fraction increases to 60% among respondents age 50, and declines sharply afterward to 30% for respondents around age 60. The fraction of female respondents (with adult children) who receive substantial amount of non-financial help from at least one adult child increases and peaks around age 50, where it levels off at around 30–40%. While very few respondents receive financial help from their adult children at younger ages, even in the presence of an alive adult child, around 80% of women who have adult living children receive financial transfers from at least one adult child after age 50. In contrast, the fraction of respondents with adult living children who receive non-financial support from at least one adult child is substantially lower. For example, at age 50 and above, on average only 40% of female respondents who have adult living children receive substantial non-financial help from at least one of their adult children.

The upper right panel of Figure 7 shows the transfers between respondents and their adult children unconditional on having at least one child 15+ years old. The graph shows that by age 40, almost all female respondents have at least one living adult child, and this proportion increases rapidly between ages 30–40. At the lower end of this age range, very few female respondents give financial transfers to adult children, and even fewer receive such transfers from their children, primarily because a low proportion of female respondents who have adult living children. The peaks of transfer flows are observed after age 50, when about 60% of respondents give substantial financial help to at least one adult child, and 80% receive substantial amount of financial support from at least one adult child. The peak for given and received non-financial transfers occurs also around age 50 and levels off at older ages, albeit such transfers occur with lower frequency.

The bottom two panels of Figure 7 show the transfer patterns depending on the number of children respondents have. Conditional on having at least one child 15+ years old, female respondents have on average five alive adult children by age 55–60 (lower left panel). The most striking feature revealed in this graph is that although respondents have high numbers of adult children at age 45, which is the peak when transfers to children occur, financial help is given to only a small number of these adult children, on average to only one child. By age 55, when the peak for received financial help from children occurs, respondents receive on average transfers from 2 adult children. The difference between the total number of alive adult children and the number of children providing and receiving non-financial help is even much larger. By respondent's age 50, on average less than one child receives or provides non-financial support. The bottom right panel shows the above transfer patterns unconditional on having at least one alive adult child. The primary difference between this graph and the bottom left panel occurs below age 40, when very few respondents have children age 15 and above and thus almost no transfers are observed.

With few exceptions, the patterns of intergenerational transfers between male respondents and their adult children are very similar to the ones for female respondents. For male respondents we estimate a slightly older age pattern for providing financial help to adult children, the peak of which occurs around respondent's age 55. The peak of received transfers from adult children occurs also at older age, and by age 55-60 male respondents receive help on average from one child which is in contrast to the estimates for female respondents who on average received help from a larger number of children.

Figure 8 summarizes the transfers from respondents to their adult living children (ALC) in terms of net resource flows, following a similar approach as for parents that approximates the net resource flow from the respondent's categorical responses (see previous section). For non-financial transfers, Figure 8 reveals a pattern similar to that observed for transfers between respondents and their parents: despite the fact that the number of ALC varies substantially across a respondent's

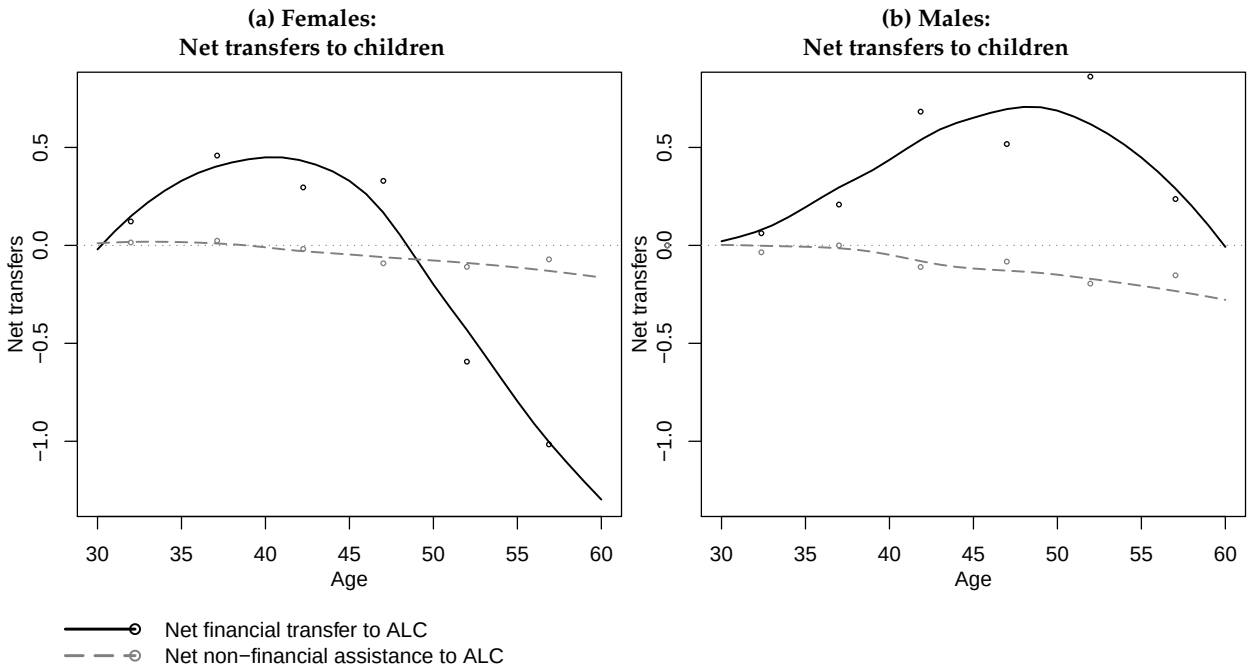

Figure 8: Net transfers (financial and non-financial) to adult living children (ALC)

life course, and that there is a reasonable amount of mutual non-financial help between respondents and their children (Figure 7), the *net* resource flows as a result of these transfers seems to be relatively small and there is *no* marked age pattern for either male or female respondents. In contrast, net resource flows as a result of financial transfers between respondents and their ALC follow a marked age-pattern that indicates important differences in the flow of resources between respondents and their children across the life course. Around age 30, the net transfers to ALC are very small because respondents tend to have a very small number of ALC (conditional on having an ALC, respondents are likely to make a net downward transfers even around age 30; see Figure 7a). For both male and female respondents, the net financial transfer is towards children at primary adult ages. For female respondents, the net financial transfers peak at an age around 40 years, and decline thereafter; after age 50, the direction of net transfers changes and female respondents become net recipients of transfers from their children. This net resource flow is relatively substantial, allocating approximately 1-unit of "a substantial amount of financial assistance" from children to their mothers. For men, we estimate an inverted U-shape with a peak of the net financial transfer flow to children when respondents are about 50 years old, but adult children remain recipients of net financial transfers until about respondent's age 60.

In summary, while recognizing again the limitations due to the lack of a quantitative measurement of resource flows, our analyses of *net* transfer flows between respondents and their parents/children in Figures 6 and 8 point to some important patterns: First, in terms of resource allocation between generations, non-financial assistance is relatively unimportant despite the fact that there is extensive—and also sometimes age-patterned—mutual non-financial help across the generations. Second, financial transfers to both children and parents are strongly age-patterned and peak in mid-to-late adult ages: both male and female respondents age 40–45 provide substantial upward transfers to their parents (possibly more extensive for female than for male respondents),

and at the same time, they make substantial downward transfers to their ALC (possibly more extensive for male than for female respondents).

Correlates of transfer patterns to/with parents

In this section, we investigate the correlates of financial and non-financial transfer patterns between respondents and their parents. Because of the limited information about intergenerational transfer patterns in the sub-Saharan African context we focus here on descriptive analyses that identify the main correlates of intergenerational transfers in the context of rural Malawi, and we do not attempt to identify causal relationships. The regression analyses summarized below are also conditional on the potential transfer partner—respondent's mother or father—being alive, and the analyses thus do not consider the correlates of parental survival or the potential selective nature of respondents whose mother or father was alive in 2008. Despite these limitations, the analyses are useful because they provide for the first time in a sub-Saharan context evidence about the extent to which transfers between individuals and their parents are correlated with respondent's demographic, socioeconomic and health conditions, and with the health of their parents.

Our analyses of the correlates of transfer patterns are based on two sets of models. First, we discuss OLS regressions for the *net financial* and *net non-financial* transfers to parents as dependent variables; second, we present corresponding logistic regression analyses for the dependent variables indicating whether a respondent has given or has received ***a substantial amount*** of transfers as defined earlier in the data description. To limit the number of analyses that need to be reported, we tested whether the estimated relationships differ between male and female respondents, and between regions. With few exceptions discussed below, the correlates of transfer patterns did not differ by sex of the respondent or the parent, and thus we pooled the regressions for male and female respondents as well as for fathers and mothers. We report in Tables 4–5 the results of these pooled analyses for *net* financial and non-financial transfers to parents, and additional analyses for providing and receiving financial/non-financial transfers are summarized in the Appendix Tables A.1–A.4.

In terms of explanatory variables, the particular focus in these analyses is on the associations of transfer patterns with (*i*) demographic and socioeconomic characteristics of the respondents such as respondent's age, education, and wealth; (*ii*) respondent's and parents' health status, including self-reported health status, actual HIV+ status and self-perception of being infected with HIV; (*iii*) the respondent's number of living young (below age 15) and adult (age 15+) children, as well as the total net financial and net non-financial transfers given from and to ALC. Respondent's wealth is measured by the respondent's household wealth quintile (ranging from 1 to 5). HIV+ status is obtained from the most recent HIV test in which a respondent participated. The respondent's subjective likelihood of HIV infection is coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood, while for a respondent's subjective health we created indicators of whether the respondent is in excellent health, in very good heath (reference category), and in very poor/poor or good health. Similar indicators were also created to describe the health of a respondent's mother or father (see also Tables 1–2). In addition to the coefficients shown in Tables 4–5, all analyses control for respondent's age, age^2, co-residence of the parents, and region of residence (north, south, central). These latter coefficients are allowed to vary by sex of the respondents and parents.

