Orphans, Poverty and Human Capital in Sub-Saharan Africa

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ABSTRACT

SCOTT R. STEWART: Orphans, Poverty and Human Capital in Sub-Saharan Africa
(Under the direction of Sally Stearns and Sudhanshu Handa)

This dissertation research informs our understanding of the social cost of HIV/AIDS as it relates to children. Specifically, I examine orphan status and poverty as potential sources of vulnerability in the development of human capital, and alternative strategies to mitigate their effects. Deficits in human capital among children can lead to reduced productivity as adults, and human capital deficits may transmit intergenerationally; hence, human capital is an important aspect of the social cost of HIV/AIDS. Cash transfers are one form of intervention that may mitigate the social cost of AIDS. My analysis compares nutritional status and school enrolment, as measures of vulnerability, between orphans and non-orphans using OLS, fixed-effect and probit regressions. Micro-simulations are employed to compare the effects of alternative targeting strategies for cash transfer programs on consumption and school enrolment. The findings indicate that poverty is a more important source of vulnerability than orphan status and that targeting households with children explicitly offers greater benefits for the poorest children than targeting households that host elderly residents or households with labor constraints. Collectively, these findings suggest that presumptive targeting of orphans may not be warranted.

To my mother Donna Stewart,
who never hesitated to ask
"How far are you with that paper?"

and to my daughter Itumeleng Shadreck –
you challenge me, you encourage me,
and you make me smile.

Together, they have been a daunting pair.

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The studies presented herein utilize data from Demographic and Health Surveys (DHS) and Living Standards Measurement Surveys (LSMS) or their equivalent, from the countries of Kenya, Lesotho, Malawi, Mozambique, Tanzania, Uganda, and Zambia. Express appreciation is given to the governments of these countries, through their central statistics offices, for making the data available. I also wish to acknowledge the efforts of MEASURE-DHS and country UNICEF offices for their facilitation of access to the DHS and LSMS data, respectively.

Completion of this work was possible only with the shepherding and encouragement of Ashu Handa, who questioned me, argued with me, prompted me, and helped me to organize my thinking within a strategic framework. I am fortunate now to count Ashu as a friend. I am extremely appreciative of his family as well, who at various times have housed me, fed me, and generally teased and tolerated me.

Will Dow inspired me; Sally Stearns challenged me. I thank them both.

My thinking about children – particularly orphans – and HIV/AIDS has evolved over time, from presumptive concern to the more nuanced view presented by this work. The staff at UNICEF/ESARO in 2007 provided necessary insight, challenge, and opportunity to explore in that process. In particular, I thank Karen Allen, Doug Webb, and Yumiko Yokozeki for their patience and thoughtfulness.

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CHAPTER 1: INTRODUCTION

The overarching aim of this research is to assess the social costs of HIV/AIDS and the comparative effects of some efforts to mitigate it. AIDS is the number one cause of prime-age mortality in sub-Saharan Africa, and the region hosts approximately 25-30 million orphans, one third of whom have lost a parent to the disease. AIDS related prime-age adult mortality has led life expectancy rates to decline dramatically in the region and has severely weakened family support systems already stretched thin by extreme chronic poverty.

The dimension of social costs on which I focus is the potential human capital losses – deficits in health and education – that might be expected to be incurred by AIDS orphans and children made vulnerable by HIV/AIDS, and strategies to address them. These are important questions for the economic development of countries severely affected by HIV/AIDS because deficits in human capital among children can lead to reduced productivity as adults, and human capital deficits may transmit intergenerationally.

With this in mind, vulnerability and its implications for targeting provide the connective tissue for the three papers that follow. There are potential sources of vulnerability for children other than HIV/AIDS, e.g. poverty, absence from school, and insults to health. With all the attention and resources brought to bear on AIDS and orphans, an important question is whether it makes sense to target orphans because they are orphans, or to target children subject to broader sources of vulnerability.

Specifically, are orphans that much different from other children when other sources of vulnerability are considered? I find, in analysis of nutritional status, that orphans typically are not different from other children. Rather, household wealth is a stronger driver of nutritional status than orphan status.

I then turn to comparative analysis of alternative targeting strategies under two forms of cash transfers that currently are under debate – in part from the lens of benefits to orphans and vulnerable children (OVC). Cash transfers are small, predictable payments to households from government, financed by the general budget and/or donor funds. The first program considered is a targeted cash transfer program with a fixed budget, targeted in the sense that it attempts to direct resources to the poorest of the poor based on eligibility criteria. The second is a universal cash grant that would provide transfers to any eligible household regardless of wealth.

I find, using microsimulations and projection, that targeting households with children confers greater benefits on children. This may seem obvious, but some claimants in the current policy debate argue that OVC benefit substantially through programs that target households with labor constraints or households that host the elderly. The difference is in the denominator: they cite evidence that OVC comprise a large proportion of beneficiaries under alternative targeting strategies; I show that a large proportion of OVC would be missed because they do not reside in eligible households under these targeting strategies.

This research provides a contribution by using large-sample, nationally representative data from multiple countries to inform current policy debates. Until now, sample sizes employed to analyze the relationship between nutritional status and orphan hood have been much smaller, perhaps too small to detect a significant difference. Assessments of the welfare effects of cash transfer programs have been focused on small areas – the places in which they were piloted – but the potential benefits of national scale-up should be considered before a final determination is made.

Readers of this work are discouraged from over-interpreting the scope of its findings. The samples employed include OVC living in households. Human capital is treated as indicated by specific measures of health and education. Unconditional cash transfers – targeted or universal – are the only mechanism of assistance that is assessed.

As this research employs large-scale household surveys, and so provides a contribution to the literature and current policy debates, the data limit observations on OVC to those living in households. Other vulnerable children, whether orphaned or not, may be missed in the analysis, e.g. street children, child soldiers, or those living in informal child-headed households that may be rather fluid. Child advocates have highlighted the plight of OVC living outside of the types of households that typically would be sampled in national surveys. This research is unable to comment.

As often is stated, OVC may also live in households constituted only by elderly residents and children, the so-called “missing generation” households. These households lack prime-aged adults that might otherwise provide income to support OVC and, in result, have high dependency ratios. However, such households are observed with very little frequency in the data. Given the sampling frames and persistence required of data collection teams by survey protocols, there is little reason to assume that “missing generation” would systemically be omitted from the data. Their emphasis in the gray literature may instead be based on anecdotal evidence or small-area surveys.

It also is important to note that the direct comparison of orphans' and non-orphans' nutritional status in this research is limited to samples of children aged 0-59 months. Child-fostering is common in sub-Saharan Africa and it is plausible that younger orphans are more readily assimilated into households. If this is true, it would help to explain the difference between findings from my analysis of nutritional status, that there is no difference based on orphan status, and the general sense of the literature that differences do exist in education. Hence, this research informs but does not conclude the question whether orphans suffer human capital deficits, particularly since it finds no deficits in nutritional status.

A valid question that arises in the context of OVC policy discussions is whether orphan hood, and assumptions that orphans fare more poorly, is a Western construct that does not apply in the sub-Sahara African context. Indeed, children from a household that is a poor producer of health may be better off with fostering after their parent's death. Child-fostering is a longstanding, commonly held tradition in sub-Saharan Africa. Active fostering, i.e., placement of children in other households by their parents, may happen to promote the child's opportunities, to provide labor in the fostering household, or to alleviate the burden of care for biological parents. But it seems unlikely that fostered children with living parents – who may act as advocates – would fare more poorly than those without. Hence, the question whether children who may not have parent-advocates, orphans, is of interest. Further, I do not attempt to assess potential psycho-social effects of orphan hood that may arise from experiencing the death of a parent. In any case, Western nations largely finance programs that target assistance to children based on orphan status alone, or use benefits to orphans as an evaluation measure. Comparison of orphans and non-orphans is therefore appropriate in order to assess the relevance of policies.

CHAPTER II: NO WORSE THAN THEIR PEERS?
ORPHANS' NUTRITIONAL STATUS
IN FIVE EASTERN AND SOUTHERN AFRICAN COUNTRIES

Introduction

Sub-Saharan Africa is the only region globally in which orphan prevalence – the proportion of children aged 0-15 who have lost at least one parent – is expected to rise in coming years. The number of orphans in sub-Saharan Africa has been projected to increase to 42 million by 2010 from an estimated 35 million at the beginning of the decade, due largely to parental death from AIDS. Children's loss of a parent could inhibit their ability to develop the potential to lead productive lives as adults, particularly by limiting the investment available for health and education, the primary components of human capital. Children's nutritional status is a key determinant of future potential. Better nutrition in early childhood has been linked to higher cognitive development and schooling outcomes, which enhance productivity. Stunting in early childhood diminishes adult height, which is positively correlated with wages. Hence, poor nutrition in early childhood results in lower returns to education beyond the more direct impact of poor nutrition on overall school attainment.

Concern about lower schooling outcomes among orphans have resulted in policy decisions to direct resources to orphans, at times without regard to their socioeconomic status, on the assumption that orphans fare more poorly per se. There is increasing concern that such specific targeting results in a misallocation of resources because orphans' outcomes are related more closely to living arrangements,
which can affect orphans and non-orphans alike. If orphans fare more poorly because they are orphans, basing targeting criteria on orphan status would be appropriate. If,

however, orphans fare worse because their living arrangements confer constraints that also affect non-orphans, assistance should be targeted accordingly.

This research investigates whether orphans' existing living arrangements mediate relationships between orphan status and nutritional outcomes for children aged 0-59 months, using recent Demographic and Health Surveys (DHS) from five East and Southern African countries with moderate to high HIV prevalence. Current evidence regarding a relationship between orphan status and anthropometric measures is sparse and inconclusive. Few previous studies have identified relationships between nutritional outcomes and orphan status and none have emphasized the potential for living arrangements to moderate observed relationships. Studies of orphans' nutritional status from sub-Saharan Africa in particular are based on relatively small samples. The more recent DHS data employed for this study afford the advantages of increased sample size for nutritional comparisons as well as extensive measures of household demographics.

Two questions are emphasized in this study: whether differences in nutritional status between orphans and non-orphans are observable in larger samples that offer greater statistical power, and whether observed effects are moderated by kinship ties and other characteristics of the households in which orphans live. Both these questions add value to the current state of knowledge on nutritional disparities between orphans and non-orphans, which is largely based on small samples and does not consider living arrangements as a confounding factor in determining orphan nutritional status.

Why might orphans be nutritionally at risk?

Orphans may be observed to have lower nutritional status than non-orphans for several reasons. It is possible that orphans have lower health endowments than non-orphans. Generally, this would seem implausible since most premature adult mortality in sub-Saharan Africa occurs as a result of accident, infectious disease, or other exogenous reasons. Diminished health endowment would be expected, however, if the orphan's mother was HIV-positive at the time of birth and perinatal transmission occurred.

Orphans may also exhibit lower nutritional status because of nutritional challenges that occurred prior to the event of their becoming an orphan. Two possible reasons exist for this explanation. Household responses to an adult member's death could adversely affect the child. For example, if the deceased parent was chronically ill prior to death they may have been physically incapable of providing adequate care for the child. Similarly, household resources may have been diminished or diverted away from child feeding to provide care for the ill parent. Alternatively, household characteristics that are correlated with parental death may diminish the household's propensity to provide adequate care for children, for example through risk-taking behavior, health knowledge or resource allocation.

A child's nutritional status could also be compromised after becoming an orphan. This would occur if orphans are fostered by poorer households or, in the case of single orphans, they remain living with the surviving parent and household resources (time and money) are diminished due to the loss of a productive adult, i.e., the parent who is deceased. Another reason that orphans may suffer nutritional challenges in their current situation is if household resource allocation decisions disfavor orphans, because the household's returns to investment in the child are discounted or because of competition with natural children living in the same household.

If orphans have lower nutritional outcomes than their non-orphan peers, it would constitute a prima facie argument for policy intervention regardless of how the deficit occurred. Stunting is a very long-term effect of poor nutrition (WHO 1995; Cogill 2003), and because wages in adulthood may be associated with height (see e.g. Thomas & Strauss 1997) stunting could depress returns to education. Wasting may diminish long-term health (Behrman et al. 2004). Child nutrition generally has been linked to cognitive development, and deficits in all of these factors – stature, health, cognitive ability – have been linked to educational attainment and productivity in adulthood (Behrman et al. 2004; Grantham-McGregor et al. 2007). The causal pathway of nutritional status would be of importance, however, to decisions regarding how to target policy interventions if they are warranted.

Recent literature on health and living arrangements among orphans

Health and nutrition

The relationship between orphan status and children's nutritional status in sub-Saharan Africa has not been well established, and previous results regarding other health indicators are mixed. Three of four studies of orphan effects on anthropometrics generally found no effect. Two of the four were cross-sectional studies. Point estimates frequently were of conflicting sign and none of these were statistically significant (Ainsworth and Semali 2000; Lindblade et al. 2003; Crampin et al. 2003). The one exception within these studies was a finding based on cross-tabulations that the mean weight-for height z-score (WHZ) among orphans was 0.28 lower than that of non-orphans (Lindblade et al. 2003). Each of these studies used data from East and Southern African countries, with sample sizes ranging 1,106 to 1,190. Ainsworth and Semali

(2000) used a four-wave panel structure and still obtained only 2,679 observations from 1,108 children.

In contrast, Gertler et al. (2003), found that maternal death between 1993 and 1997 reduced the surviving child's WHZ by 0.7 standard deviations and increased the probability of wasting, i.e., falling below a Z-score of –2, during the period by 14 percentage points. Like Ainsworth and Semali (2000), Gertler et al. employ a child-level fixed effects model on two waves of data. Gertler's sample, from Indonesia, is much larger for the WHZ analysis at 7,848 observations, but roughly similar in the wasting analysis at 2,176 observations. Hence, it is unclear whether Gertler et al. obtained different results because of larger sample size or because of substantial difference between the African and Indonesian settings.