The key findings of our analyses about the correlates of transfers between respondents and

Table 4: Pooled analyses: regression for net financial transfers to parent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	0.002	-0.029	-0.027	-0.024	-0.023	-0.020	-0.027	-0.029	-0.026	-0.028
	(0.034)	(0.035)	(0.038)	(0.035)	(0.040)	(0.041)	(0.035)	(0.034)	(0.035)	(0.034)
Secondary schooling or more	-0.084^{+}	-0.138**	-0.137*	-0.125*	-0.106^{+}	-0.092	-0.123*	-0.122*	-0.122*	-0.121*
	(0.049)	(0.050)	(0.054)	(0.050)	(0.057)	(0.059)	(0.050)	(0.050)	(0.050)	(0.050)
Respondent's wealth quintile		0.044**	0.038**	0.044**	0.034**	0.031**	0.044**	0.042**	0.043**	0.042**
		(0.009)	(0.010)	(0.009)	(0.011)	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)
Respondent is HIV+			0.008							
			(0.052)							
Respondent's subj. likelihood of HIV infection†				0.000						
				(0.013)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					0.024	0.016				
					(0.031)	(0.031)				
Resp. is in excellent health					0.038	0.034				
					(0.037)	(0.038)				
Parent is in very poor/poor/good health						0.054^{+}				
						(0.029)				
Parent is in excellent health						-0.004				
						(0.040)				
Respondent's children										
# of young living children							0.023**	0.023**	0.023**	0.023**
							(0.008)	(0.008)	(0.008)	(0.008)
# of adult living children							0.003	-0.003	0.004	-0.003
							(0.010)	(0.010)	(0.010)	(0.010)
Total net transfers to adult living children										
net financial transfer								0.035*		0.036**
								(0.014)		(0.014)
net non-financial transfer									-0.042	-0.046^{+}
									(0.026)	(0.027)
Observations	3325	3238	2811	3177	2523	2463	3238	3238	3238	3238

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

Table 5: Pooled analyses: regression for net non-financial transfers to parent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	-0.001	-0.003	-0.020	-0.008	-0.006	-0.010	-0.004	-0.004	-0.004	-0.003
	(0.025)	(0.026)	(0.029)	(0.026)	(0.030)	(0.031)	(0.026)	(0.026)	(0.026)	(0.026)
Secondary schooling or more	0.003	-0.001	-0.014	-0.006	-0.030	-0.032	-0.007	-0.007	-0.006	-0.007
	(0.035)	(0.037)	(0.042)	(0.037)	(0.045)	(0.047)	(0.037)	(0.037)	(0.037)	(0.037)
Respondent's wealth quintile		0.007	0.006	0.009	0.011	0.010	0.008	0.008	0.008	0.008
		(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Respondent is HIV+			-0.005							
			(0.036)							
Respondent's subj. likelihood of HIV infection†				0.019*						
				(0.009)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					-0.022	-0.025				
					(0.022)	(0.022)				
Resp. is in excellent health					-0.004	-0.006				
					(0.025)	(0.026)				
Parent is in very poor/poor/good health						0.023				
						(0.020)				
Parent is in excellent health						-0.006				
						(0.029)				
Respondent's children										
# of young living children							-0.004	-0.004	-0.004	-0.004
							(0.006)	(0.006)	(0.006)	(0.006)
# of adult living children							-0.011	-0.010	-0.010	-0.010
							(0.008)	(0.008)	(0.007)	(0.007)
Total net transfers to adult living children										
net financial transfer								-0.005		-0.004
								(0.009)		(0.009)
net non-financial transfer									-0.026	-0.025
									(0.022)	(0.022)
Observations	3032	2955	2543	2899	2295	2235	2955	2955	2955	2955

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

their parents are as follows (see Tables 4–5):[26]

Respondent's level of schooling: In general we do not find a strong association between respondent's level of schooling and financial and non-financial transfers given to parents and received from parents. One exception from this pattern is noticeable: contrary to hypotheses expected from the parental repayment hypothesis for intergenerational transfers (Becker and Tomes 1976, Lillard and Willis 1997, Raut and Tran 2005), there tends to be a negative association of secondary schooling with net financial transfers to parents, which is due to the fact that respondents with a secondary or higher level of schooling have more than twice higher odds of receiving a substantial amount of financial transfers from their parents as opposed to respondents with low level of schooling (Table A.3).

Respondent's wealth quintile: Respondent's wealth quintile is strongly associated with the net financial transfers provided to parents, and wealthier respondents are therefore more likely to be the net providers of financial transfers to parents. This association results from the fact that wealthier respondents are more likely to provide substantial financial assistance to their parents (Table A.1). Respondent's wealth is generally not associated with the net flow of non-financial transfers between respondents and their parents.

Measures of respondent's health status: One of the most intriguing results shown in Tables 4–5 is that measures of respondent's health status—including the respondent's HIV+ status, his/her perception of being infected with HIV, and subjective health—are generally not associated with net financial or net non-financial transfers given to parents. The only exception from this general pattern is the positive association of a respondent's subjective likelihood of HIV infection with the provision of net non-financial transfers to parents, which occurs because these respondents have a higher likelihood of providing non-financial transfers to parents (Table A.2).

Measures of parental health status: Generally parental health status is also not associated with the provision of both financial and non-financial transfers between respondents and parents. The only exception to this pattern is a weak association indicating that respondents provide somewhat higher net financial transfers to parents who are in relatively poor health (classified in the analyses as "very poor/poor/good health"), which is due to the fact that parents in relatively poor health are somewhat less likely to provide a substantial amount of transfers to their children (=respondents) (Table A.3). An excellent health status of the respondent's parent is associated with a higher probability for the respondent of both receiving and providing a substantial amount of non-financial transfers to his/her parents (Tables A.2 and A.4), resulting in a pattern where the net non-financial flow in Table 5 is not associated with an excellent parental health status.

Presence of, and intergenerational transfers with respondent's children: Respondents with higher number young children provide higher net financial transfers to their parents, which is due to a negative association of the respondent's number of young children with the probability of receiving a substantial amount of financial transfers from their parents (Table A.3). The respondent's number of adult children is not associated with the net or gross financial transfers of the respondent with his/her parents. We also find strong positive association between respondent's providing net financial transfers to their children and their parents, which occurs because respondents who provide higher net transfers to their children are more likely to provide a substantial amount of financial transfers to their parents.

Coresidence with parents: While we don't report the coefficients indicating the association of net financial/non-financial transfers with coresidence of parents (i.e., mother/father living in the same household or compound than the respondent), we comment briefly on these relationships. Coresidence is important since the transfer questions included in the MLSFH may only partially

capture the exchange relations among respondents and their parents if they live in the same household or compound. Our data do not permit us to investigate this possibility in detail. However, while in general there is no association between coresidence and gross or net transfers measured in the MLSFH, some specific associations suggest that the MLSFH survey was able to capture differences in transfer patterns by coresidence. For example, for female respondents, coresidence with the mother is associated with less financial transfers to mothers, and with slightly higher non-financial transfers to mothers. Females' financial transfers to fathers are not associated with co-residence of the father, while non-financial transfers have a positive association with coresidence. For male respondents, co-residence with the mother is weakly associated with higher net financial transfers to the mother. In all cases, controlling for the respondent's and/or parent's health status tends to reduce these associations of coresidence with net transfers, often rendering the associations statistically insignificant.

Correlates of transfer patterns to/with adult children

Tables 6–7 provide a corresponding set of analyses describing the net financial and net non-financial transfers of respondents with their living adult children, and the corresponding analyses of the gross transfers with adult children are reported in Appendix Tables A.5–A.8.

The dependent variables in Tables 6–7 are the *net financial* and *net non-financial* transfers given to ALC aged 15 and above that are calculated as the sum of the gross transfers (providing/receiving substantial amounts of transfers from children) across all adult children.[27] The particular focus of our analyses in Tables 6–7 is on the association of the respondent's net transfers to his/her children with respondent's and adult children's health, respondent's demographic and family characteristics and respondent's transfer patterns with his/her elderly parents. Similarly to the analyses for transfers with parents, we pool respondents by sex since we did not find any sex-specific differences in the transfer behavior between men and women and their children. All of the analyses that focus on transfer patterns with adult children are conditional on the respondent having at least one adult living child (ALC) age 15+. The analyses therefore show the extent to which parents who have at least one ALC give transfers to, or receive transfers from, their adult children, and how these transfer patterns vary by respondent's health and socioeconomic/demographic contexts. As a consequence of conditioning on having at least one ALC, our results do not reflect the extent to which these factors affect the probability of having at least one ALC. The results, however, do shed light on the question of whether transfers with children—among respondents who have ALC—do vary by health, wealth or family structure.

Specifically, the explanatory variables in these analyses include: the respondent's number of adult living sons and daughters aged 15 and above, the mean age of ALC, the respondent's number of young living children below age 15; the respondent's wealth (measured by the wealth quintile, coded 1–5), HIV+ status, subjective likelihood of HIV+ infection, and subjective health using indicators of whether the respondent is in excellent health, in very good heath (reference category), and in very poor/poor or good health. The respondent's family/household context is described by: the number of ALC who are in very poor/poor/good health, in excellent health, non-coresident with the respondent (= not living in same household or compound); the number of respondent's parents who are alive (coded as zero, one or two), and the net financial and non-financial transfers given to the respondent's parents. In addition, in our models we control for respondent's age, age^2, respondent's level of schooling (less than primary schooling, primary

Table 6: Pooled respondents: regression for the net financial transfers (units of "lot's of transfers") to adult living children (ALC)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	0.151	0.040	0.035	0.027	0.076	0.071	0.075	0.016	0.041	0.076
	(0.106)	(0.109)	(0.120)	(0.111)	(0.124)	(0.124)	(0.106)	(0.108)	(0.109)	(0.126)
Secondary schooling or more	0.002	-0.207	-0.109	-0.217	-0.074	-0.086	-0.108	-0.255	-0.209	-0.071
	(0.236)	(0.243)	(0.243)	(0.250)	(0.256)	(0.257)	(0.242)	(0.243)	(0.252)	(0.270)
# of adult living sons	0.014	-0.005	0.003	0.003	0.010	-0.029	0.125*	0.027	0.137**	0.125+
	(0.051)	(0.052)	(0.055)	(0.053)	(0.060)	(0.072)	(0.049)	(0.047)	(0.050)	(0.065)
# of adult living daughters	0.015	-0.001	0.016	-0.002	0.038	-0.012	0.171**	0.018	0.170**	0.186**
	(0.042)	(0.042)	(0.047)	(0.043)	(0.046)	(0.059)	(0.047)	(0.041)	(0.050)	(0.059)
Mean age of adult living children (ALC)	-0.053**	-0.057**	-0.053**	-0.058**	-0.052**	-0.052**	-0.052**	-0.055**	-0.052**	-0.049**
	(0.010)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.010)	(0.011)	(0.010)	(0.011)
# of alive young children	0.027	0.017	0.023	0.017	0.015	0.012	0.019	0.008	0.016	0.018
	(0.027)	(0.027)	(0.027)	(0.028)	(0.028)	(0.028)	(0.026)	(0.027)	(0.027)	(0.028)
Respondent's wealth quintile		0.180**	0.184**	0.182**	0.170**	0.168**	0.177**	0.176**	0.160**	0.155**
		(0.031)	(0.033)	(0.032)	(0.033)	(0.033)	(0.031)	(0.032)	(0.032)	(0.034)
Respondent is HIV+			0.092							
			(0.148)							
Respondent's subj. likelihood of HIV infection†				0.008						
				(0.043)						
Resp. is in very poor/poor/good health					-0.048	-0.056				-0.009
					(0.097)	(0.096)				(0.099)
Resp. is in excellent health					0.156	0.163				0.063
					(0.136)	(0.136)				(0.137)
# of ALC who are in very poor/poor/good health						0.110+				0.105+
						(0.061)				(0.060)
# of ALC who are in excellent health						0.040				0.015
						(0.051)				(0.047)
# of non-coresident ALC							-0.253**		-0.229**	-0.239**
							(0.049)		(0.048)	(0.048)
# of parents who are alive								0.102+	0.054	0.032
								(0.058)	(0.060)	(0.066)
Total net transfers to parents										
net financial transfer									0.225**	0.297**
									(0.077)	(0.081)
net non-financial transfer									-0.132	-0.169+
									(0.089)	(0.095)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

Table 7: Pooled respondents: regression for the net non-financial transfers (units of "lot's of transfers") to adult living children (ALC)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	0.023	0.013	-0.009	0.010	0.010	0.010	0.014	-0.001	-0.003	0.012
	(0.048)	(0.051)	(0.056)	(0.052)	(0.056)	(0.056)	(0.051)	(0.051)	(0.051)	(0.058)
Secondary schooling or more	0.174^{+}	0.155	0.112	0.154	0.088	0.086	0.159	0.142	0.161	0.120
	(0.104)	(0.109)	(0.112)	(0.112)	(0.111)	(0.111)	(0.109)	(0.110)	(0.117)	(0.121)
# of adult living sons	0.025	0.022	-0.020	0.023	-0.019	-0.017	0.028	0.027	0.022	0.005
	(0.029)	(0.031)	(0.025)	(0.032)	(0.028)	(0.031)	(0.026)	(0.031)	(0.026)	(0.032)
# of adult living daughters	-0.068**	-0.070**	-0.074*	-0.071**	-0.048*	-0.048^{+}	-0.063*	-0.070**	-0.078*	-0.021
	(0.026)	(0.026)	(0.030)	(0.027)	(0.021)	(0.026)	(0.029)	(0.027)	(0.031)	(0.029)
Mean age of adult living children (ALC)	-0.006	-0.007	-0.008	-0.008	-0.004	-0.004	-0.007	-0.008	-0.008	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.003)
# of alive young children	-0.000	-0.003	-0.008	-0.003	-0.010	-0.010	-0.003	-0.003	-0.005	-0.012
	(0.015)	(0.015)	(0.016)	(0.015)	(0.017)	(0.017)	(0.015)	(0.015)	(0.016)	(0.017)
Respondent's wealth quintile		0.012	0.017	0.012	0.013	0.013	0.012	0.012	0.016	0.015
		(0.017)	(0.018)	(0.018)	(0.016)	(0.016)	(0.017)	(0.018)	(0.018)	(0.017)
Respondent is HIV+			-0.050							
			(0.073)							
Respondent's subj. likelihood of HIV infection†				0.007						
				(0.020)						
Resp. is in very poor/poor/good health					-0.020	-0.026				-0.011
					(0.045)	(0.045)				(0.048)
Resp. is in excellent health					0.017	0.018				0.005
					(0.082)	(0.082)				(0.084)
# of ALC who are in very poor/poor/good health						0.013				0.001
						(0.027)				(0.028)
# of ALC who are in excellent health						-0.014				-0.023
						(0.023)				(0.023)
# of non-coresident ALC							-0.010		0.004	-0.026
							(0.032)		(0.033)	(0.027)
# of parents who are alive								-0.028	-0.013	-0.022
								(0.029)	(0.034)	(0.036)
Total net transfers to parents										
net financial transfer									-0.066	-0.019
									(0.040)	(0.034)
net non-financial transfer									-0.053	-0.093
									(0.058)	(0.064)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

schooling, secondary or higher schooling), and region of residence (north, south, central).

The key findings of our analyses in Tables 6–7 are as follows:

Respondent's schooling and wealth: Respondent's level of schooling is not associated with the net financial and non-financial transfers to adult children. Wealthier respondents provide higher net transfers to their adult children, which is due to the fact that they are more likely to provide substantial amounts of financial transfers to them (Table A.5); receiving financial transfers from children is not associated with the respondent's wealth. Wealth is also not associated with the net non-financial transfers with adult children, and neither are the underlying patterns of providing or receiving substantial amounts of non-financial help).

Respondent's family composition: A higher number of adult living sons and daughters is generally associated with higher financial and non-financial transfers given to and received from adult children (Tables A.5 and A.7), and as a result, the net financial transfer to children in Table 6 is mostly not associated with the number of living sons and daughters. The number of adult living sons is also not associated with the net non-financial transfers to children. However, a higher number of adult living daughters is negatively associated with the net non-financial transfers to children, due to the fact that respondents with a larger number of adult daughters tend to receive more non-financial transfers from their adult children. The mean age of ALC is negatively associated with the net financial transfers from respondents, which reflects the pattern that respondents provide fewer substantial amounts of financial help to older children and receive more gross financial transfers from older children (Tables A.5 and A.7). Mean age of adult children is not associated with the net non-financial help to adult children. Similarly, the total number of young living children (i.e., children below age 15), which possibly compete with adult children for parental time and resources, does not predict net transfer patterns between respondents and their adult children. A larger number of non-co-resident ALC is associated with less net financial transfers to adult children. This pattern is due to the fact that respondents are less likely to provide substantial amounts of financial help to non-coresiding children, and are more likely to receive substantial amounts of financial help from these children. Net non-financial transfers are not correlated with the number of non-co-resident ALC, and the number of respondent's parents who are alive is generally not associated with the net financial/non-financial transfers between respondents and their ALC.

Measures of respondent's and children's health status: Similar to our findings regarding transfers between respondents and their parents, the net financial and non-financial transfers between respondents and their adult children are generally not associated with the respondent's health status, including the respondent's HIV+ status, perception of HIV infection and self-rated health (and neither are the underlying gross financial/non-financial transfers). There is weak positive association between the number of ALC in relatively poor health and the net financial transfers to ALC.

Presence of, and intergenerational transfers with respondent's parents: Similarly to the results shown for net financial transfers between respondents and their parents, we find a strong positive relationship between respondent's providing net financial transfers to their adult children and their elderly parents. That is, respondents who provide more net financial transfers to their parents are also providing larger net financial transfers to their adult children. This pattern is consistent with an interpretation that some unobserved factors—such as unobserved aspects of wealth, income, health or levels of altruism towards parents/children—affect a respondents provision of transfers to both parents and children, and this pattern is inconsistent with a notion that transfers from parents to the respondents are passed onto the respondent's children with the

respondent serving as an "intermediary" in these transfers.

Conclusions

Sub-Saharan Africa provides an important and interesting context to investigate patterns of transfers and relationships between generations that is distinguished from other less developed regions through the conjunction of high poverty levels, high morbidity and mortality, and the world's highest HIV/AIDS prevalence. The relevance of these conditions for the well-being of generations is heightened by the absence of institutionalized formal systems that can protect individuals from the consequences of frequently occurring economic, social, environmental and health shocks. As a result, vertical and lateral family support networks are an integral aspect of families in this context that can importantly contribute to the well-being of individuals and that can ameliorate the impact of health or economic shocks or crises. Despite the increasing interest devoted to the well-being of families in the era of generalized HIV/AIDS epidemics and the mechanisms used to cope with the consequences of the epidemic[28], very few studies have investigated transfer behaviors and transfer patterns from a multigenerational perspective in SSA even though the latter are widespread and represent an essential element of support for family and kin members in daily life and in periods of needs. Instead, a large body of prior research has focused on remittances and living arrangements as a form of support, partly due to the paucity of detailed data on kin and transfers outside the immediate household.[29] Although the household provides the main unit for financial and non-financial transfers, most prior studies have not been able to account for the fact that the family economy extends beyond the household and includes exchanges with non-coresiding kin members, more distant relatives, friends and neighbors. Moreover, prior studies have not taken into account that intergenerational and kin relationships are multi-directional and that transfers occur in multiple form and currencies; specifically non-financial transfers can be given and received in different forms such as help with household activities, personal care, supervision of small children, etc. If this multi-directionality and multiplicity of transfers is not considered in the analyses, an incomplete and distorted representation of the intergenerational transfers in SSA emerges.

This study overcomes the limitations of existing analyses by using innovative data from rural Malawi that comprises detailed information on intergenerational transfer relationships across three generations extending beyond the immediate household and including information on diseased and non-coresiding family members. By focusing on the transfer relationships between the study participants, their elderly parents and their adult children aged 15 and above, we reflect the multi-directionality of flows and the multiplicity of transfers currencies (i.e., financial and non-financial transfers) and make several important contributions to the existing literature summarized and discuss below.