The morbidity impact of orphanhood has received very limited attention. In a study in Tanzania (Ainsworth and Semali 2000), the probability that a child was reported to be ill on the day of an interview increased by 16 percentage points if the child was a paternal orphan and by 27 percentage points if there had been an adult death within the household during the past six months. However, these results were fully attenuated if the household's structure had a floor made of materials other than dirt. While this latter indicator was intended to proxy for wealth, the authors note that having a dirt floor increases the likelihood that a child ingests dirt, so these results may be spurious. Lindblade et al. (2003) find no association between orphan hood with a number of biomarkers including fever, hemoglobin and malaria parasitemia, as well as children's history of diarrhea and respiratory illness in the two weeks prior to interview. Crampin et al. (2003) found no evidence of morbidity during follow-up.

Child mortality, on the other hand, demonstrates a consistent relationship with orphan status, although only two studies were identified that address the topic directly. Both studies find that maternal orphans have increased mortality risk and paternal orphans experience no effect (Crampin et al. 2003; Gertler 2003). Further, Crampin et al. find that while mortality risk from maternal death increases among children of HIV positive mothers, it does not for children of HIV negative mothers. However, generalization from this study is complex due to uncertainty regarding children's HIV status. A related study of child mortality finds that the survival of children born during the five years preceding their analysis was enhanced by the degree of biological relatedness to adults within the household (Bishai et al. 2003). While this last study focuses on household structure and not orphan status per se, it suggests that orphans' chances of survival improve when they are placed in households with greater numbers of closely related adults.

Orphans' living arrangements

African orphans typically are not institutionalized in orphanages; rather, orphan care is community-based through a traditional system of fostering within the extended family or by others. Although some documentation (Nyambedha et al. 2003) indicates that the traditional system will be overtaxed by the region's increasing orphan burden, policy makers discourage an institutional response because of concerns regarding quality of care, socialization back into the community, and costs (TvT Associates 2002).

Case et al. (2004) found that "many maternal and paternal orphans are 'virtual' double orphans," in the sense that their living arrangements do not include co-residence with the surviving parent. The range of point estimates for the East and Southern African

(ESA) countries in their sample indicates that roughly 69-90 percent of non-orphans in ESA countries lived with their mothers, while only 55-85 percent of paternal orphans did. Similarly, 44-75 percent of non-orphans lived with their fathers, but only 17-70 percent of maternal orphans did.

The literature characterizes living arrangements for double orphans more explicitly. Double orphans in ESA countries tend to live in households headed by a relative. Double orphans live in households headed by grandparents at rates of 26-55 percent, which is 2.5-3 times the rates at which non-orphans do (Bicego et al. 2003; Evans 2004), and in households headed by the orphan's sibling at roughly a quarter to half the rate they live with grandparents (Ainsworth and Filmer 2002; Evans 2004). Other relatives make up the difference (Nyambedha et al. 2003; Evans 2004).

Other characteristics of heads of households that host double orphans suggest potential vulnerability. On average, heads of households in which double orphans live have half a year less education than households with children who are not double orphans (Evans 2004a). Double orphans also are more likely to live in female-headed households and in households of which the head has no education, at rates of 36-52 percent and 32-45 percent (up to 2.3 and 2.5 times those for non-orphans), respectively (Bicego et al. 2003).

Household structure notwithstanding, household wealth among double orphans compares favorably to that of non-orphans (Bicego et al. 2003; Case et al. 2004; Evans 2004). Bicego et al. (2003) find that household wealth among double orphans is, on average, fairly similar to that of non-orphans. Pooling DHS data, Evans (2004) found that double orphans are slightly more likely than non-orphans to live in households with electricity, with roughly equivalent structure quality (as measured by floor material), but with lower likelihood of having a toilet or latrine. Averaging estimates across DHS, Case et al. (2004) find that double orphans fare better than other orphans in terms of durable goods available within the household.

Still, there is substantial variation in the wealth of households that host an orphan of any type. One study reports that poorer households tend to have higher concentrations of orphans (Ainsworth & Filmer 2002), but other evidence suggests a more nuanced picture, with household wealth being associated with orphan-type: Case et al. (2004) find that maternal orphans tend to live in households with wealth similar to that of households in which non-orphans live, but that paternal orphans live in households with lower wealth. Indeed, Case et al. conclude that the relatively poor household wealth associated with paternal orphans drives other findings that orphans generally live in poorer households.

Evans (2004) finds that households fostering double orphans have 1.5 fewer children of all ages and 0.12 fewer children of the orphan's gender and close to the orphan's age. Further, he finds no evidence of negative effects from fostering on other members of the household, having tested for differences in educational outcomes and anthropometric measures among both children and female adults. From this, the study determines that households fostering double orphans are not disadvantaged, citing the result that the estimated effect of fostering an orphan on other household members is less than that of a new child. This suggests that orphans consume less, produce more, or both, relative to a natural child in the households in which they were fostered.

Data, methods, variables and hypotheses

Data

This research exploits adjustments made to recent Demographic and Health Surveys (DHS) which permits collection of additional data on the nutritional status of orphans. The DHS make use of a multi-level questionnaire. Past DHS typically have collected anthropometric data through the individual woman's questionnaire and, hence, only for children living with their biological mothers. Recent changes in the DHS have elevated anthropometrics to the household questionnaire, such that those data are available for all children living in the household. Hence, the more recent DHS data employed for this study afford the advantages of increased sample size for nutritional analysis of orphans, as well as extensive measures of household demographics.

The study data are drawn from DHS in five sub-Saharan African countries with moderate to high HIV prevalence: Kenya 2003 (7% adult HIV prevalence), Lesotho 2004 (23%), Malawi 2004 (12%), Tanzania 2004 (7%), and Zambia 2002 (15%)[1]. Sample sizes from the four countries other than Lesotho range approximately 5,000 to 8,800 children aged 0-59 months. Lesotho's sample of 1,700 observations is much smaller, but this country was included because of the possibility that its high HIV prevalence could exacerbate any effects that may be present more broadly.

Variables

Nutritional status typically is proxied by measures of physical status, or anthropometrics. Anthropometric indices are measured as z-scores for height-for-age (HAZ), weight-for-age (WAZ), and weight-for-height (WHZ). A child's z-scores

[1] HIV prevalence for Tanzania is estimated from the 2003 AIDS Indicator Survey, a modified version of the DHS. All other adult HIV prevalence rates listed are estimated from the corresponding DHS samples.

measure departure from the mean of a standard reference population in units of the reference population's standard deviation. WHO has adopted reference curves from the U.S. National Center for Health Statistics as the international standard of comparison (WHO 1995). HAZ is generally interpreted as a measure of longer-term nutritional well-being; low HAZ indicates nutritional challenges over a long period of time. And HAZ scores below –2 are generally interpreted to indicate "stunting," which may cause permanent deficits in stature. WHZ is a more temporal measure of nutritional status. Low WHZ can result from temporary and thus more current nutritional challenges. WHZ below –2 generally indicate "wasting." Deficits in WAZ can result both from long-term and current nutritional challenges and are better interpreted in the context of the other two indices (WHO 1995). Populations in developing countries typically demonstrate low HAZ. Hence, z-score comparisons must be made within the population under study; absolute measures offer little information (WHO 1995).[2]

An orphan is any child with at least one deceased parent. Following Case et al. (2004), children with a parent whose survivorship was unknown also were treated as orphans, since that parent was unlikely to have provided any material or psycho-social support to the child. In the main analyses, orphan status is measured as part of a construct of child-type in accordance with whether the child lives in a blended household. A blended household is one in which both orphans and non-orphans live. A non-blended household has only orphans or only non-orphans. This yields four types of children:

[2] For age-specific anthropometric indices, age is measured in days. Observations with biologically implausible indices are identified according to WHO guidelines (WHO 1995) and eliminated through case-wise deletion.

orphans in blended household, orphans in non-blended households, non-orphans in blended households, and non-orphans in non-blended households.

Sex and age of the child are used as child-level control variables in all models. These controls are important to include. As demonstrated in Figure 1, the probability of being an orphan increases with age among children aged 0-14 years (panel A), and z-scores for anthropometric indices generally decrease with age (panel B). Omission of the age controls would then lead to an upward bias in estimates of the relationship between orphan status and under-nutrition. Age is specified as a construct of indicators for the child being of age 0-12 months, 13-24 months, and 25-59 months, allowing for variation in the relationship between age and anthropometrics.

Wealth is measured as quintiles of household wealth within each survey's entire distribution of households. Assignment to wealth quintiles is based on principal components analysis of a list of durable goods items available to responding households. Adult female education is a household characteristic that represents the amount of education available to the primary caretakers of children. It is measured as a continuous variable of years of education for the resident woman in the household above age 17 with the highest educational attainment. Other specifications were investigated, such as mean female education in the household, but these had little effect on the results.

A construct of three other household demographic measures offer a proxy for the time available for child tending. These include the number of women of reproductive age (15-49), the number of women aged 50-70, and the children below the age of 13 years. The two age groups for adult females were separated to allow flexibility in the intensity of time-inputs that members of each group would provide for child tending. Finally, two indicator variables are used for the children's relationship to household head, yielding three groups: child of the household head, grandchild, or other relative. The numbers of children living in other households, such as those headed by a sibling, were too small to be included in the analysis and were eliminated by case-wise deletion (e.g. ranging from one observation in Lesotho to twelve in Kenya).

Methods

Econometric methods are used to estimate the orphan 'effect' on nutritional status of children under 60 months of age in each of the 5 countries. In the baseline models, an OLS regression is used to estimate the relationship between a child's orphan status and their z-scores for height-for-age, weight-for-height, and weight-for-age controlling only for age and sex, as shown in equation (1).

$$Z_i = \alpha + \beta_1(orphan_i) + \beta_2(sex_i) + \beta_3(age_i) + \varepsilon_i \qquad (1)$$

Overlapping sets of indicators are then introduced to assess the extent to which different measures of living arrangements modify the baseline relationship between orphan status and nutritional status as summarized by β_1 in equation (1). These additional control variables include measures of household wealth, the educational status of adult females in the household, other household demographics, and relationship of the child to the household head. Of these living arrangements variables, relationship to household head is the only one that may vary across children within the same household. Hence, the OLS model with full controls for living arrangements can be expressed as follows:

$$Z_{i,h} = \alpha + \beta_1(orphan_{i,h}) + \beta_2(sex_{i,h}) + \beta_3(age_{i,h}) + \delta_1(w_h) + \delta_2(f\_ed_h) + \delta_3(demo_h) + \delta_4(rel_{i,h}) + \varepsilon_{i,h} \qquad (2)$$

where orphan is a set of indicators of orphan status and/or child-type; sex and age are indicators of the sex and age group of the child under observation; w is set of indicators for wealth status; f_ed is a measure of educational attainment among female adults in the household; demo is a construct of other household demographics including the number of women of reproductive age, older women, and children under age 13; and rel is an indicator of the child's relationship to the head of the household. The epsilon (ε) is a random error term assumed to be i.i.d. normal, with mean zero. Standard error estimates in all models are corrected for heteroskedasticity and clustering. The subscripts i and h refer to individuals and households, respectively.

In addition to OLS, household fixed effects (FE) models are employed to test for differences between orphans and non-orphans living in the same household. These models control for unobserved household characteristics that could be correlated both with orphan status and nutritional outcomes. For example, if households in which both orphans and non-orphans live have a greater propensity to care for children and these households also produce better nutritional outcomes, it could mask underlying nutritional differences that exist between orphans and non-orphans. These unobserved household characteristics that do not differ across children living in the same household are represented in the following equation by the term μ_h:

$$Z_{i,h} = \alpha + \beta_1(orphan_{i,h}) + \beta_2(sex_{i,h}) + \beta_3(age_{i,h}) + \delta_1(w_h * orphan) + \delta_4(rel_{i,h}) + \mu_h + \varepsilon_{i,h} \qquad (3)$$

In estimation, the term μ_h is represented as a dummy variable for each household and hence controls for unobserved characteristics that vary between households. Note that all household level variables (i.e variables that do not vary within the household but are the same for each and every person within the household) drop out of the FE model. As a result, differences between orphans and non-orphans cannot be identified in households that include only one or the other--all of the difference in nutritional status between orphans and non-orphans identified by the household fixed effects model is due to within-household variation, and these estimates only include blended households. A a result, the term w*orphan is included in the FE models. This interaction is necessary to identify to the mediating effect of wealth on orphan status, since wealth would be excluded from the fixed effect estimations since it is a household characteristic that does not vary across children within the same household.

Hypotheses

Of interest is whether orphans below the age of 60 months have significantly lower anthropometric indices than non-orphans, and whether the relationship between orphan status and nutritional status is moderated by children's living arrangements. Several testable hypotheses emerge from the foregoing discussion to address these research questions. The primary hypothesis is that orphan status and anthropometrics are negatively related. The relationship may be small due to the relatively low probability that young-aged children are orphans. As evidenced by Figure 1, the probability of being an orphan increases substantially with age, but exhibits little variation relative to that of anthropometric indices below the age of five years and particularly below the age of about 24 months.. Still, a relationship between orphan status and nutritional outcomes is hypothesized to be detectable by the samples employed here, which exceed those of previous studies by up to eight times.

Further, orphans' living arrangements are hypothesized to mediate their nutritional outcomes. Specifically, it is hypothesized that the relationship between orphan status and anthropometric indices will become more positive with three measures of living arrangements: increasing wealth, increasing adult female education, and higher numbers of adult women, controlling for the number of children. More distant relationships between children and household head are hypothesized to negatively affect the relationship between orphan status and nutritional outcomes, such that living in a household headed by one's grandparent will result in lower nutritional status, and living in households headed by other relatives will lower nutritional still.

Results

Summary statistics

Table 1 presents summary statistics of the outcome and control variables used in the regression analysis. Orphan prevalence in the study samples ranges from 3-17 percent (line 1). Orphan prevalence is highest in Lesotho, which also has the highest adult prevalence of HIV (23%). The next higher orphan prevalence is that of Kenya, at six percent. In all countries except Lesotho, half or more of the orphans live in blended households; in Lesotho, just over one-third of orphans live in blended households. These observations are consistent with the general hypothesis that drives presumptive targeting of orphans for assistance in sub-Saharan Africa, i.e., that traditional mechanisms of orphan care – fostering by households that already have children – may be deteriorating in the face of increasing HIV/AIDS prevalence and that orphans suffer as result.