In our analyses, we address the fact that demographic factors such as fertility and mortality determine the age structure of the population and the availability of potential transfer partners, and thus influence the observed transfer behavior.[30] To reflect the role of these important demographic constraints on transfers, we estimated the age patterns of transfers and showed their flows conditional on having transfer partners available (e.g., parents being alive or having adult children) as well as unconditional, from a life-cycle perspective for the overall sample. Our results showed some important differences in these two approaches that are requisite for understanding the transfer behavior and patterns in rural Malawi. For instance, conditional on having alive par-

ents, financial transfers from the prime-aged respondents to their elderly parents do not follow a strong age pattern, despite the declining health of the elderly generation with age. From a life-cycle perspective, financial transfers from respondents to their parents are strongly age-patterned and decline substantially with respondent's age as a result of diminishing probability with age of having alive parents. We estimated a similarly large discrepancy between conditional and unconditional non-financial transfers from respondents to their adult children that is importantly related to life-cycle changes in family composition as resulting from fertility/childbearing and parental/child mortality.

Recognizing the limitations of our measurements of net transfer flows in SSA due to the difficulties of monetizing transfers, we present in this paper analyses for both gross and net financial/non-financial transfers between respondents and their parents as well as adult children. Our findings suggest that although there is an extensive and sometimes age-patterned exchange of non-financial help between generations, the average net non-financial transfers are relatively low and without strong age pattern, which suggest the presence of *mutual help* rather than substantial allocation of non-financial assistance across generations. In striking contrast to this finding, financial transfers are strongly age-patterned and the net financial transfers show a *strong allocation of financial resources* from the generation of prime-aged respondents to their elderly parents and their adult children. This latter finding questions the results of some existing studies that have suggested that the role of younger and especially elderly individuals in SSA for sustaining the family has dramatically increased in the era of the HIV epidemic since they are providing more transfers and resources to prime-aged adults who are mostly affected by the epidemic.[31] In particular, existing studies have often hypothesized that in households where prime-aged adults are affected by HIV/AIDS, younger and especially elderly individuals take upon more financial and non-financial responsibilities. However, by investigating the net transfers flows between respondents and their parents as well as children, our analyses point towards a situation where prime-aged adults are important net providers of financial resources to both adult children and parents in rural Malawi. A major characteristic of these families' relationships is therefore the allocation of financial resources from the middle generation to younger adults and the elderly. From this perspective of the responsibilities they carry within their families, prime-aged adults in SSA seem to be in the position of the "sandwich generations" in developed countries, which has been described as mid-life adults who care concurrently for dependent children and old parents.[32]

In addition to documenting these age patterns of transfers, we investigate in this paper how transfers depend on the health status of the providers (i.e., the working-age adults who bear the highest health and economic burden of the HIV epidemic) and the recipients (i.e., the respondent's adult children or elderly parents). A surprising finding in these analyses is that financial and non-financial net transfers—and the underlying gross transfers of giving and receiving—are not strongly associated with the health status of the respondents, their adult children and their elderly parents. Moreover, neither net transfers, nor the provision and receipt of transfers, is associated with the respondent's HIV+ status or perception of being infected with HIV. This latter result is particularly surprising since the HIV/AIDS epidemic has increased uncertainty among individuals about their current and future health status and their survival, and as a consequence, one would expect that the high risk disease environment prevailing in rural Malawi and other SSA contexts would have affected transfer motivations and behavior among family members. For example, Delavande and Kohler (2009) have shown that prime-aged adults in rural Malawi perceive their own mortality risks not only to be high, but higher than might be expected based on measured mortality rates, which may translate into overly pessimistic perceptions about future

life expectancy, earnings and consumption. The lack of a strong and systematic association of net and gross financial/non-financial transfers with the respondent's health status in our analyses is surprising in this context. It is possibly related to the fact that the study population—like similar populations in SSA—has been exposed to high mortality and high morbidity environment for a considerable period, also predating the HIV/AIDS epidemic, and that the culture, norms and expectations about transfers in a high risk disease environment have been established over a long term and have not (yet) been fundamentally altered by the AIDS epidemic.

While we did not set out in this paper to test the theories of intergenerational transfers in developing countries[33], our findings are nevertheless informative about the motivations of transfers in SSA contexts. For example, one robust finding from the multivariate analyses is the strong positive association between a respondent's net transfers to adult children with net transfers to parents. That is, controlling for current wealth and other socioeconomic and demographic characteristics, respondents who provide higher net transfers to their children are more likely to provide a substantial amount of financial help to their parents. Our results therefore suggest a pattern that is consistent with an interpretation that some unobserved factors—such as unobserved aspects of wealth, income, health or levels of altruism towards parents/children[34]—affect the respondent's provision of transfers to both parents and children, and this pattern is inconsistent with a notion that transfers from parents to the respondents are passed on to the respondent's children with the respondent serving as an "intermediary" in these transfers. Moreover, a surprising aspect of the transfers documented in the present analyses is that, while transfers with adult children are commonplace, only a relatively small number of adult children seems to be engaged in this exchange of transfers. For instance, respondents aged 40–60 years provide on average financial transfers to only one out of four living adult children during the two-year period prior to the survey, and they receive financial transfers from only two out of almost five children during this period. We do not know based on our data if the set of children engaged in these transfers changes over time or is relatively constant. Nevertheless, this relative concentration of transfers between respondents and few adult children during a two-year period at least raises concerns about the sustainability of transfer flows in case of a health deterioration or the death of the transfer partners. Future research will need to investigate if other adult children step into these transfer relationships in case of a death or health shock of the child (or one of the children) with whom the respondent is primarily engaged in transfer relations.

Notes

[1]See for instance Ben-Porath (1980), Hammel (2005), Kohler and Hammel (2001), Pollak (1985), Rosenzweig (1988), Rosenzweig and Stark (1989) and Watkins and Swidler (2007).

[2]See for instance Ben-Porath (1980), Frankenberg et al. (2002) and Pörtner (2001).

[3]See for instance Bianchi et al. (2008), Billari and Liefbroer (2008), Hammel (2005), Knodel et al. (1992), Kohler and Hammel (2001), Merli and Palloni (2006), Palloni et al. (2010), Velkoff and Kowal (2006), Wachter et al. (2002) and Zagheni (2010).

[4]In contrast, extensive research has documented and analyzed the intergenerational relations in many developed countries that face rapid population aging; see for instance Lee and Mason (2011) or Silverstein and Giarrusso (2010).

[5]AIDS is currently the leading cause of adult mortality in many SSA countries (Blacker 2004, Bradshaw et al. 2003, Bradshow et al. 2004, Crampin et al. 2002, Heuveline 2003, 2004, Palloni 1996, Porter and Zaba 2004). At the turn of the century, the probability of a 15-year old dying before reaching age 60 was estimated to be in the range of 30–60% (Zaba et al. 2004). In 2003–2005, a time when the HIV/AIDS epidemic reached its maturity in most SSA countries, a study in the Karonga District in Northern Malawi estimated that 60% of men and 66% of women aged 15–44 years died as a result of HIV/AIDS (Hosegood et al. 2007, Jahn et al. 2005). In a different context, Wachter et al. (2002) simulated that despite low HIV prevalence of 2%, 13% of elderly Thais over age 50 will lose one adult child to AIDS, and 2% of them will lose multiple children. This impact is expected to be much higher in SSA (Zagheni 2010), where the estimated adult (aged 15-49) HIV+ prevalence ranges from 0.7 to 25.9 percent (UNAIDS 2009).

[6]See Bray (2009), Floyd et al. (2007), Hosegood and Timaeus (2006), Knodel et al. (2003), Merli and Palloni (2006), Mtika (2001), Naidu and Harris (2005), Nyasani et al. (2009), Peters et al. (2008) and Zimmer (2009).

[7]See Wachter et al. (2002) and Ankrah (1994).

[8](Cohen and Menken 2006, Heuveline 2004, Merli and Palloni 2006, Zaba et al. 2004)

[9](Bray 2009, Merli and Palloni 2006)

[10](e.g., Mtika 2003, Mtika and Doctor 2004, Weinreb 2002)

[11](Delavande and Kohler 2009)

[12]For example, in the context of investments in children's schooling, Grant (2008) has showed that women's real and perceived anticipation of future health shocks has a positive impact on their children's educational attainment.

[13](e.g., Wong et al. 1999)

[14]Although we acknowledge the importance of lateral familial ties and other supportive networks in the SSA context (Lee 2000), we focus our analysis on vertical intergenerational transfers that have received widespread attention in other contexts as a major source for pooling and transferring resources between generations (Knodel et al. 1992, Knodel and Saengtienchai 1999, Lee 2000, Mason and Miller 2000).

[15](e.g., Agree et al. 2002, Stecklov 1999)

[16]Detailed descriptions of the MLSFH sample selection, data collection, and data quality are provided on the project website http://www.malawi.pop.upenn.edu, in a Special Collection of the online journal *Demographic Research* that is devoted to the MLSFH (Watkins et al. 2003), and in a recent follow-up publication that incorporates the 2004 and 2006 MLSFH data (Anglewicz et al. 2009). Comparisons with the Malawi Demographic and Health Survey showed that the MLSFH sample population is reasonably representative of the rural Malawi population (Anglewicz et al. 2009, Bignami-Van Assche et al. 2003).

[17]For more detailed analyses of HIV/AIDS risk perceptions, see Anglewicz and Kohler (2009), Delavande and Kohler (2009), and Delavande and Kohler (forthcoming).

[18]The average 2004 HIV prevalence was about 9% in the MLSFH study population, with considerable regional variation: 2006 HIV prevalence among MLSFH respondents was 6.6% in Rumphi, 7.7% in Mchinji and 12.6% in Balaka (Obare et al. 2009).

[19]The sixth survey wave has been collected in summer 2010, but the data are not available for analyses at the time of this writing.

[20]Because we are interested in reciprocal transfers among parents and adult children and very few respondents below age 30 have children older than 15 years, we focus here on respondents 30 to 60 years old.

[21]The same fitting procedure is used throughout this paper.

[22]As an indicator for the data quality of the listing of children in the household/family roster, we also show in Figure 1 the mean number of alive children with unknown age that is fairly small and constant by age of respondents.

[23]Conditional on the mother being alive, the probability of female respondents aged 30+ co-residing with the mother is relatively constant around 35%.

[24]There are marked regional differences in the probability of co-residing with the mother or father due to differential marriage patterns. In the southern region (Balaka), where marriage is matrilineal, co-residence of female respondents

with their mother is more common, and coresidence with the father is less common, than in the central and norther region where marriage patterns are mixed or patrilineal. For example, conditional on the mother being alive, 61% of female respondents aged 30+ co-reside in the same household or compound with their mother in Balaka (southern region), while this is the case for only 28% of female respondents in Mchinji (central region) and 10% in Rumphi (northern region). For male respondents age 30+, the corresponding probabilities of co-residing with the mother are 17% (Balaka), 48% (Mchinji) and 58% (Rumphi). The analogous regional pattern exists for fathers and for male respondents.

[25]As long as the transfers *to* and *from* a particular parent are comparable, it is not problematic for this calculation of net transfers if "a lot of financial assistance" describes different amounts of transfers between the respondent and his/her mother and the respondent and his/her father.

[26]The underlying gross transfer patterns of receiving or providing a substantial amount of financial/non-financial transfers to parents are reported in Appendix Tables A.1–A.4.

[27]The dependent variable in the regressions in the Appendix Tables A.5–A.8 is the number of adult living children (ALC) to whom the respondent has given to or received from a substantial amount of financial/non-financial transfers.

[28](Ainsworth et al. 2000, Ankrah 1994, Chimwaza and Watkins 2004, Cohen and Menken 2006, Heuveline 2004, Kalemli-Ozcan 2006, Mushati et al. 2003, Ngalula et al. 2002, Nyanguru et al. 1994, van de Ruit and Vandemoortele 2005, Watkins 2004, Williams and Tumwekwase 1999, Young 2005, Zaba et al. 2004)

[29](Davies 2007)

[30](See for instance Henretta et al. 2001, Wolf 1994)

[31](Aboderin and Ferreira 2008, Bray 2009, Cheng and Siankam 2009, Foster 2000, Nyasani et al. 2009, Sagner and Mtati 1999, Schatz and Ogunmefun 2007)

[32](Bengtson 2001, Grundy and Henretta 2006)

[33](see for instance Becker and Tomes 1976, Frankenberg et al. 2002, Lillard and Willis 1997, Willis 1980)

[34](Becker 1974, 1991, Grundy and Henretta 2006)

Table A.1: Pooled analyses: logistic regression for providing substantial amount of financial transfers to parent (odds ratios)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
M5t1lots										
Respondent schooling										
Primary schooling	1.210	1.044	1.087	1.066	1.081	1.103	1.041	1.037	1.043	1.039
	(0.166)	(0.148)	(0.170)	(0.153)	(0.175)	(0.180)	(0.147)	(0.148)	(0.148)	(0.148)
Secondary schooling or more	1.420^{+}	1.060	1.126	1.105	1.233	1.316	1.049	1.055	1.053	1.060
	(0.257)	(0.203)	(0.237)	(0.214)	(0.272)	(0.295)	(0.203)	(0.204)	(0.204)	(0.205)
Respondent's wealth quintile		1.241**	1.216**	1.236**	1.187**	1.172**	1.243**	1.235**	1.241**	1.233**
		(0.044)	(0.047)	(0.044)	(0.048)	(0.048)	(0.044)	(0.044)	(0.044)	(0.044)
Respondent is HIV+			0.908							
			(0.180)							
Respondent's subj. likelihood of HIV infection†				1.010						
				(0.048)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					0.944	0.942				
					(0.104)	(0.105)				
Resp. is in excellent health					0.947	0.939				
					(0.133)	(0.133)				
Parent is in very poor/poor/good health						1.095				
						(0.118)				
Parent is in excellent health						0.976				
						(0.139)				
Respondent's children										
# of young living children							0.997	0.997	0.996	0.996
							(0.031)	(0.031)	(0.031)	(0.031)
# of adult living children							0.972	0.944	0.973	0.945
							(0.036)	(0.038)	(0.035)	(0.038)
Total net transfers to parents										
net financial transfer								1.167**		1.176**
								(0.067)		(0.067)
net non-financial transfer									0.860	0.837^{+}
									(0.082)	(0.082)
Observations	3334	3247	2820	3186	2530	2470	3247	3247	3247	3247

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent (mother/father) being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.2: Pooled analyses: logistic regression for providing substantial amount of non-financial transfers to parent (odds ratios)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
M5t3lots										
Respondent schooling										
Primary schooling	0.968	0.932	0.890	0.894	0.934	0.896	0.918	0.918	0.920	0.920
	(0.147)	(0.146)	(0.151)	(0.141)	(0.162)	(0.158)	(0.144)	(0.144)	(0.145)	(0.144)
Secondary schooling or more	0.922	0.855	0.913	0.829	0.778	0.762	0.800	0.800	0.806	0.806
	(0.202)	(0.198)	(0.234)	(0.194)	(0.214)	(0.213)	(0.185)	(0.185)	(0.187)	(0.187)
Respondent's wealth quintile		1.073	1.065	1.091*	1.108*	1.093^{+}	1.077^{+}	1.077^{+}	1.074^{+}	1.074^{+}
		(0.046)	(0.048)	(0.047)	(0.054)	(0.054)	(0.046)	(0.046)	(0.046)	(0.046)
Respondent is HIV+			0.909							
			(0.216)							
Respondent's subj. likelihood of HIV infection†				1.115*						
				(0.062)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					1.071	1.068				
					(0.147)	(0.149)				
Resp. is in excellent health					0.931	0.919				
					(0.161)	(0.161)				
Parent is in very poor/poor/good health						1.110				
						(0.144)				
Parent is in excellent health						1.657**				
						(0.277)				
Respondent's children										
# of young living children							0.940	0.940	0.939	0.939
							(0.037)	(0.037)	(0.037)	(0.037)
# of adult living children							0.925	0.926	0.920^{+}	0.920
							(0.045)	(0.046)	(0.046)	(0.047)
Total net transfers to parents										
net financial transfer								0.995		0.998
								(0.063)		(0.063)
net non-financial transfer									0.774^{+}	0.774^{+}
									(0.115)	(0.115)
Observations	3101	3022	2608	2965	2349	2289	3022	3022	3022	3022

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.3: Pooled analyses: logistic regression for receiving substantial amount of financial transfers from parent (odds ratios)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
M5t6lots										
Respondent schooling										
Primary schooling	1.326^{+}	1.318	1.383^{+}	1.303	1.317	1.324	1.288	1.290	1.288	1.290
	(0.219)	(0.225)	(0.263)	(0.224)	(0.252)	(0.262)	(0.220)	(0.220)	(0.220)	(0.220)
Secondary schooling or more	2.503**	2.392**	2.547**	2.334**	2.388**	2.396**	2.125**	2.126**	2.123**	2.124**
	(0.497)	(0.499)	(0.593)	(0.491)	(0.583)	(0.598)	(0.445)	(0.445)	(0.444)	(0.445)
Respondent's wealth quintile		1.013	1.025	1.009	1.021	1.018	1.015	1.015	1.015	1.016
		(0.039)	(0.043)	(0.040)	(0.046)	(0.047)	(0.039)	(0.039)	(0.039)	(0.039)
Respondent is HIV+			0.878							
			(0.210)							
Respondent's subj. likelihood of HIV infection†				1.010						
				(0.057)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					0.802^{+}	0.840				
					(0.101)	(0.107)				
Resp. is in excellent health					0.738^{+}	0.750^{+}				
					(0.117)	(0.119)				
Parent is in very poor/poor/good health						0.813^{+}				
						(0.096)				
Parent is in excellent health						0.985				
						(0.152)				
Respondent's children										
# of young living children							0.851**	0.851**	0.852**	0.852**
							(0.035)	(0.035)	(0.035)	(0.035)
# of adult living children							0.909	0.911	0.908	0.911
							(0.057)	(0.057)	(0.056)	(0.057)
Total net transfers to parents										
net financial transfer								0.986		0.984
								(0.073)		(0.073)
net non-financial transfer									1.088	1.090
									(0.257)	(0.259)
Observations	3326	3239	2812	3178	2523	2463	3239	3239	3239	3239

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.4: Pooled analyses: logistic regression for receiving substantial amount of non-financial transfers from parent (odds ratios)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
M5t8lots										
Respondent schooling										
Primary schooling	0.962	0.936	1.057	0.920	0.934	0.893	0.926	0.926	0.926	0.925
	(0.181)	(0.182)	(0.231)	(0.181)	(0.202)	(0.197)	(0.181)	(0.181)	(0.181)	(0.181)
Secondary schooling or more	0.831	0.788	0.967	0.774	0.813	0.783	0.759	0.760	0.760	0.761
	(0.218)	(0.216)	(0.300)	(0.215)	(0.260)	(0.255)	(0.212)	(0.212)	(0.213)	(0.213)
Respondent's wealth quintile		1.037	1.046	1.046	1.059	1.050	1.039	1.038	1.038	1.037
		(0.051)	(0.055)	(0.052)	(0.059)	(0.060)	(0.051)	(0.051)	(0.051)	(0.051)
Respondent is HIV+			0.748							
			(0.210)							
Respondent's subj. likelihood of HIV infection†				1.016						
				(0.069)						
Respondent's and parent's subjective health										
Resp. is in very poor/poor/good health					1.268	1.283				
					(0.200)	(0.204)				
Resp. is in excellent health					0.915	0.897				
					(0.185)	(0.182)				
Parent is in very poor/poor/good health						0.911				
						(0.138)				
Parent is in excellent health						1.826**				
						(0.336)				
Respondent's children										
# of young living children							0.960	0.959	0.959	0.958
							(0.044)	(0.044)	(0.044)	(0.044)
# of adult living children							0.965	0.960	0.962	0.957
							(0.073)	(0.071)	(0.078)	(0.075)
Total net transfers to parents										
net financial transfer								1.031		1.032
								(0.084)		(0.084)
net non-financial transfer									0.878	0.878
									(0.221)	(0.218)
Observations	3165	3083	2664	3023	2401	2341	3083	3083	3083	3083