As demonstrated by the summary statistics in Table 1, orphans indeed have lower anthropometric indices on average than non-orphans, for all measures in all of the study countries. The challenge, then, is to determine whether the observed differences are significant, and to identify their determinants. Simple t-tests of differences between groups indicate that only the orphan/non-orphan difference in height-for-age from Tanzania is significant at $\alpha = 0.05$. Differences in weight-for-age from Malawi and Tanzania, and in weight-for-height from Kenya and Zambia, are significant at $\alpha = 0.10$.

However, as noted earlier and confirmed in Table 1, orphans are older than non-orphans: mean age among orphans is 5 to 8 months higher than among non-orphans. The full sample means are 35 months among orphans and 28 among non-orphans, for a mean difference of seven months. This age difference could be driving the mean differences in anthropometry because nutritional status, particularly HAZ, worsens with age among pre-school children. It is thus of extreme importance to control for these differences in age when estimating the true orphan 'effect'.

There is some tendency for orphans to live in households with slightly lower adult female education and more elder women, though these differences are small. No consistent pattern of differences between orphans and non-orphans exists in the number of women of reproductive age or children in the household.

Relationship to household head demonstrates the starkest differences: orphans are much more likely to live in a household headed by a grandparent than non-orphans. At first look, this would appear natural since orphans are defined as having a deceased parent. But the orphan definition does not require that both parents are dead and there are relatively few double orphans in these samples. Surviving parents could maintain their previous headship status or adopt that of their deceased partner, though a substantial number clearly are not doing so. As is demonstrated by the regression analysis below, living in a household headed by one's grandparent can significantly affect a child's nutritional status, but this is not uniformly the case.

Table 1 also shows the distribution of children across the wealth quintiles. In only Malawi is there more than a 3 percentage point difference in the prevalence of orphans in the poorest quintile (31.5 versus 18.9 percent for orphans and and-orphans respectively). In Kenya the prevalence of orphans in the poorest quintile is actually marginally lower for orphans (22.6 percent) relative to non-orphans (24.6 percent). On the other hand, in both Kenya and Lesotho orphans are significantly less likely to appear in the richest quintile, but this does not hold for the other 3 countries. The idea that orphans are clustered among the poorest households is not borne out by these data, although the focus here is on a very young age group, where overall orphan prevalence is low.

In summary, while orphans do appear to have worse average nutritional outcomes relative to non-orphans, they also display significantly different personal characteristics (age) and live in households which are also different in terms of relationship to head and demographic composition. These differences could be driving the mean differences in nutritional status reported in Table 1, thus warranting the use of multivariate regression analysis to control for such differences and isolate the orphan 'effect'.

Baseline results

Estimates from the baseline regression (equation 1) were performed for each of the 3 nutritional indicators in each of the 5 countries, resulting in 15 possible effects of orphan status on nutrition, controlling only for age and sex of the child. For ease of exposition the estimates of β_1 are shown in Figure 2 along with their 90 percent confidence interval to assess statistical difference from 0. The signs on the coefficient estimates were inconsistent. The estimates range as broadly as –0.12 to 0.09 in models of height-for-age and as narrowly as +/–0.03 in models of weight-for-age, with standard errors on are the order of 0.09 and 0.07, respectively. The confidence interval for each and every estimate includes zero, indicating no significant orphan effect after controlling for age and sex. Hence the mean differences depicted in Table 1 are purely attributable to differences in age between orphans and non-orphans, since orphans are older and nutritional status deteriorates with age.

Main OLS results on orphan effects

The main models specify children in four groups depending on whether they are orphans or non-orphans and whether they live in a blended household, i.e., in a household that includes both orphan and non-orphan children. The analysis is organized as follows. For each nutritional indicator, a base model is estimated which includes only these three indicator variables—non-orphans in non-blended households are the omitted category and hence the reference group to which the estimates are compared. This base model is then augmented by adding increasingly more control variables to see whether these modify the baseline estimates: 1) including controls for wealth; 2) including controls for female education; 3) including controls for time-use or care-giving potential within the household; 4) including controls for relationship of the child to the head of the household. Thus for each outcome there are 5 models, the baseline plus these four.

The presentation of results is organized by nutritional outcome and the key orphan related coefficient estimates are summarized in Tables 2A (HAZ), 2B (WAZ) and 2C (WHZ) by model and country. Full results of each model for each outcome and country

(5 models, 5 countries, 3 outcomes for a total of 75 regression models) are provided in the appendces for the enthusiastic reader.

Results for HAZ across models: Table 2A shows the orphan related estimates for HAZ for the 5 models by country. Statistically significant estimates are in bold—thee indicate a non-random difference between the relevant type of child and the reference group (non-orphans in non-blended households). There are two orphan indicators in each model (those in blended and non-blended households) which gives a total of 50 orphan related coefficient estimates in Table 2A (2 per regression, 5 regressions per country, 5 countries). Only 4 of these 50 coefficients are statistically significant, and all of these are in Kenya. Moreover the point estimates are positive indicating that orphans in non-blended households in Kenya have better HAZ relative to the reference group. In column 2 for example, the point estimate indicates that these orphans are on average 0.283 z-scores taller than non-orphans in non-blended households. The fact that this point estimate increases slightly between model 2 and models 3-5 indicates that the distribution of the additional control variables are worse in orphan households (i.e they serve to depress child nutritional status in orphan households). When control is made for these, orphans in non-blended households actually do even better than non-orphans in non-blended households.

Results for WAZ across models: Summary results for WAZ are presented in Table 2B and follow the same format as in Table 2A. For this nutritional outcome, not one single orphan related coefficient is statistically significant, indicating no difference in average WAZ between orphans in any type of household and non-orphans in non-blended households. The effects that are significant relate to non-orphans in blended households;

in Kenya, Malawi and Tanzania these children tend to have higher WAZ relative to non-orphans in non-blended households, with the largest differences observed in Kenya. For example, in column (3), non-orphans in blended households have higher WAZ by about 0.15 (Kenya), 0.088 (Malawi) and 0.098 (Tanzania) z-scores respectively.

Results for WHZ across models: Summary results for WHZ are shown in Table 2C which also follows the same format as the previous two tables. Again, not one of the 50 orphan related coefficient estimates are statistically different from 0, indicating that orphans are no worse off than non-orphans in non-blended households in terms of average WHZ. As in Table 2B, non-orphans in blended households seem to have an advantage over non-orphans in non-blended households, particularly in Tanzania where statistical significance is found in 4 of the 5 models.

Main results on effects of living arrangements and household characteristics

The coefficient estimates demonstrating the effects of individual household and demographic factors, including living arrangements, are shown in the tables in the appendices. The main results are summarized here.

Wealth: Increasing wealth generally is associated with better nutritional status, except that wealth demonstrates little influence on weight-for-height in the four countries other than Kenya. This may be expected however since WHZ can be a volatile measure as it easily is affected by temporary illness. Children living in households in the two highest wealth quintiles fare particularly well with respect to height-for-age and weight-for-age, which may be expected since these are measures of longer-term well-being. Children living in these wealthier households score better than children in the poorest households on height-for-age and weight-for-age indices by 0.2 – 0.6 standard deviations.

In Tanzania the difference is as high as 0.8 standard deviations in height-for-age (Table 4A, columns 2-5). These results demonstrate that household wealth is the single most important determinant of nutritional status of resident children.

Female adult education: A year of education among adult females in the household, measured from the individual female member with highest attainment, has a small positive marginal effect on nutritional status. Coefficient estimates on this variable typically are significant, ranging 0.01 to 0.05 (see column 3 in Tables 1-5 in the appendices). If the difference between completion of secondary school and never starting secondary school is five years, this translates into differences in nutritional status of 0.05 – 0.25 standard deviations per year of schooling. The full results indicate that adult female education and wealth are positively correlated, since the wealth coefficients tend to decrease when female education is added to the model, yet each variable remains significant, indicating that they are capturing different dimensions of household capacity to produce child health.

Demographics: Controlling for wealth and adult female education, ambiguous results were obtained from the construct of household demographics that proxy for time available for childcare: numbers of women of reproductive age, elder women aged 50-70, and children aged less than 13 years (column 4 in Tables 1-5 of the appendices). Coefficients on women of reproductive age were significant only in models from Kenya and Zambia, of magnitude ranging 0.04 – 0.08. The coefficients on elder women were significant only in Tanzania, and ranged up to 0.13. Similarly, the number of children aged below 13 was negatively associated with nutritional status and significant in Kenya and Zambia, with coefficient ranging 0.02 – 0.05 in magnitude. In contrast, this coefficient was positive and significant in models of height- and weight-for-age from Tanzania, indicating an advantage of roughly 0.03 standard deviations (column 4 of Tables 4A and 4B).

Relationship to head: Relationship of the child to household head was examined in models with full controls for other measures of living arrangements (column 5 of Tables 1-5 in the appendices). This analysis also presents somewhat mixed results. In most models, children living in households headed by their grandparent demonstrated no difference from those living in households headed by their parent. Children living in grandparent-headed households do have poorer nutritional status in models of height- and weight-for-age in Tanzania (column 5 of Tables 4A and 4B), and weight-for-age and weight-for-height in Zambia (column 5 of Tables 5B and 5C), with negative coefficient estimates ranging in magnitude from 0.10 – 0.13. The single case in which such children fared better was with regard to weight-for-age in Malawi, where the difference was less than 0.09 standard deviations. Hence, taken together, these models indicate that children living in grandparent-headed households generally are no worse off than children living in households headed by their parents, when controlling for wealth and adult female education.

Household fixed effects

Household fixed effect models were implemented as a direct test of whether orphans and non-orphans differ in nutritional status when living in the same household. By their nature, these models provide a complete set of controls for unobserved household characteristics that may affect young children's nutritional status. Three specifications were employed. The baseline model controls for children's sex and age (column 6 in the appended Tables). Household wealth is then interacted with the indicator of whether the child is an orphan (column 7 in appended tables). Finally, indicators for the child's relationship to household head – whether the head of household is a grandparent or other relative – are added to the model (column 8 in appended tables).

These models fail to yield statistically significant estimates on orphan status in virtually all specifications. The controls for living arrangements offer little additional insight. Though the addition of controls for living arrangements appears to affect the estimates on orphan status in two cases out of 45 (weight-for-age in Kenya and height-for-age in Malawi), coefficients on the controls are not statistically significant. Coefficients on the interactions of wealth and orphan status are never significant and are inconsistent in sign, which agrees rather well with the findings of Case et al. (2004) who examine this interaction in the context of orphan schooling. In models from Kenya and Zambia only, child-level controls for relationship to household head exhibit a statistically significant negative relationship between living in a household headed by one's grandparent and nutritional status, relative to children in households headed by their parents. The relationship is strong, with magnitudes of approximately 0.3 standard deviations in Zambia (column 8 of Tables 5A and 5B) and 0.5 in Kenya (column 8 of Tables 1A, 1B and 1C). In the Zambian case, the estimates on living with another relative are even more negative, at about 0.4 standard deviations. For these few cases, the results are strongly suggestive of a discrimination explanation since the comparison is to children in the same household but whose parents are the household head. Still, these findings occur in only two of the five countries under analysis. No difference is observed due to relationship to household head in other fixed effect models.

Children in relative poverty

It is possible that the relationship between orphan status and nutritional outcomes is different in poorer households than in the overall sample, for example due to more restrictive household resource constraints. Figure 3 shows the proportion of orphans and non-orphans who live in households in the bottom two wealth quintiles. There is no clear pattern to indicate that orphans are over-represented in poorer households relative to non-orphans. Indeed, the results of t-tests on the proportion of each country sub-sample living in a household in the bottom two wealth quintiles reveals a statistically significant difference only in the case of Malawi.

The entire set of 75 OLS regression models (5 models, 3 indicators, 5 countries) were re-estimated using only the bottom 2 quintiles (the poorest 40% of the sample). A sub-set of these results is summarized in Table 3 for cases where the results are different from the full-sample ones. In 3 countries and for some outcomes, there is a statistically significant and negative orphan effect in the poorest 40% of the sample.

The strongest results supporting orphan deficits in this sub-sample are in HAZ from Zambia and Tanzania. Table 3 shows that in the fully-specified models (column 5), orphans in blended households are 0.549 (Tanzania) and 0.256 (Zambia) z-scores shorter than non-orphans in non-blended households. In Kenya orphans in blended households also have significantly lower z-scores of WHZ (of around 0.3), although this difference is no longer statistically significant when controls for relationship to head are included in the regression (Column 5). In this fully controlled model, the coefficient on living in a household headed by a grandparent is –0.231 and statistically significant. This indicates that in Kenya, orphans in relatively poor, blended households are worse off because they tend to live in grandparent-headed households. While the data do not allow a direct test of intra-household resource allocation, this finding is consistent with discrimination against orphans based on distance in kinship ties. For example, the de facto heads of these households may be aunts or uncles of the orphans and tend to favor their own children in resource allocation decisions. In household FE models for this sample, which compares orphans and non-orphans in the same households, there are no significant differences between the two groups of children (results available from the author). This indicates that blended households in the lower two quintiles of wealth are systematically worse off in terms of their ability to produce child nutrition. Note also that for HAZ in Kenya, orphans in non-blended households actually have an even larger nutritional advantage (by 0.5 z-scores) over non-orphans in non-blended households compared to the full sample results reported in Table 2A.

Discussion

Summary of main results

The analyses presented herein were undertaken on the hypothesis that differences exist in nutritional status between orphans and non-orphans in sub-Saharan Africa, but had gone undetected due to limitations on sample size in previous studies. Sample sizes in previous studies ranged from 1,100 to 1,200 children, while samples in this study range from 1,700 in Lesotho to 8,500 in Malawi. Models of height-for-age, weight-for-age and weight-for-height were estimated using data from five countries in sub-Saharan Africa with samples up to seven times those employed in previous research.