Robust standard errors in parentheses. Standard errors are adjusted for clustering within respondents. p-values: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2, coresidence of parent, and region (3 regions). These coefficients are allowed to vary by gender of the respondent and gender of the parent. Analyses are conditional on parent being alive.
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only children who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.5: Pooled respondents: regression for the number of adult living children (ALC) to whom the respondent provides financial transfers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	0.162^{+}	0.040	0.054	0.022	0.072	0.069	0.054	0.019	0.006	0.032
	(0.084)	(0.084)	(0.091)	(0.085)	(0.093)	(0.093)	(0.083)	(0.083)	(0.083)	(0.091)
Secondary schooling or more	0.165	-0.032	0.021	-0.005	-0.019	-0.026	0.008	-0.072	-0.064	-0.055
	(0.190)	(0.190)	(0.208)	(0.192)	(0.215)	(0.216)	(0.190)	(0.191)	(0.194)	(0.216)
# of adult living sons	0.326**	0.306**	0.311**	0.306**	0.318**	0.297**	0.359**	0.317**	0.366**	0.380**
	(0.034)	(0.034)	(0.037)	(0.035)	(0.039)	(0.044)	(0.037)	(0.033)	(0.037)	(0.046)
# of adult living daughters	0.283**	0.260**	0.261**	0.266**	0.270**	0.242**	0.331**	0.271**	0.342**	0.357**
	(0.033)	(0.031)	(0.034)	(0.032)	(0.036)	(0.042)	(0.038)	(0.031)	(0.039)	(0.048)
Mean age of adult living children (ALC)	-0.026**	-0.029**	-0.028**	-0.029**	-0.030**	-0.030**	-0.027**	-0.029**	-0.028**	-0.030**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)
# of alive young children	-0.010	-0.014	-0.003	-0.013	-0.010	-0.012	-0.013	-0.018	-0.013	-0.007
	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)	(0.021)	(0.019)	(0.020)	(0.020)	(0.021)
Respondent's wealth quintile		0.178**	0.162**	0.177**	0.158**	0.157**	0.177**	0.180**	0.156**	0.140**
		(0.025)	(0.026)	(0.026)	(0.028)	(0.028)	(0.025)	(0.026)	(0.027)	(0.028)
Respondent is HIV+			0.080							
			(0.122)							
Respondent's subj. likelihood of HIV infection†				0.048						
				(0.034)						
Resp. is in very poor/poor/good health					-0.005	-0.012				-0.013
					(0.078)	(0.078)				(0.079)
Resp. is in excellent health					0.144	0.149				0.097
					(0.115)	(0.114)				(0.114)
# of ALC who are in very poor/poor/good health						0.066				0.060
						(0.049)				(0.049)
# of ALC who are in excellent health						0.017				-0.003
						(0.039)				(0.038)
# of non-coresident ALC							-0.104**		-0.092*	-0.127**
							(0.037)		(0.038)	(0.040)
# of parents who are alive								0.060	-0.023	-0.036
								(0.044)	(0.047)	(0.051)
Total net transfers to parents										
net financial transfer									0.354**	0.387**
									(0.060)	(0.063)
net non-financial transfer									-0.101	-0.114
									(0.073)	(0.078)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.6: Pooled respondents: regression for the number of adult living children (ALC) to whom the respondent provides non-financial transfers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	-0.022	-0.021	-0.062	-0.024	-0.010	-0.013	-0.013	-0.038	-0.005	0.011
	(0.063)	(0.064)	(0.071)	(0.065)	(0.076)	(0.076)	(0.063)	(0.063)	(0.064)	(0.075)
Secondary schooling or more	0.050	0.062	-0.071	0.070	-0.060	-0.064	0.083	0.043	0.126	0.013
	(0.134)	(0.136)	(0.141)	(0.139)	(0.150)	(0.154)	(0.135)	(0.138)	(0.147)	(0.169)
# of adult living sons	0.130**	0.136**	0.118**	0.139**	0.125**	0.091**	0.163**	0.142**	0.163**	0.134**
	(0.033)	(0.034)	(0.034)	(0.034)	(0.036)	(0.034)	(0.036)	(0.034)	(0.037)	(0.040)
# of adult living daughters	0.107**	0.112**	0.101**	0.113**	0.093**	0.057*	0.150**	0.114**	0.137**	0.105**
	(0.022)	(0.022)	(0.023)	(0.023)	(0.024)	(0.029)	(0.031)	(0.022)	(0.033)	(0.038)
Mean age of adult living children (ALC)	-0.002	-0.004	-0.004	-0.004	-0.002	-0.002	-0.003	-0.003	-0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
# of alive young children	0.005	0.006	-0.004	0.005	-0.006	-0.009	0.007	0.005	0.010	-0.005
	(0.015)	(0.015)	(0.015)	(0.015)	(0.017)	(0.016)	(0.015)	(0.015)	(0.016)	(0.017)
Respondent's wealth quintile		-0.009	-0.001	-0.007	0.007	0.006	-0.010	-0.013	-0.011	0.002
		(0.018)	(0.019)	(0.019)	(0.020)	(0.020)	(0.018)	(0.018)	(0.019)	(0.021)
Respondent is HIV+			0.000							
			(0.098)							
Respondent's subj. likelihood of HIV infection†				-0.020						
				(0.028)						
Resp. is in very poor/poor/good health					-0.089	-0.081				-0.087
					(0.057)	(0.056)				(0.057)
Resp. is in excellent health					-0.033	-0.031				-0.029
					(0.095)	(0.094)				(0.097)
# of ALC who are in very poor/poor/good health						0.047				0.028
						(0.033)				(0.034)
# of ALC who are in excellent health						0.066*				0.052+
						(0.030)				(0.031)
# of non-coresident ALC							-0.055+		-0.042	-0.063*
							(0.032)		(0.033)	(0.031)
# of parents who are alive								0.029	0.019	0.009
								(0.035)	(0.042)	(0.046)
Total net transfers to parents										
net financial transfer									-0.023	0.015
									(0.046)	(0.045)
net non-financial transfer									0.144+	0.097
									(0.086)	(0.091)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.7: Pooled respondents: regression for the number of adult living children (ALC) from whom the respondent receives financial transfers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	0.008	-0.002	0.017	-0.007	-0.006	-0.003	-0.023	0.002	-0.037	-0.045
	(0.081)	(0.083)	(0.088)	(0.084)	(0.092)	(0.092)	(0.082)	(0.082)	(0.084)	(0.094)
Secondary schooling or more	0.166	0.178	0.135	0.217	0.061	0.065	0.120	0.188	0.151	0.025
	(0.166)	(0.167)	(0.158)	(0.170)	(0.165)	(0.166)	(0.167)	(0.170)	(0.180)	(0.184)
# of adult living sons	0.309**	0.308**	0.304**	0.300**	0.303**	0.323**	0.231**	0.287**	0.225**	0.252**
	(0.037)	(0.037)	(0.040)	(0.038)	(0.043)	(0.052)	(0.038)	(0.036)	(0.038)	(0.052)
# of adult living daughters	0.268**	0.262**	0.244**	0.267**	0.232**	0.255**	0.159**	0.252**	0.172**	0.171**
	(0.032)	(0.031)	(0.032)	(0.031)	(0.032)	(0.041)	(0.034)	(0.030)	(0.035)	(0.042)
Mean age of adult living children (ALC)	0.027**	0.028**	0.025**	0.029**	0.022**	0.022**	0.025**	0.026**	0.024**	0.019**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
# of alive young children	-0.037*	-0.032+	-0.027	-0.031	-0.027	-0.025	-0.033+	-0.028	-0.030	-0.026
	(0.019)	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Respondent's wealth quintile		-0.002	-0.023	-0.006	-0.013	-0.012	-0.001	0.003	-0.006	-0.017
		(0.024)	(0.025)	(0.025)	(0.026)	(0.026)	(0.024)	(0.025)	(0.026)	(0.027)
Respondent is HIV+			-0.024							
			(0.113)							
Respondent's subj. likelihood of HIV infection†				0.040						
				(0.032)						
Resp. is in very poor/poor/good health					0.040	0.041				-0.008
					(0.072)	(0.072)				(0.076)
Resp. is in excellent health					-0.024	-0.027				0.022
					(0.094)	(0.094)				(0.095)
# of ALC who are in very poor/poor/good health						-0.045				-0.045
						(0.045)				(0.045)
# of ALC who are in excellent health						-0.026				-0.022
						(0.039)				(0.039)
# of non-coresident ALC							0.150**		0.138**	0.112**
							(0.036)		(0.035)	(0.038)
# of parents who are alive								-0.046	-0.083+	-0.075
								(0.042)	(0.045)	(0.049)
Total net transfers to parents										
net financial transfer									0.131*	0.094
									(0.054)	(0.059)
net non-financial transfer									0.038	0.063
									(0.066)	(0.070)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