The picture that emerges is more complex than originally anticipated. The analyses indicate that orphans generally do not suffer poorer nutritional outcomes than non-orphans. Rather household wealth in particular, and in some cases relationship to household head, are the important determinants of nutritional status. Other aspects of living arrangements confer advantages or disadvantages on the nutritional status of the average child as might be expected, but inconsistently so and to less extent. These general outcomes do not hold in certain settings – orphans in blended households were worse off in Tanzania in terms of height-for-age, and orphans in non-blended households were better off in Kenya – but these exceptions reinforce the more general finding that there is not a consistent negative relationship between orphan status and nutrition.

Somewhat surprisingly, non-orphans in blended households were found to be better off than non-orphans in non-blended households in three of the five countries under analysis. This suggests that households that host orphans in these countries have greater capacity to care for children, at least in terms of the living arrangements measured in these models. Indeed, this effect was observed in Kenya, where orphans in non-blended households also were observed to experience better nutritional outcomes, suggesting that non-orphans in non-blended households in that country live in households that are particularly ineffective producers of child nutrition.

Possible explanation for findings

Young-aged orphans may fare relatively well because they are more easily assimilated by host households. In many societies young children are more likely to be adopted than older children. If all young children in the household "eat from the same pot," i.e., there are economies of scale in the household production of child feeding, then one would expect to observe little difference between orphans and non-orphans with the similar health endowments in the same household. Though some evidence was found to suggest within-household discrimination against orphans, this was not a general result. If discrimination in intrahousehold resource allocation exists based on kinship-ties, and if this stems from expected future remittances from the child to household decision makers, the latter may find it more efficient to nurture strength of relationship when they take in a child at an earlier age.

It is possible that differences in nutritional status between orphans and non-orphans exist but simply are not observable at young ages. The probability of being an orphan and of suffering nutritional deficits that translate into anthropometric indices both increase with age. This limits the power of a sample of very young children to detect relationships between them – a commonly held limitation of studies of orphans and nutrition (Greenblott & Greenaway 2007) – particularly so in models with household fixed effects. The fixed effect models exclude orphans and non-orphans in non-blended households, which were found in some OLS specifications to be important groups. More generally, the standard errors in fixed effect models with added controls increase dramatically, which suggests that the sizes of sub-samples relating to these categories are too small to support such detailed analysis.

Analyses using cross-sectional data frequently are criticized for their inability to support causal inference when regression results indicate a relationship between outcomes (e.g nutritional or schooling status) and the independent variables of interest (e.g orphan status). In the current study, the findings on orphan status typically are that no such relationship exists. Failure of the cross-sectional data to detect a negative relationship between orphan status and nutrition if one truly exists would require that orphans systematically start their childhoods with better nutritional status or are more resilient than non-orphans, both of which seem implausible.

Key policy implications

The key finding in this study is that the impact of orphan status per se on nutritional outcomes is weak or non-existent after controlling for wealth, kinship and age. These results confirm the findings of previous analyses, based on much smaller samples, that young orphans may not be worse off nutritionally than non-orphans. While orphan deficits are observed in some instances for some outcomes, the single most important factor determining nutritional status is household wealth.

The key implication is that policies of presumptive targeting of assistance to orphans to improve nutritional status would not be warranted. Rather, the identification of vulnerable children and their targeting for assistance should be based on indicators of poverty. That more examples of a significant relationship between orphan status and nutrition are found among poorer households further supports this conclusion: increasing wealth or, by extension, income among those households would apparently mitigate that relationship.

While orphans' kinship ties to the household head is important in some cases, using this as an indicator for targeting would require the delivery of assistance to the child directly, since assistance to the household may not confer the desired benefit to the more distantly related orphan. Further research using data that supports direct tests of intra-household resource allocation would help to tease out the origins of differences in nutritional status related to kinship with household head, as well as the occasional deficits observed among orphans living with non-orphans in poorer households. More important, however, is the need for analysis that would project differences in the returns to targeting strategies based on poverty, orphan status or other criteria.

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Tables and Figures

Table 2.1: Summary statistics for all children in sample (ages 0-59 months), by orphans status

	Kenya		Lesotho		Malawi		Tanzania		Zambia	
Orphan prevalence	5.9		16.6		4.4		2.9		4.8	
Adult HIV prevalence	6.7		23.2		11.7		7.0		15.3	
Observations										
	Non-orphan	Orphan	Non-orphan	Orphan	Non-orphan	Orphan	Non-orphan	Orphan	Non-orphan	Orphan
Living in blended households	0.08	0.55	0.27	0.37	0.14	0.44	0.13	0.52	0.17	0.70
Anthropometric indices										
Height-for-age	-1.19	-1.19	-1.59	-1.65	-1.80	-1.91	-1.55	-1.79	-1.85	-1.96
Weight-for-age	-0.93	-1.03	-1.00	-1.08	-1.04	-1.18	-1.14	-1.27	-1.28	-1.38
Weight-for-height	-0.23	-0.35	-0.02	-0.09	0.09	0.00	-0.23	-0.24	-0.18	-0.31
Age in months	28.6	33.1	28.9	34.1	28.4	35.1	28.5	36.3	28.3	36.9
Wealth quintiles										
Poorest	24.6	22.6	24.6	27.1	18.9	31.5	21.8	22.9	24.9	28.0
Poorer	19.6	21.6	25.3	25.4	21.6	19.7	19.8	23.8	23.0	21.4
Middle	18.7	20.3	19.4	25.7	23.5	19.5	20.3	21.1	23.5	15.5
Richer	16.0	22.6	16.3	14.4	21.1	14.7	22.5	17.5	16.9	22.9
Richest	21.0	12.8	14.4	7.4	15.0	14.7	15.5	14.8	11.7	12.2
Proportion who are female	49.8	52.7	49.2	48.6	50.2	50.9	50.3	48.4	50.1	45.4
Adult female education (yrs)	6.7	6.7	7.4	6.8	4.2	3.9	5.4	5.0	5.5	5.9
Other household demographics (no.)										
Women of reproductive age	1.4	1.5	1.6	1.6	1.2	1.2	1.5	1.5	1.5	1.6
Elder women	0.1	0.4	0.3	0.5	0.1	0.3	0.2	0.4	0.1	0.4
Children < 13 years	3.2	3.1	2.9	3.1	3.0	3.3	3.6	3.5	3.5	3.7
Relationship to Household Head										
Child	84.0	46.6	52.7	31.3	85.5	50.9	77.6	38.1	79.7	42.1
Grandchild	13.0	44.9	38.4	58.1	11.6	39.2	16.7	39.5	14.1	42.4
Other relative	2.9	8.4	8.9	10.6	2.8	9.9	5.7	22.4	6.2	15.5

All figures are percentages, except as noted for observations, adult female education and other demographics. Figures listed for wealth, sex, adult female education and relationship to household are for all children in sample.

Table 2.2A: Summary regression results of effect of child-type on HAZ

Controls included in model:*	baseline	wealth	Female education	demographics	relationship to head
	(1)	(2)	(3)	(4)	(5)
KENYA					
Orphans in Blended Households	-0.036	0.001	0.019	0.003	0.007
	(0.120)	(0.122)	(0.118)	(0.121)	(0.125)
Orphans in Non-Blended Households	0.259	0.283	0.313	0.312	0.290
	(0.133)	(0.134)	(0.135)	(0.137)	(0.140)
Non-Orphans in Blended Households	0.072	0.081	0.088	0.079	0.111
	(0.084)	(0.083)	(0.084)	(0.088)	(0.089)
Observations	5028	5028	4977	4977	4938
LESOTHO					
Orphans in Blended Households	0.012	0.058	0.051	0.107	0.103
	(0.149)	(0.151)	(0.151)	(0.157)	(0.159)
Orphans in Non-Blended Households	0.015	0.042	0.058	0.049	0.051
	(0.107)	(0.106)	(0.107)	(0.107)	(0.109)
Non-Orphans in Blended Households	-0.016	0.005	-0.003	0.031	0.04
	(0.088)	(0.086)	(0.086)	(0.092)	(0.096)
Observations	1721	1721	1718	1718	1711
MALAWI					
Orphans in Blended Households	0.047	0.027	-0.028	-0.024	-0.038
	(0.131)	(0.129)	(0.123)	(0.126)	(0.132)
Orphans in Non-Blended Households	-0.057	-0.001	0.003	0.004	0.008
	(0.097)	(0.097)	(0.098)	(0.099)	(0.105)
Non-Orphans in Blended Households	0.093	0.039	0.049	0.051	0.042
	(0.048)	(0.049)	(0.049)	(0.051)	(0.052)
Observations	8629	8629	8552	8552	8378
TANZANIA					
Orphans in Blended Households	-0.162	-0.184	-0.185	-0.229	-0.234
	(0.127)	(0.121)	(0.120)	(0.118)	(0.125)
Orphans in Non-Blended Households	-0.03	0.036	0.073	0.091	0.113
	(0.139)	(0.135)	(0.139)	(0.140)	(0.140)
Non-Orphans in Blended Households	0.097	0.042	0.041	-0.018	-0.007
	(0.044)	(0.043)	(0.043)	(0.043)	(0.043)
Observations	7910	7910	7851	7851	7643
ZAMBIA					
Orphans in Blended Households	0.022	-0.004	-0.034	0.011	0.015
	(0.101)	(0.097)	(0.098)	(0.097)	(0.101)
Orphans in Non-Blended Households	0.183	0.166	0.155	0.164	0.159
	(0.166)	(0.163)	(0.169)	(0.170)	(0.184)
Non-Orphans in Blended Households	0.036	-0.019	-0.055	-0.011	-0.024
	(0.052)	(0.053)	(0.052)	(0.055)	(0.054)
Observations	5806	5806	5762	5762	5659

* (1) Baseline model includes age and sex only; models (2)-(5) include age and sex plus the set of variables indicated at the top of the column. Robust standard errors in parentheses. Coefficients in bold are significant at $p \leq 0.05$. See Appendix A for full results of all models.

Table 2.2B: Summary regression results of effect of child-type on WAZ

Controls included in model:*	Baseline	wealth	Female education	demographics	relationship to head
	(1)	(2)	(3)	(4)	(5)
KENYA					
Orphans in Blended Households	-0.074	-0.045	-0.056	-0.049	-0.015
	(0.101)	(0.102)	(0.098)	(0.099)	(0.103)
Orphans in Non-Blended Households	0.13	0.158	0.212	0.210	0.202
	(0.118)	(0.117)	(0.112)	(0.116)	(0.119)
Non-Orphans in Blended Households	0.149	**0.156**	**0.151**	**0.170**	**0.203**
	(0.077)	(0.075)	(0.074)	(0.076)	(0.077)
Observations	5112	5112	5061	5061	5022
LESOTHO					
Orphans in Blended Households	0.021	0.066	0.054	0.096	0.085
	(0.140)	(0.139)	(0.138)	(0.146)	(0.148)
Orphans in Non-Blended Households	0.012	0.041	0.06	0.054	0.047
	(0.093)	(0.092)	(0.092)	(0.093)	(0.095)
Non-Orphans in Blended Households	0.08	0.1	0.087	0.112	0.101
	(0.079)	(0.078)	(0.077)	(0.084)	(0.085)
Observations	1752	1752	1749	1749	1741
MALAWI					
Orphans in Blended Households	0.07	0.051	0.033	0.029	0.007
	(0.099)	(0.097)	(0.096)	(0.096)	(0.104)
Orphans in Non-Blended Households	-0.071	-0.022	-0.019	-0.019	-0.013
	(0.075)	(0.075)	(0.075)	(0.075)	(0.080)
Non-Orphans in Blended Households	**0.129**	**0.094**	**0.088**	**0.085**	**0.079**
	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)
Observations	8888	8888	8808	8808	8625
TANZANIA					
Orphans in Blended Households	0.017	0.003	-0.013	-0.044	0
	(0.091)	(0.089)	(0.089)	(0.089)	(0.103)
Orphans in Non-Blended Households	-0.05	-0.011	-0.01	0.007	0.023
	(0.112)	(0.109)	(0.114)	(0.114)	(0.115)
Non-Orphans in Blended Households	**0.123**	**0.092**	**0.098**	0.054	0.069
	(0.040)	(0.040)	(0.040)	(0.042)	(0.041)
Observations	7971	7971	7912	7912	7703
ZAMBIA					
Orphans in Blended Households	0.043	0.024	0.004	0.028	0.062
	(0.081)	(0.081)	(0.081)	(0.080)	(0.082)
Orphans in Non-Blended Households	0.02	0.011	0.02	0.029	0.083
	(0.114)	(0.113)	(0.118)	(0.121)	(0.129)
Non-Orphans in Blended Households	0.006	-0.035	-0.056	-0.024	-0.015
	(0.047)	(0.048)	(0.048)	(0.049)	(0.050)
Observations	5969	5969	5925	5925	5822

* (1) Baseline model includes age and sex only; models (2)-(5) include age and sex plus the set of variables indicated at the top of the column. Robust standard errors in parentheses. Coefficients in bold are significant at $p \leq 0.05$. See Appendix A for full results of all models.