Table A.8: Pooled respondents: regression for the number of adult living children (ALC) from whom the respondent receives non-financial transfers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Respondent schooling										
Primary schooling	-0.005	0.004	-0.021	-0.000	0.018	0.015	0.009	0.001	0.039	0.039
	(0.068)	(0.071)	(0.077)	(0.072)	(0.082)	(0.082)	(0.071)	(0.071)	(0.072)	(0.082)
Secondary schooling or more	-0.138	-0.114	-0.216^{+}	-0.107	-0.184	-0.186	-0.099	-0.123	-0.058	-0.152
	(0.112)	(0.117)	(0.129)	(0.119)	(0.134)	(0.136)	(0.117)	(0.119)	(0.124)	(0.145)
# of adult living sons	0.114**	0.122**	0.145**	0.123**	0.153**	0.120**	0.141**	0.123**	0.147**	0.139**
	(0.026)	(0.026)	(0.029)	(0.027)	(0.031)	(0.032)	(0.030)	(0.027)	(0.031)	(0.036)
# of adult living daughters	0.166**	0.174**	0.164**	0.175**	0.132**	0.099**	0.199**	0.177**	0.208**	0.123**
	(0.028)	(0.029)	(0.032)	(0.030)	(0.027)	(0.029)	(0.035)	(0.030)	(0.037)	(0.040)
Mean age of adult living children (ALC)	0.002	0.001	0.001	0.001	-0.001	-0.001	0.002	0.002	0.004	0.001
	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)
# of alive young children	0.010	0.012	0.006	0.011	0.007	0.004	0.012	0.011	0.017	0.011
	(0.015)	(0.016)	(0.017)	(0.016)	(0.018)	(0.018)	(0.016)	(0.016)	(0.016)	(0.019)
Respondent's wealth quintile		-0.019	-0.015	-0.017	-0.001	-0.003	-0.019	-0.021	-0.022	-0.004
		(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)
Respondent is HIV+			-0.017							
			(0.092)							
Respondent's subj. likelihood of HIV infection†				-0.034						
				(0.027)						
Resp. is in very poor/poor/good health					-0.080	-0.067				-0.076
					(0.061)	(0.060)				(0.063)
Resp. is in excellent health					-0.073	-0.073				-0.056
					(0.091)	(0.090)				(0.094)
# of ALC who are in very poor/poor/good health						0.027				0.019
						(0.032)				(0.034)
# of ALC who are in excellent health						0.075**				0.073**
						(0.027)				(0.027)
# of non-coresident ALC							-0.037		-0.044	-0.036
							(0.029)		(0.031)	(0.036)
# of parents who are alive								0.055	0.034	0.034
								(0.035)	(0.040)	(0.043)
Total net transfers to parents										
net financial transfer									0.029	0.021
									(0.045)	(0.047)
net non-financial transfer									0.177*	0.175*
									(0.078)	(0.082)
Observations	1472	1439	1248	1409	1145	1145	1439	1404	1326	1056

Standard errors in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.
Analyses additionally control for respondent age, age^2 and region (3 regions), and are conditional on the respondent having at least one adult living child (ALC).
†Coded as 0 = no likelihood, 1 = some likelihood, 2 = medium likelihood, and 3 = high likelihood.
‡Only parents who were given or provided *substantial amount* of financial/non-financial transfers.

References

Aboderin, I. and M. Ferreira. 2008. "Linking ageing to development agendas in sub-Saharan Africa: Challenges and approaches," *Journal of Population Ageing* 1(1): 51–73.

Agree, E. M., A. E. Biddlecom, M.-C. Chang and A. E. Perez. 2002. "Transfers from older parents to their adult children in taiwan and the philippines," *Journal of Cross-Cultural Gerontology* 17: 269–294. URL http://dx.doi.org/10.1023/A:1023085818629, 10.1023/A:1023085818629.

Ainsworth, M., K. Beegle and G. Koda. 2000. "The impact of adult mortality on primary school enrollment in Northeast Tanzania," *Journal of Development Studies* 41(3): 412–439.

Anglewicz, P., J. Adams, F. Onyango, S. Watkins and H.-P. Kohler. 2009. "The Malawi Diffusion and Ideational Change Project 2004–06: Data collection, data quality, and analysis of attrition," *Demographic Research* 20(21): 503.

Anglewicz, P. and H.-P. Kohler. 2009. "Overestimating HIV infection: The construction and accuracy of subjective probabilities of HIV infection in rural Malawi," *Demographic Research* 20(6): 65–96.

Ankrah, E. M. 1994. "The impact of HIV/AIDS on the family and other significant relationships: The African clan revisited," in R. Bor and J. Elford (eds.), *The Family and HIV*. Cassel, pp. 23–44.

Becker, G. 1974. "A theory of social interactions," *Journal of Political Economy* 82(6): 1063–93.

———. 1991. *A Treatise on the Family*. Harvard University Press.

Becker, G. and N. Tomes. 1976. "Child endowments and the quantity and quality of children," *Journal of Political Economy* 84(4): 143–162. URL URL:http://www.jstor.org/stable/1831106.

Ben-Porath, Y. 1980. "The F-connection: Families, friends and firms in the organization of exchange," *Population and Development Review* 6(1): 1–30.

Bengtson, V. 2001. "Beyond the nuclear family: The increasing importance of multigenerational bonds," *Journal of Marriage and Family* 63(1): 1–16.

Bianchi, S. M., J. V. Hotz, K. McGarry and J. A. Seltzer. 2008. "Intergenerational ties: Theories, trends and challenges," in A. Booth, A. C. Crouter, S. M. Bianchi and J. A. Seltzer (eds.), *Intergenerational Caregiving*. Washington D.C.: The Urban Instititute Press, chapter 1, pp. 3–43.

Bignami-Van Assche, S., G. Reniers and A. A. Weinreb. 2003. "An assessment of the KDICP and MDICP data quality: Interviewer effects, question reliability and sample attrition," *Demographic Research* Special Collection 1(2): 31–76. URL http://www.demographic-research.org.

Billari, F. C. and A. C. Liefbroer. 2008. "Intergenerational ties: What can be gained from an international perspective?" in A. Booth, A. C. Crouter, S. M. Bianchi and J. A. Seltzer (eds.), *Intergenerational Caregiving*. Washington D.C.: The Urban Instititute Press, pp. 53–66.

Blacker, J. 2004. "The impact of AIDS on adult mortality: evidence from national and regional statistics," *Aids* 18: S19.

Bradshaw, D., P. Groenewald, R. Laubscher, N. Nannan, B. Nojilana, R. Norman, D. Pieterse, M. Schneider, D. Bourne, I. Timæus et al. 2003. "Initial burden of disease estimates for South Africa, 2000," *South African Medical Journal* 93(9): 682–688.

Bradshow, D., R. Laubscher, R. Dorrington and I. M. Timaeus. 2004. "Unabated rise in number of adult deaths in South Africa," *South African Medical Journal* 94(4): 278–279.

Bray, R. 2009. "How does aids illness affect women's residential decisions? Findings from an ethnographic study in a Cape Town township," *Ajar-African Journal of Aids Research* 8(2): 167–179.

Cheng, S. T. and B. Siankam. 2009. "The impacts of the hiv/aids pandemic and socioeconomic development on the living arrangements of older persons in sub-saharan africa: A country-

level analysis," *American Journal of Community Psychology* 44(1-2): 136–147. Cheng, Sheung-Tak Siankam, Benjamin.

Chimwaza, A. and S. Watkins. 2004. "Giving care to people with symptoms of AIDS in rural sub-Saharan Africa," *Aids Care* 16(7): 795–807.

Cohen, B. and J. Menken. 2006. *Aging in Sub-Saharan Africa: Recommendations for furthering research*. National Academies Press. URL http://www.nap.edu/catalog.php?record_id=11708.

Crampin, A., S. Floyd, J. Glynn, F. Sibande, D. Mulawa, A. Nyondo, P. Broadbent, L. Bliss, B. Ngwira and P. Fine. 2002. "Long-term follow-up of HIV-positive and HIV-negative individuals in rural Malawi," *Aids* 16(11): 1545.

Davies, S. 2007. "Remittances as insurance for idiosyncratic and covariate shocks in Malawi: The importance of distance and relationship," *MPRA Paper No. 4463* URL http://mpra.ub.uni-muenchen.de/4463/.

Delavande, A. and H.-P. Kohler. 2009. "Subjective expectations in the context of HIV/AIDS in Malawi," *Demographic Research* 20(31): 817–874.

———. forthcoming. "The impact of HIV testing on subjective expectations and risky behavior in Malawi," *Demography* .

Floyd, S., A. C. Crampin, J. R. Glynn, N. Madise, M. Mwenebabu, S. Mnkhondia, B. Ngwira, B. Zaba and P. E. M. Fine. 2007. "The social and economic impact of parental HIV on children in northern Malawi: Retrospective population-based cohort study," *Aids Care–Psychological and Socio-Medical Aspects of AIDS/HIV* 19(6): 781–790.

Foster, G. 2000. "The capacity of the extended family safety net for orphans in Africa," *Psychology, Health and Medicine* 5(1): 55–62.

Frankenberg, E., L. Lillard and R. Willis. 2002. "Patterns of intergenerational transfers in Southeast Asia," *Journal of Marriage and the Family* 64: 627–641.

Grant, M. J. 2008. "Children's school participation and HIV/AIDS in rural Malawi: The role of parental knowledge and perceptions," *Demographic Research* 19(45): 1603–1634. URL http://www.demographic-research.org.

Grundy, E. and J. Henretta. 2006. "Between elderly parents and adult children: a new look at the intergenerational care provided by the 'sandwich generation'," *Ageing and Society* 26(05): 707–722.

Hammel, E. A. 2005. "Chayanov revisited: A model for the economics of complex kin units," *PNAS—Proceedings of the National Academy of Sciences of the United States of America* 102(19): 7043–7046.

Henretta, J. C., E. Grundy and S. Harris. 2001. "Socioeconomic Differences in Having Living Parents and Children: A U.S.-British Comparison of Middle-Aged Women," *Jounral of Marriage and Family* 63: 852–867.

Heuveline, P. 2003. "HIV and population dynamics: A general model and maximum-likelihood standards for East Africa," *Demography* 40(2): 217–245.

———. 2004. "Impact of the HIV epidemic on population and household structure: The dynamics and evidence to date," *Aids* 18: S45–S53. Suppl. 2.

Hosegood, V., S. Floyd, M. Marston, C. Hill, N. McGrath, R. Isingo, A. Crampin and B. Zaba. 2007. "The effects of high HIV prevalence on orphanhood and living arrangements of children in Malawi, Tanzania, and South Africa," *Population studies* 61(3): 327.

Hosegood, V. and I. Timaeus. 2006. "HIV/AIDS and older people in South Africa," in B. Cohen and J. Menken (eds.), *Aging in Sub-Saharan Africa: Recommendations for furthering research*. National Academies Press, pp. 250–275.