Table 2.2C: Summary regression results of effect of child-type on WHZ

Controls included in model:*	baseline	wealth	Female education	demographics	relationship to head
	(1)	(2)	(3)	(4)	(5)
KENYA					
Orphans in Blended Households	-0.097	-0.091	-0.128	-0.114	-0.084
	(0.095)	(0.093)	(0.092)	(0.094)	(0.096)
Orphans in Non-Blended Households	-0.051	-0.039	0.022	0.013	0.017
	(0.109)	(0.107)	(0.103)	(0.105)	(0.110)
Non-Orphans in Blended Households	0.099	0.101	0.094	0.126	**0.141**
	(0.071)	(0.069)	(0.067)	(0.069)	(0.069)
Observations	5192	5192	5134	5134	5095
LESOTHO					
Orphans in Blended Households	0.001	0.016	0.012	0.033	0.012
	(0.130)	(0.128)	(0.129)	(0.139)	(0.140)
Orphans in Non-Blended Households	0.028	0.04	0.054	0.054	0.042
	(0.084)	(0.084)	(0.085)	(0.087)	(0.088)
Non-Orphans in Blended Households	0.105	0.114	0.104	0.118	0.09
	(0.073)	(0.073)	(0.073)	(0.080)	(0.082)
Observations	1780	1780	1776	1776	1768
MALAWI					
Orphans in Blended Households	0.01	0.009	0.02	0.017	-0.026
	(0.093)	(0.093)	(0.094)	(0.095)	(0.103)
Orphans in Non-Blended Households	-0.031	-0.021	-0.017	-0.016	-0.041
	(0.079)	(0.080)	(0.080)	(0.080)	(0.086)
Non-Orphans in Blended Households	**0.083**	**0.085**	0.070	0.068	0.061
	(0.038)	(0.038)	(0.039)	(0.040)	(0.041)
Observations	8892	8892	8812	8812	8626
TANZANIA					
Orphans in Blended Households	0.072	0.073	0.055	0.042	0.085
	(0.086)	(0.086)	(0.087)	(0.087)	(0.093)
Orphans in Non-Blended Households	0.021	0.017	-0.006	-0.004	-0.001
	(0.104)	(0.104)	(0.104)	(0.104)	(0.105)
Non-Orphans in Blended Households	**0.080**	**0.082**	**0.089**	0.075	**0.082**
	(0.037)	(0.037)	(0.037)	(0.039)	(0.040)
Observations	8016	8016	7957	7957	7744
ZAMBIA					
Orphans in Blended Households	-0.07	-0.072	-0.074	-0.076	-0.05
	(0.073)	(0.073)	(0.073)	(0.072)	(0.076)
Orphans in Non-Blended Households	-0.157	-0.155	-0.139	-0.134	-0.064
	(0.118)	(0.118)	(0.123)	(0.124)	(0.132)
Non-Orphans in Blended Households	-0.006	-0.012	-0.012	-0.006	0.011
	(0.035)	(0.035)	(0.036)	(0.036)	(0.037)
Observations	6029	6029	5985	5985	5880

* (1) Baseline model includes age and sex only; models (2)-(5) include age and sex plus the set of variables indicated at the top of the column. Robust standard errors in parentheses. Coefficients in bold are significant at $p \leq 0.05$. See Appendix A for full results of all models.

Table 2.3: Selected OLS results of effect of child-type on nutrition for households in lower two wealth quintiles

Controls included in model:*	baseline	wealth	Female education	demographics	relationship to head
	(1)	(2)	(3)	(4)	(5)
KENYA: height-for-age					
Orphans in Blended Households	0.045	0.04	0.108	0.134	0.044
	(0.204)	(0.204)	(0.191)	(0.193)	(0.200)
Orphans in Non-Blended Households	**0.519**	**0.516**	**0.531**	**0.554**	**0.536**
	(0.192)	(0.193)	(0.197)	(0.199)	(0.208)
Non-Orphans in Blended Households	-0.038	-0.041	-0.013	0.001	0.003
	(0.122)	(0.122)	(0.121)	(0.123)	(0.125)
Observations	2219	2219	2196	2196	2185
KENYA: weight-for-age					
Orphans in Blended Households	-0.11	-0.127	-0.09	-0.086	-0.043
	(0.142)	(0.142)	(0.128)	(0.132)	(0.139)
Orphans in Non-Blended Households	0.283	0.276	0.367	0.347	0.350
	(0.193)	(0.193)	(0.181)	(0.184)	(0.191)
Non-Orphans in Blended Households	0.172	0.168	0.183	0.186	0.212
	(0.105)	(0.106)	(0.105)	(0.108)	(0.112)
Observations	2266	2266	2243	2243	2232
KENYA: weight-for-height					
Orphans in Blended Households	**-0.279**	**-0.291**	**-0.308**	**-0.304**	-0.215
	(0.132)	(0.135)	(0.125)	(0.126)	(0.132)
Orphans in Non-Blended Households	-0.048	-0.059	0.052	0.027	0.042
	(0.180)	(0.180)	(0.162)	(0.166)	(0.175)
Non-Orphans in Blended Households	0.156	0.155	0.159	0.161	0.183
	(0.103)	(0.101)	(0.099)	(0.102)	(0.104)
Observations	2298	2298	2272	2272	2261
TANZANIA height-for-age					
Orphans in Blended Households	**-0.440**	**-0.441**	**-0.444**	**-0.510**	**-0.549**
	(0.184)	(0.185)	(0.185)	(0.180)	(0.176)
Orphans in Non-Blended Households	0.014	0.013	0.04	0.071	0.092
	(0.208)	(0.208)	(0.214)	(0.213)	(0.215)
Non-Orphans in Blended Households	0.062	0.062	0.052	-0.044	-0.043
	(0.071)	(0.071)	(0.069)	(0.070)	(0.072)
Observations	3288	3288	3259	3259	3189
ZAMBIA height-for-age					
Orphans in Blended Households	**-0.266**	**-0.264**	**-0.275**	**-0.253**	**-0.256**
	(0.129)	(0.129)	(0.131)	(0.134)	(0.144)
Orphans in Non-Blended Households	0.333	0.338	0.304	0.328	0.303
	(0.249)	(0.250)	(0.251)	(0.254)	(0.264)
Non-Orphans in Blended Households	0.02	0.018	-0.005	0.022	-0.013
	(0.088)	(0.088)	(0.089)	(0.095)	(0.094)
Observations	2781	2781	2764	2764	2717

* (1) Baseline model includes age and sex only; models (2)-(5) include age and sex plus the set of variables indicated at the top of the column. Robust standard errors in parentheses. Coefficients in bold are significant at $p \leq 0.05$. Full results available from author.

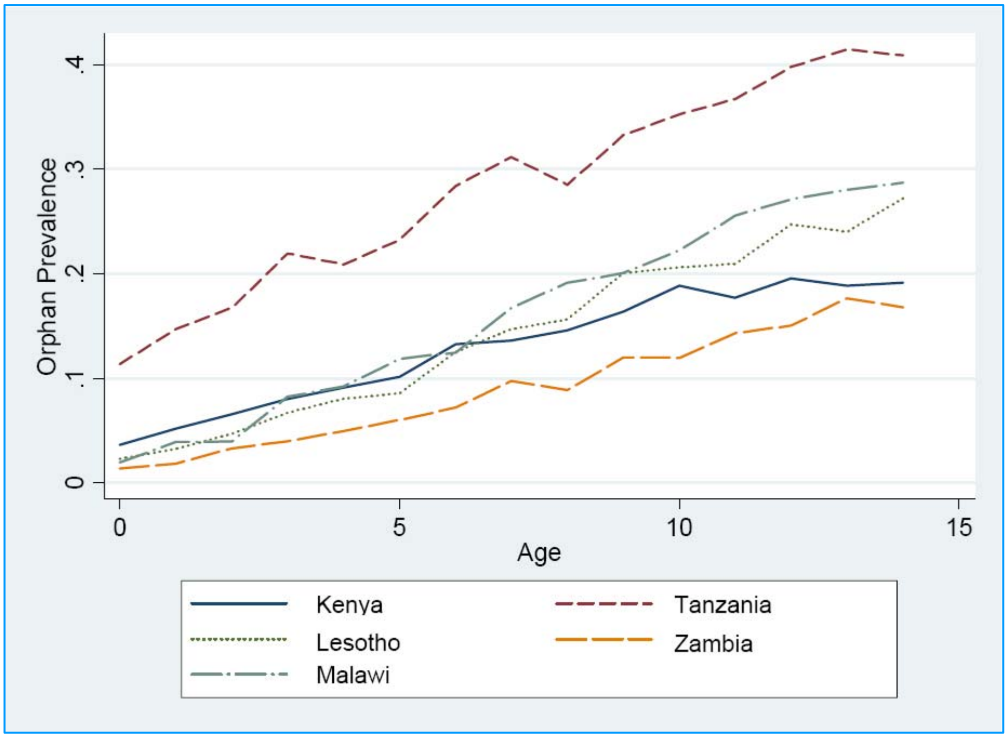

Figure 2.1A: Orphan prevalence among children aged 0 – 14 years, by country

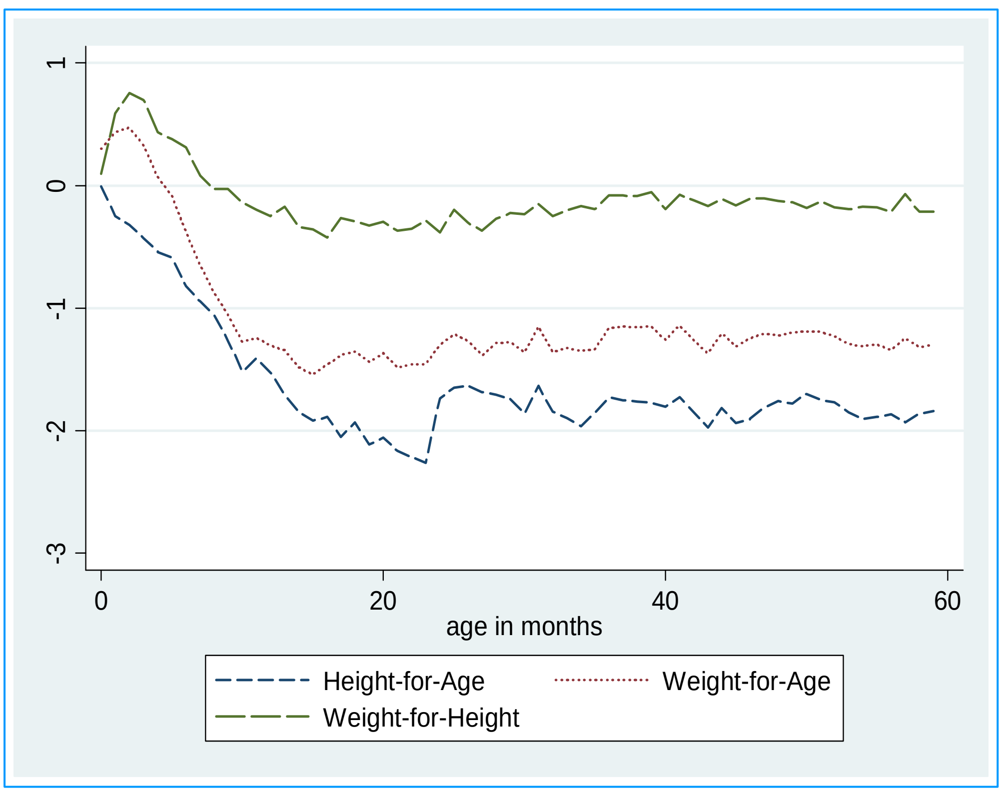

Figure 2.1B: Age-specific anthropometric indices among children aged 0-59 months, all countries

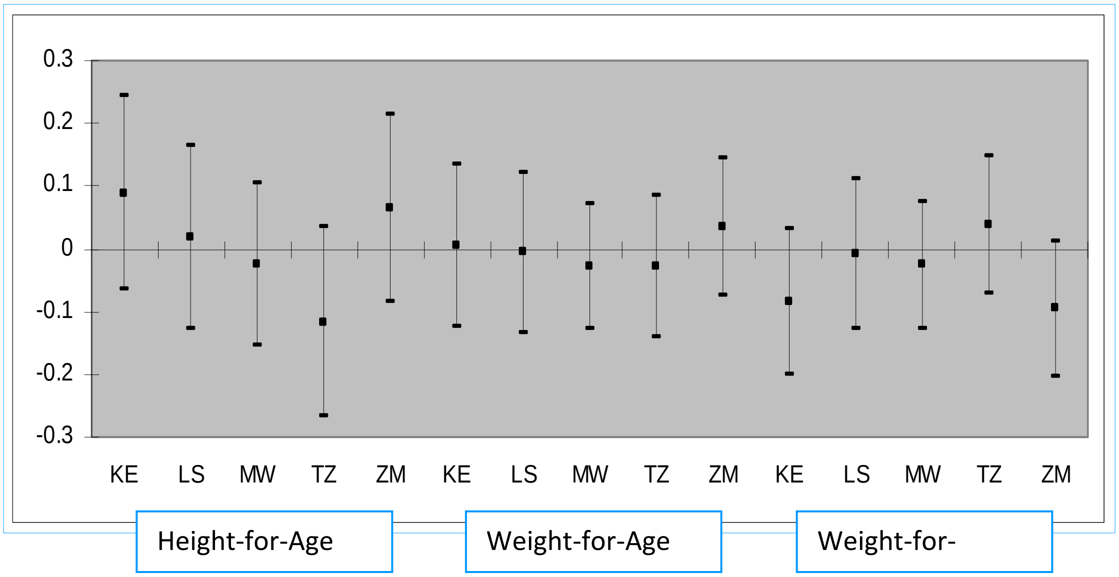

Figure 2.2: Coefficient estimates and 90% confidence intervals for orphan effects controlling for age and sex

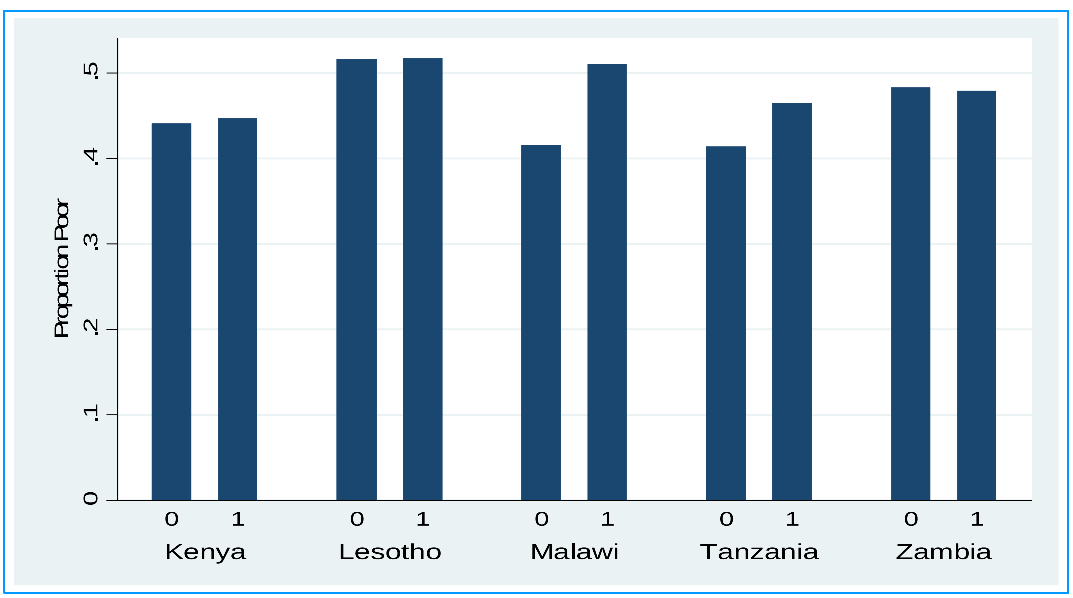

Figure 2.3: Proportion of orphans and non-orphans living in households in lower two wealth quintiles, among children aged 0-59 months
Notes: "0" = non-orphan; "1" = orphan