Jahn, A., F. Mwaungulu, V. Msiska, A. Crampin, L. Kachiwanda, S. Kasimba, N. McGrath, P. Fine and B. Zaba. 2005. "What is the true death toll of AIDS in rural Malawi? Population Estimates from the Karonga Continuous Registration System". National AIDS Commission Annual Meeting Abstracts, Lilongwe, Malawi, April 2005.

Kalemli-Ozcan, S. 2006. "AIDS, reversal of the demographic transition and economic development: Evidence from Africa". NBER Working Paper No. W12181 Available at http://www.nber.org.

Knodel, J., N. Chayovan and S. Siriboon. 1992. "The impact of fertility decline on familial support for the elderly: An illustration from Thailand," *Population and Development Review* 18(1): 79–103.

Knodel, J. and C. Saengtienchai. 1999. "Studying living arrangements of the elderly: Lessons from a quasi-qualitative case study approach in Thailand," *Journal of Cross-Cultural Gerontology* 14(3): 197–220.

Knodel, J., S. Watkins and M. VanLandingham. 2003. "AIDS and older persons: An international perspective," *JAIDS Journal of Acquired Immune Deficiency Syndromes* 33: S153.

Kohler, H.-P. and E. A. Hammel. 2001. "On the role of families and kinship networks in preindustrial agricultural societies: An analysis of the 1698 Slavonian census," *Journal of Population Economics* 14(1): 21–49. URL http://www.jstor.org/stable/20007748.

Lee, R. D. 2000. "Intergenerational transfers and the econbomic life cycle: A cross-cultural perspective," in A. Mason and G. Tapinos (eds.), *Sharing the Wealth: Demographic Change and Economic Transfers between Generations*. Oxford University Press, pp. 17–56.

Lee, R. D. and A. Mason. 2011. "Generational economics in a changing world," *Population and Development Review* 37: 115–142.

Lillard, L. A. and R. J. Willis. 1997. "Motives for intergenerational transfers: Evidence from Malaysia," *Demography* 34(1): 115–134.

Mason, A. and T. Miller. 2000. "Dynasties, intergenerational transfers, and life-cycle income: A case study of taiwan," in A. Mason and G. Tapinos (eds.), *Sharing the Wealth: Demographic Change and Economic Transfers between Generations*. Oxford University Press, pp. 57–84.

Merli, G. M. and A. Palloni. 2006. "The HIV/AIDS Epidemic, Kin Relations, Living Arrangements, and the African Elderly in South Africa," in B. Cohen and J. Menken (eds.), *Aging in Sub-Saharan Africa; Reccommendations for Furthering Research*. Washingon, D.C.: National Research Council, pp. 117–165.

Mtika, M. 2003. "Family transfers in a subsistence economy and under a high incidence of HIV/AIDS: the case of rural Malawi," *Journal of Contemporary African Studies* 21(1): 69–92.

Mtika, M. and H. Doctor. 2004. "Matriliny, Patriliny, and Wealth Flow Variations in Rural Malawi," *African Sociological Review/Revue Africaine de Sociologie* 6(2): 71.

Mtika, M. M. 2001. "The AIDS epidemic in Malawi and its threat to household food security," *Human Organization* 60(2): 178–188.

Mushati, P., S. Gregson, M. Mlilo, J. Lewis and C. Zvidzai. 2003. *Adult Mortality and the Economic Sustainability of Households in Towns, Estates and Villages in AIDS-Affected Eastern Zimbabwe*.

Naidu, V. and G. Harris. 2005. "The impact of HIV/AIDS morbidity and mortality on households—A review of household studies," *South African Journal of Economics* 73: 533–544. Sp. Iss. SI.

Ngalula, J., M. Urassa, G. Mwaluko, R. Isingo and J. Ties Boerma. 2002. "Health service use and household expenditure during terminal illness due to AIDS in rural Tanzania," *Tropical Medicine and International Health* 7(10): 873–877.

Nyanguru, A. C., J. Hampson, D. J. Adamchak and A. O. Wilson. 1994. "Family support for the

elderly in Zimbabwe," *Southern African Journal of Gerontology* 3(1): 32–36.

Nyasani, E., E. Sterberg and H. Smith. 2009. "Fostering children affected by AIDS in Richards Bay, South Africa: A qualitative study of grandparents' experiences," *Ajar-African Journal of Aids Research* 8(2): 181–192.

Obare, F., P. Fleming, P. Anglewicz, R. Thornton, F. Martinson, A. Kapatuka, M. Poulin, S. C. Watkins and H.-P. Kohler. 2009. "Acceptance of repeat population-based voluntary counseling and testing for HIV in rural Malawi," *Sexually Transmitted Infections* 85(2): 139–144.

Palloni, A. 1996. "Demography of HIV/AIDS," *Population Index* 62(4): 601–652.

Palloni, A., G. Pinto and R. Wong. 2010. "Family Support and Population Aging in Latin American and Carribbean". Paper presented at the Population Association Meetings, Dallas, April 15-17, 2010.

Peters, P., D. Kambewa and P. Walker. 2008. "The Effects of Increasing Rates of HIV/AIDS-related Illness and Death on Rural Families in Zomba District, Malawi: A Longitudinal Study". URL http://programs.ifpri.org/renewal/pdf/MalawiZomba.pdf, iFPRI Working Paper.

Pollak, R. 1985. "A transaction cost approach to families and households," *Journal of economic Literature* 23(2): 581–608.

Porter, K. and B. Zaba. 2004. "The empirical evidence for the impact of HIV on adult mortality in the developing world: data from serological studies," *Aids* 18: S9.

Pörtner, C. 2001. "Children as insurance," *Journal of Population Economics* 14: 119–136.

Raut, L. and L. Tran. 2005. "Parental human capital investment and old-age transfers from children: Is it a loan contract or reciprocity for Indonesian families?" *Journal of Development Economics* 77(2): 389–414. URL http://www.sciencedirect.com/science/article/B6VBV-4FY9MFS-1/2/2da442aba579c794e0c3ae38e9dbfecb.

Rosenzweig, M. R. 1988. "Risk, implicit contracts and the family in rural areas of low-income countries," *Economic Journal* 98: 1148–1170.

Rosenzweig, M. R. and O. Stark. 1989. "Consumption smoothing, migration, and marriage: Evidence from rural India," *Journal of Political Economy* 97(4): 905–926.

Sagner, A. and R. Z. Mtati. 1999. "Politics of pension sharing in urban south africa," *Ageing and Society* 19: 393–416. Part 4.

Schatz, E. and C. Ogunmefun. 2007. "Caring and contributing: The role of older women in rural south african multi-generational households in the hiv/aids era," *World Development* 35(8): 1390–1403. Schatz, Enid Ogunmefun, Catherine.

Silverstein, M. and R. Giarrusso. 2010. "Aging and family life: A decade review," *Journal of Marriage and Family* 72(5): 1039–1058.

Stecklov, G. 1999. "Evaluating the economic returns to childbearing in Côte dÊijIvoire," *Population Studies* 53(1): 1–17.

UNAIDS. 2009. *AIDS epidemic update December 2009*.

van de Ruit, C. and M. Vandemoortele. 2005. "Socio-economic consequences of AIDS: A qualitative study in rural Malawi". Unpublished working paper, University of Pennsylvania, Philadelphia, PA.

Velkoff, V. A. and P. R. Kowal. 2006. "Aging in Sub-Saharan Africa: The Changing Demography of the Region," in National Research Council (ed.), *Aging in Sub-Saharan Africa: Reccommendations for Furthering Research*. Washington, DC: The National Academies Press, pp. 55–91.

Wachter, K., J. Knodel and M. VanLandingham. 2002. "AIDS and the elderly of Thailand: Projecting familial impacts," *Demography* 39(1): 25–41.

Watkins, S. 2004. "Navigating the AIDS epidemic in rural Malawi," *Population and Development*

Review 30(4): 673–705.

Watkins, S., J. Behrman, H. Kohler and E. Zulu. 2003. "Introduction to" Research on Demographic Aspects of HIV/AIDS in Rural Africa"," *Demographic Research Special Collections* 1(1): 1–30.

Watkins, S. C. and A. Swidler. 2007. "Ties of dependence: Aids and transactional sex in rural malawi," *Studies in Family Planning* 38(3): 147–162.

Weinreb, A. 2002. "Lateral and vertical intergenerational exchange in rural Malawi," *Journal of cross-cultural gerontology* 17(2): 101–138.

Williams, A. and G. Tumwekwase. 1999. ""an elephant has to carry its tusks": Grandparent's efforts to educate their grandchildren in rural Uganda," in P. Thomas and S. Bissell (eds.), *Education for Sustainable Development*. Canberra: Development Studies Network and Australian National University, pp. 51–56.

Willis, R. 1980. "The old age security hypothesis and population growth," in T. Burch (ed.), *Demographic behavior: Interdisciplinary Perspectives on Decision-making*. Westview Press: Boulder, pp. 43–69.

Wolf, D. A. 1994. "Elderly and their kin: Patterns of availability and access," in L. Martin and S. Preston (eds.), *Demography of Aging*. Washington DC: National Academy Press, pp. 146–194.

Wong, R., K. Kitayama and B. J. Soldo. 1999. "Ethnic differences in time transfers from adult children to elderly parents: Unobserved heterogeneity across families," *Research on Aging, Special Issue on Multilevel Analysis in Aging Research* 21(2): 144–175.

Young, A. 2005. "The gift of the dying: The tragedy of AIDS and the welfare of future African generations," *Quarterly Journal of Economics* 120(2): 423–466.

Zaba, B., A. Whiteside and J. Boerma. 2004. "Demographic and socioeconomic impact of AIDS: Taking stock of the empirical evidence," *Aids* 18: S1.

Zagheni, E. 2010. "The effect of the HIV/AIDS epidemic on orphanhood and kinship structure in Zimbabwe: Results based on formal demography and microsimulation". .

Zimmer, Z. 2009. "Household composition among elders in Sub-Saharan Africa in the context of HIV/AIDS," *Journal of Marriage and the Family* 71(4): 1086–1099.