CHAPTER III: REACHING OVC THROUGH CASH TRANSFERS IN SUB-SAHARAN AFRICA: SIMULATION RESULTS FROM ALTERNATIVE TARGETING SCHEMES

Introduction

Social cash transfers (CTs), small predictable sums of money to poor and vulnerable families, are a relatively new social protection instrument in East and Southern Africa (ESA). However this instrument is rapidly gaining popularity as an effective intervention to enhance the participation of the poor in economic development, and to combat inequality, social exclusion and chronic poverty. In the HIV and AIDS policy dialogue in particular, the 'protective' dimension of programming in the 4 Ps increasingly calls for the use of social cash transfers to support families that care for orphans and other children affected by AIDS (UNICEF AND UNAIDS 2004). Advocacy among AIDS scholars for such programs is driven by the fact that AIDS is the number one cause of prime-age mortality in sub-Saharan Africa (SSA), and the region hosts approximately 25-30 million orphans, one third of whom have lost a parent to the disease. AIDS related prime-age adult mortality has seen life expectancy rates decline dramatically in the region, and has severely weakened family support systems already stretched thin by extreme chronic poverty. In this context, CTs are increasingly being called for as an AIDS mitigation measure, to help families cope with increasing dependency ratios and the associated burden of care, and to protect the health and human capital development of orphans and other vulnerable children (OVC).

In ESA the largest cash transfer program for children is South Africa's national child support grant (CSG) which reaches over 9 million children up to age 14 and which is being expanded to cover children up to age 18 over the next 4 years. However several countries have smaller programs, either demonstrations (e.g. Kenya, Malawi, Zambia), or established programs but with low coverage (e.g. Mozambique). Lesotho is currently designing a CT targeted to OVC, while Botswana and Namibia both have either in-kind or cash assistance programs for families that care for orphans. Several other countries are currently considering implementing CTs on a trial basis including Rwanda, Tanzania, and Uganda. These types of programs are thus very much part of the social policy dialogue in ESA, and in March 2006 13 countries in the region, under the auspices of the African Union, signed the Livingstone (Zambia) Call for Action, which essentially pledged countries to develop national social protection strategies, and to specifically design and implement social cash transfers within the next 3 years. A follow-up to the original Livingstone Meeting, known as Livingstone 2 and involving the entire continent, is currently underway with national and regional meetings on social protection, and an African Union Ministerial Meeting planned for October 2008 which will bring together African Ministers of Social Development to discuss and adopt a framework for Social Development, including Social Protection, for the continent.

As momentum gathers around CTs, a host of technical questions arise on program design parameters such as targeting, transfer levels, and overall costs and affordability. An important policy question from the OVC angle is how to scale-up such programs to reach children most in need of assistance. A recent study (Schubert 2007) analyzed the demographic composition of participant households under the Zambia and Malawi pilots, which are confined to a single district within each country, and concluded that these two programs reach a significant number of AIDS affected households, including OVC, though such households are not explicitly targeted. On the other hand, the CT demonstration in Kenya targets OVC households directly, while in Mozambique the CT program targets the elderly and anyone who is disabled or chronically sick living in a poor household; all these programs are thought to capture a significant number of AIDS affected households, including OVC, but none of these programs operate at scale. Both for these countries and others in design phase such as Lesotho, Rwanda and Uganda, the policy question of interest is to determine which of these alternative targeting schemes would capture the most vulnerable children if taken to scale.

This paper simulates the coverage and related impact on poverty and schooling of OVC of national cash transfer schemes in four ESA countries, using nationally representative household budget and expenditure surveys. We compare the efficiency of alternative CT targeting strategies in terms of coverage amongst the poorest deciles; assess the poverty impacts of alternative targeting schemes; and conduct empirical estimation of the effects of the alternative targeting strategies on the school enrollment of OVC in eligible households. This paper is methodologically very similar to Kakwani, Soares & Son (2006), who also use microsimulations to predict the 'impact' of CTs on poverty and school enrollment. However our paper differs in several respects to that one. First, our focus is on comparing specific targeting schemes which are actually in existence in ESA, while Kakwani et al focus on a generic set of programs including universal ones; in that sense our results are of greater practical relevance to the current debates on program design in the region. Second, given the strong OVC and AIDS mitigation undercurrent in the CT dialogue, we explicitly consider the performance of these specific schemes in reaching orphans and other ultra-poor children, since these groups are typically cited as the main target population for such programs. Finally, our modeling of school enrollment focuses on the relevant behavioral parameter in the target population—the poorest 30 percent of households—which provides a much more accurate assessment of the ability of CTs to affect schooling than that reported in Kakwani et al.

Methods

Nationally representative household expenditure surveys from 4 ESA countries, Malawi, Mozambique, Uganda and Zambia, are employed to compare the efficiency of alternative CT targeting strategies. The modeled strategies represent somewhat stylized versions of the actual targeting strategies employed in existing demonstration programs in the region. Analysis of each strategy in each country yields results relative to the baseline assumption of having no program; comparison of the results across strategies allows inference to be drawn regarding each strategy's performance against specific policy objectives. The policy objective of interest here is to maximize the benefit from CT programs that accrues to OVC, as measured by coverage in the poorest deciles, changes in the consumption of households that contain OVC, and school enrolment of OVC. For the purposes of this study, orphans are defined in the survey as children who do not live with one or both parents, while vulnerable children are those from poorest deciles, with the poorer the decile the more vulnerable the child.

Identification of recipient households

The five strategies under analysis target all households in the lower three deciles of the national consumption distribution that meet, respectively, the following criteria:

1. Labor-constrained households, which have no able-bodied members between the ages of 15 and 60, inclusive, or have a dependency ratio greater than three.
2. Households with age-vulnerable or disabled adults. Age-vulnerable households have a female member above the age of 55 or a male member above the age of 60, or a disabled or chronically ill adult.
3. Households with children. "Vulnerable children" are defined in this study as the poorest children, hence this scheme effectively targets poor households with children less than 18 years of age.
4. Households with orphans.
5. The poorest households, employed as a benchmark that represents perfect targeting for policies with the sole objective of poverty alleviation.

As mentioned earlier, the first 4 schemes represent stylized versions of existing CT programs in the region. Scheme 1 is currently used in Malawi and in one small pilot area in Zambia; scheme 2 is used in the *Programa Seguranca Alimentar* CT in Mozambique; scheme 3 is similar to the OVC-CT program in Kenya; scheme 4 is similar to the OVC program in Botswana. Essential characteristics of 4 of the 5 schemes are presented in Table A1 in the annex. All schemes attempt to focus transfers on the ultra-poor, usually the poorest 10 or 20 percent of households, through community based targeting mechanisms.

The typical CT makes transfers to households, not to individuals. In this analysis, recipient households are identified by their ranking in terms of *per capita* consumption conditional on eligibility for benefit under each targeting strategy. Transfers are assigned first to the poorest households that meet the eligibility criteria, moving up through the consumption ranking until all eligible households have been assigned or a presumed program budget constraint is met. In this process, household weights are used to determine the number of households from the population represented by each household in the sample. Our method thus assumes perfect targeting, and limits leakage to households within the bottom 3 deciles—we do not allow transfers to otherwise eligible households in the 4th quintile or higher even if there is space in the program budget to do so.

Program parameters

Ideally, CT programs strike a balance between providing sufficient resources to pursue a policy objective and avoiding distortion of consumption patterns. In each country analysis, the transfer value is set at approximately 30 percent of median consumption among households in the lowest quintile of the consumption distribution. This is calculated as the product of the weighted median per capita consumption and weighted median household size in the lowest quintile of the individual consumption distribution. Figure 1, taken from UNICEF-ESARO (2008), shows transfer levels in selected CT programs in Latin America and Africa as a percentage of the national poverty line. These range from about 30 percent in Colombia down to about 10 percent in some of the Africa programs. These latter programs however tend to focus transfers on the poorest 10-20 percent of the population whose consumption is less than half of the respective national poverty lines. Hence transfers likely represent around 20-40 percent of the average consumption per person in these programs, which explains our use of a transfer level set at 30 percent of median consumption of the poorest quintile in each country.

The national budget constraint is set at 0.5 percent of each country's GDP, an amount that is considered to be politically feasible in Africa at this time, and that is often used in dialogue with governments as an indicative fiscal envelope for such programs; similar large scale programs in Brazil and Mexico also cost around this amount. Anticipation of the budget constraint is reflected in the modeled targeting strategies by limiting eligibility to households with per capita consumption that falls below the 30th percentile of the national consumption distribution, i.e., households in the lowest three deciles of *per capita* consumption. The national budget constraint includes administrative costs, which are valued at twenty percent of total transfers in each country.

Efficiency of alternative targeting strategies

Upon identification of recipient households, the number of individuals who would benefit from a CT program is estimated using household or population weights, as appropriate. These results are used to estimate changes in the poverty headcount ratio (H), poverty gap ratio (PG), and squared poverty gap ratio (SPG) that would result from a specific targeting strategy. These measures are calculated by the following formulas. The headcount poverty ratio measures the proportion of the population living below the poverty line:

$$H = \frac{\sum h_i}{\sum i} \qquad (1)$$

where *i* represents individuals in the population and *h* is an indicator that the individual's per capita consumption is below the poverty line. Summations for all three measures are over *i*, or across the population represented by the household sample. In practice, these measures are derived using population weights calculated as the product of household size and sample household weight. The poverty gap ratio, which measures the proportional difference between per capita consumption and the poverty line for those in poverty, is calculated by:

$$PG = \sum\left[h_i * \frac{(povline - pc_i)}{povline}\right] \tag{2}$$

where *povline* is the poverty line in each country and *pc* is *per capita* consumption for the individual *i*. Finally, the squared poverty gap ratio is:

$$SPG = \sum\left[h_i * \frac{(povline - pc_i)}{povline}\right]^2 \tag{3}$$

which places greater emphasis on the welfare of individuals in the poorest households, by adding emphasis in the calculation to larger gaps in the difference between their *per capita* consumption and the poverty line. A decrease in any of the three measures represents an improvement in poverty.

Because it is assumed that the poorest households that meet eligibility criteria are the first to enter under each targeting strategy, the efficiency of alternative targeting strategies is also assessed by profiling the recipient population in terms of numbers of households, individuals and OVC, and where they fall within the national consumption distribution. Of particular interest in this analysis is the extent to which OVC receive transfers under targeting strategies that do not explicitly target OVC, as in strategies that target labor-constrained households, households with age-vulnerable or disabled adults, or households based solely on poverty criteria. The extent of benefit to OVC is measured by the total number of participating OVC; the highest consumption decile of participating OVC; and the proportion of OVC recipients by consumption decile. Targeting strategies that reach higher numbers of OVC and that demonstrate efficiency by reaching OVC in the poorest households are preferred under a policy objective of maximizing benefit to OVC.

Consumption and schooling

The relationship between enrollment and consumption is estimated for children aged 6-17 years using a reduced-form model that reflects the results of household decisions regarding investment in children's education (Deaton 1997). Intrahousehold resource allocation decisions are not modeled explicitly. The study employs a probit specification of the following model using both child-level and household characteristics:

$$enroll_i = \alpha_0 + \beta\left[\ln(pc_h)\right] + \chi_i\gamma + \kappa_h\lambda + \varepsilon_i\,, \qquad (4)$$

where *enroll* is a dichotomous indicator of enrollment status; $\ln(pc_h)$ is the log of per capita consumption; χ_i is a vector of child-specific characteristics with coefficients γ; and κ_h is a vector of household characteristics with coefficients λ. The included individual characteristics are age, sex, and orphan status. The included household characteristics are education of the household head, the log of household size, whether the household exists in an urban or rural location, and time required to travel to school.[3]

This estimation strategy does not support causal analysis, but rather provides estimates of the association between consumption and enrollment, and between orphan status and enrollment.[4] In a full behavioral model of the household economy, schooling, leisure and consumption are jointly chosen, and so would be modeled separately. Unobserved preferences and abilities would also determine all these outcomes, requiring more advanced econometric techniques such as instrumental variables or household fixed effects to control for such heterogeneity. The analysis undertaken here is in the spirit of the conditional demand literature in that schooling is estimated conditional on a given level of household consumption. Changes in the level of consumption are then simulated through the various CT schemes, and new schooling rates are predicted. These predictions will be over-estimates of the 'true' impact of the transfer on schooling if there is positive correlation between total expenditures or income and tastes for schooling (through for example unobserved ability to generate income). Note that the estimation sample is limited to children who live in households in the lowest three deciles of per capita consumption. This sample restriction promotes an estimate of the association between consumption and enrollment that reflects consumption patterns among the general target group for CT programs modeled in this analysis, which may be different than consumption patterns across the population. In particular, consumption is more

[3] Travel time is not measured similarly cross survey instruments, and in the case of Uganda, distance in kilometers is reported rather than travel time. In all cases the cluster mean value of either distance or travel time is used in the analysis.

[4] Interactions between consumption and orphan status were explored, but were found not to be jointly significant.

likely to be a binding constraint on enrollment decisions for poorer households than for wealthier households. Using the full sample would likely attenuate the estimated relationship and result in underestimation of the impact of CTs on enrollment among beneficiaries.

Cash transfers and schooling

The impact of alternative targeting strategies is estimated by comparing the predicted probability of enrollment among children in participating households with and without the cash transfer. Participating households under each targeting strategy are identified as previously described, i.e., by their ranking on *per capita* consumption conditional on eligibility under each set of targeting criteria. Participating children are those children observed in the estimation sample who are members of participating households. CT impact is projected only for recipient children thus identified, which varies by targeting strategy.

Under each targeting strategy, baseline estimates of the probability of enrollment are predicted using observed per capita consumption data and the results obtained by estimation of equation (4):

$$\Pr\left[enroll_i = 1\right] = \Phi\left(\hat{\alpha}_0 + \hat{\beta}\left[\ln(pc_h)\right] + \chi_i\hat{\gamma} + \kappa_h\hat{\lambda}\right) \qquad (5)$$

where the theoretical coefficients in (4) are replaced by the corresponding estimates obtained from probit estimation and the probability of enrollment is estimated using the probit operator Φ. The predicted probability of enrollment *with* the cash transfer also is estimated from equation (5), replacing the term pc_h with $pc_h' = pc_h + T/hhsize$. The latter expression represents the new value of *per capita* consumption after a transfer of value T to a household with *hhsize* members. Differences in the population-weighted means of estimated enrollment probabilities among recipient children at baseline and with a cash transfer are then compared across alternative targeting strategies.

These analyses employ certain assumptions that are important for interpretation of the results. First is the assumption of perfect targeting within each stated targeting strategy. This assumption yields best-case estimates of the schooling impact of alternative CT designs, but may not reflect results obtained in practice. A second key assumption is that households maintain constant consumption patterns upon receipt of a cash transfer, including the allocation of household resources to individual members. This requires not that intrahousehold allocation of resources is equivalent across all children, e.g. orphans and non-orphans in the same household, but that relative allocations are maintained after receipt of a transfer. A third assumption requires also that participating households in the simulation of enrollment impacts, equation (5), are homogeneous in their propensity to consume additional income. While the assumption of uniform propensity to consume may seem unreasonable across a general population, recall that CT programs target the poorest households in a consumption distribution that already can be characterized as poor on average. Hence, it is plausible to assume that the participating households' propensity to consume is unity, i.e., that small increments of additional income will be consumed in full. To the extent this is true, the assumption of uniform propensity to consume across households will be met.

Data and summary statistics

Data

Household income and expenditure surveys from Malawi, Mozambique, Uganda and Zambia are used for empirical analysis of the association between consumption and schooling, and estimation of the poverty and schooling impacts of cash transfers. Specifically, they are the Second Integrated Household Survey (IHS) from Malawi (2004); the *Inquerito aos Agregados Familiares* 2002-03 (IAF) from Mozambique; the Uganda National Household Survey (2005-06) and the Living Conditions Monitoring Survey IV (LCMS) from Zambia (2004). These surveys are similar in structure; they are cross-sectional in nature and support nationally representative analysis.

The policy variable of interest in these analyses is *per capita* consumption, calculated as the household's aggregate consumption divided by household size. Although receipt of a cash transfer represents an increase in income, use of the consumption variable helps to avoid problems associated with underreporting of income and measurement of household production. The household consumption aggregates employed are those calculated by the national statistics offices that manage the surveys. Consumption aggregates are adjusted for local prices, so that the purchasing power of equal consumption levels is equivalent across sample clusters. *Per capita* consumption is used to rank eligible households for identification of participation under alternative CT targeting schemes and as an independent variable in the enrollment analyses.

Individual characteristics – age, sex, disability, and enrollment status for children – are identified from the household roster when the roster contained these variables, or from the health and education sections of the household questionnaires. In the enrollment analysis, age is specified by two splines for ages 6-13 and 14-17. A household is considered to host an adult with a disability if any person aged 18 or above was reported as having any disability. Children are identified as being enrolled if they are reported as currently attending school.

Household characteristics included in the enrollment analysis are education of the household head, the log of household size, whether the household exists in an urban or rural location, and time required for travel to school, except in Uganda where distance in kilometers is available only. The household head's education is specified as a construct with three categories: whether the person has no formal education or some primary education; has completed primary education; or has completed secondary education. The cost of travel to school is imputed as a cluster-level mean of travel time, specified as a continuous variable when possible, or as a categorical variable using the modal response.

Descriptive analysis

Descriptive statistics for the data supporting the poverty and schooling analyses are presented in Table 1. Though one cannot compare poverty lines and, hence, poverty rates between countries directly, due to differences that may exist in the consumption basket used to calculate poverty lines, these data offer some useful comparisons across country and may have some predictive value regarding the comparative results of the analysis. GDP is much higher in Uganda at USD 10.6 billion than in the other three countries. Malawi's GDP is USD 1.9 billion; Mozambique's is USD 4.1 billion and Zambia's is USD 5.4 billion. Inflating GDP figures with country-specific consumer price indices and using 2007 foreign exchange rates, the resultant CT budgets for each country, set as a percentage (0.5%) of GDP, would be approximately 12.1, 28.8, 39.8, and 53.0 USD million (2007) for Malawi, Mozambique, Zambia and Uganda respectively.

Examination of the baseline poverty indicators supports a general conclusion that larger numbers of individuals will be predicted to receive transfers under CT programs in Zambia and Uganda than in the other two countries in this study, and that the lowest numbers will occur in Malawi. Zambia has the highest poverty headcount ratio (H = 0.70) and the highest squared poverty gap ratio (SPG = 0.25): not only does a larger proportion of the population live below the poverty line in Zambia, but the gap between *per capita* consumption and the poverty line is greater in Zambia for the poorest households. Malawi and Mozambique have similar H and SPG, while all poverty indicators are lowest in Uganda and Uganda also has the largest population at 30 million. These basic features suggest that Uganda and Zambia will likely have the largest coverage for any given program, and Malawi will have the smallest given its small population size and GDP.

Descriptive statistics for the schooling analysis, presented in the lower panel of Table 1, are for the sub-sample of children living in households in the target group defined by the lowest three consumption deciles. Of these children, more are of secondary school age (14-17) while among primary school age (6-13), more are likely to be enrolled in school in Uganda (73 percent and 80 percent) than in the other countries. In Zambia, the proportion of children of secondary school age who are enrolled (68%) is higher than the proportion of children of primary school age (59%). Mean age and household size and gender ratios are similar across countries. One might expect that greater increases in school enrollment will be realized in samples with lower baseline enrollment rates, but simulations based on empirical analysis do not bear this out; rather, the highest enrollment increases are estimated in Uganda, which has the highest mean enrollment rates.

Other household characteristics of these children – education of the household head and household setting – have potential predictive value for the results of the schooling simulations. If households headed by individuals with more education have stronger preferences for education, one would expect their income-elasticity of schooling to be lower. Likewise, if households set in rural areas have higher opportunity costs of their children attending school due to travel time and the alternative uses of children's time, e.g. food production, such households would be expected to have a higher income elasticity of schooling. The proportion of children living in a household headed by an individual with no education or some primary education is highest in Malawi (90%). In Zambia, the proportion of children living in a household headed by an individual who has completed secondary education is highest (7%). In Mozambique, 69 percent of children in the sample live in households headed by someone with no or some primary education, while 32 percent of children in the target households live in urban areas. In sum, based on the descriptive statistics alone, one might expect a stronger enrollment response to cash transfers in Malawi than in Zambia, with the enrollment response in Mozambique falling in between. This is consistent with the simulation results discussed below.

Results

Total costs

Table 2 presents results for the total cost of each program if implemented under the parameters described earlier. Table 2 demonstrate that a CT program that targets labor-constrained households will reach individuals in the third decile of the consumption distribution without exhausting the budget, i.e., under perfect targeting assumptions all eligible households in the target group would be reached and program resources would be left over. While the program budget constraint would be approached in Malawi (95 percent) and Mozambique (94 percent), a much lower proportion of the budget would be used in Uganda (80 percent) and Zambia (29 percent), indicating that if a government is willing to expend the specified budget for CT programs more coverage might be reached under alternative targeting schemes, unless the government was willing to distribute transfers to households in the 4^{th} decile of per capita consumption.

Targeting age- and disability-vulnerable households would exhaust the budget in Malawi, Mozambique and Uganda but not in Zambia, presumably due to the very different demographic profile of the poor in Zambia. The same is the case for an orphan targeting strategy—in Zambia targeting orphans in the poorest 3 deciles would only expend 55 percent of the program budget (0.5 percent of GDP). On the other hand, CT programs that target households with children would both exhaust the budget and reach poorer households on average. Recipients under child-centered targeting would both exhaust the budget and reach only individuals living in the lowest decile of consumption in Malawi, Mozambique and Uganda; in Zambia, a small proportion of individuals in the second consumption decile would be reached as well (results not shown).

In all four countries, the proportional gain in per capita consumption is higher for strategies that target children explicitly, as compared to strategies that target labor-constrained, age- and disability-vulnerable or orphan households. In Malawi the range of proportional increase in per capita consumption across targeting strategies is 35-48 percent, in Mozambique 36-61 percent, in Uganda 34-50 percent and in Zambia 50-75 percent. In all cases, the greatest proportional increase in per capita consumption is obtained through a strategy that explicitly targets the poorest households, and these results are almost identical to a strategy that explicitly targets children. On the other hand, explicitly targeting orphans results to the lowest gain in per capita consumption among recipients in Uganda and Zambia, while in Malawi the gain among orphan households is the same as the gain among labor constraints households.

Coverage

Counts of recipients by type, presented in Table 3, demonstrate that strategies which explicitly target households with children tend to reach more individuals and more children than other targeting strategies. Targeting of labor-constrained households reaches the fewest households and the fewest individuals, not surprising since such households tend to focus benefits on elderly households. In Malawi, all programs tend to reach the same number of households, but a child or strict poverty focused program reaches more individuals and children.

Strategies that target households with age-vulnerable or disabled adults reach nearly as many individuals as strategies that target children in Malawi and Mozambique, but do not reach children or the ultra-poor with similar efficiency. For example, in Mozambique the age-targeted scheme actually reaches more households (148,828) than the child targeted one (149,409), but reaches only 637,255 children versus 1,009,127 in the latter.

Most interesting is the scheme that targets poor households with orphans for it highlights the dilemma faced by governments in an environment where the social protection agenda is driven by vulnerability to HIV and AIDS. Evaluations of pilot CTs have used the proportion of beneficiaries who are OVC or who are orphans as a metric of the benefit conferred on these populations of interest, or on AIDS affected households. Simulations in this study find that this measure is roughly comparable across targeting strategies. In Malawi, children represent 65 percent of recipients under all strategies except one that targets age- or disability-households (54%). A similar pattern is in Mozambique (54-60 percent), Zambia (42-51 percent) and Uganda (53-71 percent). Naturally orphans represent the largest proportion of recipients under the orphan-targeted scheme (36, 30 and 36 percent respectively in Malawi, Zambia and Uganda), with the labor constraints scheme a distant second. While the orphan strategy reaches the most number of orphans, it reaches the fewer children in total relative to the child targeted scheme, and reaches fewer people in the poorest consumption decile as well. Because orphans are not concentrated in the poorest decile, policy-makers face a trade-off in the type of vulnerability to focus on: income vulnerability versus orphanhood.

From the perspective of a policy objective to reach the most vulnerable children, more informative than simple counts of recipients is the proportion of children in households in the lowest three consumption deciles that would be reached under alternative targeting strategies. Table 4 shows the proportion of children and orphans that would be reached in each of the three poorest consumption deciles under alternative targeting strategies. These results indicate that a strategy which targets households with children is most efficient at reaching children in the poorest households--the highest proportion of children in the lower deciles of consumption are reached under such a targeting strategy focused on poor households with children. In contrast, an orphan strategy reaches all orphans in the lowest decile, but misses many other children in that decile. For example, such a strategy reaches about 28 percent of the poorest children (those in the bottom decile) in Malawi, Zambia and Uganda, compared to 39, 100 and 53 percent respectively under the child focused strategy. In contrast, the child focused strategy in Zambia also reaches 100 percent of orphans in the poorest decile because, as mentioned earlier, in Zambia there are very few orphans in the poorest decile. In Malawi and Uganda however, this scheme reaches 46 and 50 percent of orphans in the lowest decile respectively.

Figures 2-4 further illustrate the policy trade-off faced by governments in Eastern & Southern Africa as they seek to protect the most vulnerable children through targeted CTs. The last two bars in each cluster show the percent of all children and percent of all orphans reached in all 3 of the bottom deciles in contrast to Table 4 which shows the percent reached in each decile by itself. In general, more children of any kind are reached by either the child or orphan centered scheme in the 3 countries shown (Malawi, Zambia and Uganda), particularly children in the poorest consumption decile. In all 3 countries, the orphan scheme reaches all orphans in the bottom decile, but fewer children in that decile illustrating the potential trade-off in vulnerability targeting. But the trade-off becomes less clear when all children in the bottom 3 deciles are considered. In Malawi for example, if the bottom 3 deciles are taken together, then the 'coverage' of the orphan scheme among all children is about the same as the child focused scheme, but the coverage of orphans is significantly higher. The same is the case in Uganda: the coverage among all children in the bottom 3 deciles is the about the same in either scheme, but the coverage of orphans is higher in the orphan focused scheme.

It is only when one focuses on the ultra-poorest children, those in the bottom decile, that the distinction between the two schemes (child focused versus orphan focused) becomes clear. If policy makers give greater weight to this group, and if targeting is possible, then the scheme that favors children over orphans will reach the same more children in the poorest decile and about the same number of orphans in that decile as well, relative to an orphan targeted scheme.

Poverty analysis

Estimates of the three poverty indicators – the poverty headcount ratio (H), the poverty gap ratio (PG), and the squared poverty gap ratio (SPG) – at baseline and that result from simulation of alternative targeting schemes are shown in the upper panel of Table 5. The lower panel lists the percentage improvement – decreases in the ratios – from baseline associated with each targeting strategy. With assistance to OVC as the policy objective, and since vulnerability is identified by the lowest levels of consumption (i.e general household income poverty), the SPG is the most pertinent indicator of differences between targeting strategies.

In all countries the largest improvements in SPG are achieved by strategies that target households with children or the poorest households. Strategies that target labor-constrained households have the smallest effect. For example, in Mozambique targeting households with children or prioritizing the poorest households is projected to decrease the SPG by nearly nine percent, from 0.103 to 0.094; a strategy that targets labor-constrained households would decrease the SPG by only 5.8 percent. The associated results in Malawi are estimated at 8.75 percent and five percent, respectively. Although the respective proportional differences in SPG in Zambia are smaller in magnitude when each strategy is compared to baseline (4.9 and 1.2 percent), the magnitude of the proportional difference obtained by a strategy that explicitly targets children is four times the magnitude of the proportional decrease that would be obtained through a strategy focused on household labor constraints. The overall percentage changes in SPG are largest in Uganda, but this is purely because of the very low base (0.044) in that country. But even in Uganda, the strategy of targeting households with children improves the SPG by roughly double and triple compared to the strategy that targets age vulnerability or labor-constraints respectively.

The performance of a strategy of explicitly targeting orphans varies across countries, though it is never better (in terms of the SPG) than targeting children in general. In Zambia, targeting orphans actually performs worse than targeting age vulnerability in terms of improvements in both the PG and SPG. This further illustrates the targeting dilemma in Eastern & Southern Africa. An orphan driven social protection intervention that distributes cash to households with orphans will not reach the poorest households.

Since the general target group for CTs simulated in this analysis is limited to households within the lowest three consumption deciles and the poverty rate in all countries except Uganda is well above 30 percent, one would expect the poverty headcount ratio not to be affected by implementation of a CT in these three countries. In Malawi and Mozambique, however, the poverty headcount ratio does decrease with strategies that target labor-constrained households, if only by 0.2 percent. The economic profile of beneficiaries shown in Table 2 suggests that in these two countries these targeting strategies confer benefits on households that enable them to rise above the poverty line at the margin even though the target group is limited to the lowest three deciles of the consumption distribution. Several factors appear to be at work.

The program budget is not exhausted by programs that target labor-constrained households, so all eligible households within the target group under that strategy obtain transfers (i.e. all households in the bottom three deciles). The difference between the baseline H in Zambia (70%) and the cut-off for eligibility (30%) is substantially higher than in Malawi and Mozambique; this contributes to the differences in SPG between Malawi and Mozambique, on the one hand, and Zambia on the other. The relatively low baseline SPG in Malawi and Mozambique suggests that eligible households in the target group in these countries are much nearer the poverty line relative to those in Zambia; the relatively low baseline SPG in Uganda is due to that country's much lower overall poverty rate. In summary, the size of the transfer though small is sufficient to push certain households in the third consumption decile above the poverty line under certain targeting schemes in Malawi, Mozambique and Uganda, but not in Zambia.

Schooling analysis

The association between school enrollment and household per capita consumption was estimated using a reduced form probit regression and samples of children aged 6-17 who live in households in the lowest three deciles of the consumption distribution. These results are presented in Table 6. The results indicate the estimation models perform generally as expected, with some exceptions. Coefficient estimates on the log of per capita consumption are statistically significant for Malawi, Mozambique and Uganda but not Zambia; the magnitude of the estimates range from 0.67 (Uganda) to 0.17 for Mozambique.

In all study countries, the probability of enrollment increases with age among primary-school aged children, likely due to delays in starting school. In contrast, the probability of enrollment decreases with age among secondary-school aged children, possibly due to increased probabilities of dropping out as perceived returns to education may decrease with grade and the opportunity costs of school attendance increase with age, as well as structural constraints such as the fewer places in secondary schools. Estimates on distance-to-school variables, not reported in Table 6, were negative in all models, but statistically significant for Mozambique and Uganda. A gender gap for education is observed only in Mozambique, where girls are less likely to be enrolled in school than boys. Maternal orphans are less likely to be enrolled in Malawi; paternal orphans in Zambia. Orphan status could not be determined for the Mozambique sample. Children in households headed by individuals with more education are more likely to be enrolled in school than those living in households in which heads have not completed primary school. Household size tends to be positively associated with the probability of enrollment, perhaps because larger households offer greater availability of substitutes for the child's input to household production. Children in urban households are more likely to be enrolled in school, perhaps again because the opportunity cost of children's school attendance to other household production is lower in urban areas than in rural.

Simulations of the impact of CTs on school enrollment are presented in Table 7. Within country, variation in the estimated increase in enrollment is due to differences in targeting strategies. Simulations were conducted using sub-samples defined by children in recipient households. Based on samples from Malawi, the expected increase in school enrollment is 3.5 to 5 percentage points for all children aged 6-17, depending on the targeting strategy. The estimated increase is higher among secondary-school aged children (3.8-5.3 percentage points) than for primary-school aged children (3.4-4.9). For Mozambique, the expected increase is lower by half, indicating an increase of 1.5-2.6 percentage points in enrollment among all children, 1.6-2.6 among primary-school aged children, and 1.5-2.6 among secondary-school aged children. The estimated impacts are largest in Uganda, where they range from 3.9 to 6.1 percentage points in primary and 3.4 to 5.8 points in secondary. These simulated results compare favorably to impact estimates on enrollment in *conditional* cash transfer programs in Mexico (7 point increase at secondary level) and Bangladesh (8 point increase at primary level), as well as the unconditional South African Child Support Grant scheme (7 points) (EPRI, 2008).

In all countries, comparison of the estimated impact across targeting strategies indicates that targeting households with children or the poorest households produces greater impact on school enrollment than other targeting strategies. Targeting the poorest households regardless of household structure yields the highest increases among the recipient population; targeting households with children is a close second-best. In Mozambique and Uganda either of these two targeting strategies is estimated to produce increases in enrollment approximately one-third greater than strategies that target labor-constrained or age- or disability-vulnerable households. In Malawi, targeting households with children or the poorest households would yield enrollment increases about one-fifth greater than a strategy that targets labor-constrained households and over a fourth greater than a strategy targeting age- or disability-vulnerable households. This of course is because the labor-constrained targeting scheme reaches fewer children than the other ones.

What is noteworthy in Table 7 is that the orphan targeted scheme yields lower improvements in school enrollment compared to either the child focused or pure poverty focused scheme. This is for two reasons. First, the pure poverty focused scheme captures more of the poorest children due to the demographic composition of the ultra-poor, and it is precisely among this group that economic constraints are most binding. The flip side to this is that the orphan scheme reaches more orphans but in relatively better off households, where actual school attendance rates are higher, leading a lower potential for impact.

Conclusions and policy implications

This analysis investigates the extent to which different targeting schemes currently under trial in ESA would reach OVC if they went to scale. The pilot studies in question employ different targeting strategies. Programs in Malawi and Zambia target labor-constrained households. In Mozambique, the CT targets age- or disability-vulnerable households. A third strategy places special emphasis on the presence of children in the household, similar to the pilot program in Kenya though Kenyan data were unavailable for the analysis and a fourth strategy in place in Botswana is to target families with orphans. Finally, a strategy that targets households based purely on consumption rankings was included for comparison. All of these programs include an aim to provide resources to the "poorest of the poor" except for Botswana where the program is not poverty targeted. Small scale research on several pilots have evaluated well and some of these evaluations document that a substantial proportion of recipients are AIDS affected. The primary question is whether this would be true in the national context, or whether evaluation results are a function of the selection of the location for the pilot programs; there may also be demographic differences across countries which imply that results from one area cannot be generalized to another.

This paper finds that the proportion of recipients who are orphans is fairly consistent across targeting strategies that do not explicitly target orphans, though a strategy that targets age- or disability-vulnerable households is slightly less effective in this regard. Orphan targeted schemes implemented according to the parameters set out in this paper would have about a third of all recipients (i.e all recipient household members) as orphans.

However a key question that arises in this analysis is whether the proportion of recipients who are orphans is a sufficient metric to assess the efficiency with which any particular targeting strategy reaches orphans. The results suggest that this is not the case: substantial variation exists across targeting strategies in the economic profiles, counts and the proportion of *ultra-poor* orphans that are reached by CTs, as well as the projected impact on enrollment rates among program participants. The economic profile of recipient households indicates that targeting households with children in the poorest households concentrates resources in the lowest consumption deciles, while the benefits of other strategies are more diffuse, reaching households in higher consumption deciles and not always making full use of the available budget. On the other hand, an orphan focused strategy reaches the most number of orphans, but includes households into the third consumption decile while excluding many of the poorest children. This highlights the key dilemma faced by policy makers in a context where social protection is driven by the HIV and AIDS mitigation agenda. There is a trade-off between pure poverty targeting, or targeting poor households with children, and targeting households with orphans. This trade-off is particularly important when we focus on the ultra-poorest households, those in the bottom consumption decile.

From the perspective of AIDS mitigation and vulnerability due to extreme poverty, the most relevant indicator of targeting efficiency may be the coverage of orphans and children in the lowest consumption decile; on this score the most efficient scheme is one that targets poor households with children. In all countries, such a scheme reaches the most number of children in the poorest decile and covers about 50 percent of orphans in the poorest deciles. The win-win of targeting poor households with children is best exemplified in Zambia, where the proposed strategy of targeting poor households with children reaches 100 percent of all children and 100 percent of orphans in the bottom consumption decile.

Results of the enrollment simulations clearly show that targeting households with children or the poorest households achieve higher increases in enrollment in all of the study countries than strategies that target labor-constrained or age- or disability-vulnerable or orphan households. That the highest proportional increases in school enrollment are projected under a poverty-based targeting strategy is consistent with the notion that household budgets are binding constraints on children's enrollment; also at work here is the fact that the poorest households nearly always contain school-aged children.

There is substantial variation in the projected enrollment effects of CTs, from roughly six percentage points in Uganda to less than one in Zambia. Since the only variable that changes in the simulations is consumption, these differences are due to differences in the income-elasticity of demand for education across countries. Heads of households in the Zambian sample exhibit higher education on average than in the Ugandan sample. If individuals with more education value education more highly then it is reasonable to assume that their income-elasticity of demand for education is lower, thus yielding a lower response to increases in income. Income-elasticity of demand for education may also be higher when the cost of education is higher. It is telling however that despite universal free primary schooling in countries like Malawi and Uganda, income constraints due to either out-of-pocket or opportunity costs still remain a barrier to access, highlighting the need for complementary demand side interventions such as CTs to enable the remaining 20 percent of children to attend school.

In summary, explicit targeting of households with children is projected to reach higher proportions of children in the lowest consumption deciles, which implies greater targeting efficiency under a set of policy objectives that places emphasize on the welfare of vulnerable children where vulnerability is assumed to be strongly correlated with extreme poverty. Such a strategy also would reach larger numbers of orphans, yield higher proportional increases in per capita consumption, and produce larger increases in school enrollment than strategies that target labor-constrained, age- or disability-vulnerable or orphan households. A strategy that targets the poorest households regardless of household structure performs slightly better in terms of increases in per capita consumption and enrollment, but does not reach as many OVC as targeting households with children.

The main policy implication of this work is that, while the numbers of participating children may be reasonably comparable between certain targeting strategies, the distribution of benefits under a child-centered targeting strategy clearly favors the poorest of the poor and also reaches the poorest orphans. To the extent that vulnerability is directly correlated with extreme poverty, CTs that target ultra poor households with children will have the greatest impact on OVC in the region.

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Tables and Figures

Table 3.1: Summary statistics, by country, for poverty and schooling analyses.

	Malawi	Mozambique	Zambia	Uganda
Poverty analysis				
Population (million)	12.2	18.3	10.8	30
GDP (USD billion)	1.90	4.09	5.44	10.6
Poverty line, monthly (USD)	9.71	10.07	26.13	13.8
Per capita consumption, monthly (USD)	15.04	14.94	32.88	23.57
Baseline poverty indicators				
Poverty headcount ratio	0.524	0.541	0.701	0.351
Poverty gap ratio	0.178	0.205	0.376	0.105
Squared poverty gap ratio	0.080	0.103	0.245	0.044
Household size (mean)	4.5	4.8	5.2	5.3
Households in sample	11,280	8,700	19,236	7,421
Schooling analysis (children aged 6-17 in bottom 3 deciles)				
Percent enrolled				
Age 6-13	79.4	62.3	59.2	79.8
Age 14-17	68.7	56.6	68.0	72.9
Age	10.7	10.8	11.1	10.9
Female (percent)	50.2	48.1	48.9	48.9
Household size	7.1	7.1	7.8	7.7
Household head's education (percent)				
None or some primary	90.1	68.6	71.5	75.6
Completed primary	8.9	17.3	21.4	19.3
Completed secondary	0.6	6.1	7.1	5.1
Percent urban	4.5	31.6	17.3	6.1
Observations	5,830	4,734	11,908	4,649

Notes: Gross domestic product values obtained from the IMF (2007). Summary statistics for the poverty analysis are computed using population weights that were derived from household weights and household size. Summary statistics for the schooling analysis are computed as weighted means for children aged 6-17 years. Monetary data are given in USD 2007. Time required to travel to school is omitted from this table due to differences in the specification of this variable -- continuous or categorical -- across individual surveys.

Table 3.2: Economic profile of recipients and budget requirements

	Highest Decile Reached	Mean increase in per capita consumption among recipients (%)	Total Cost (USD)	Total Cost as Percent of Budget
Malawi (budget: $12.1 million)				
labor-constrained HHs	3	41.2	11,524,837	95
HHs w/elderly or disabled	2	34.9	12,084,516	100
HHs w/children	1	47.7	12,071,317	100
HHs with orphans	2	40.1	12,084,535	100
poorest households	1	48.0	12,072,154	100
Mozambique (budget: $28.8 million)				
labor-constrained HHs	3	35.7	27,110,732	94
HHs w/elderly or disabled	2	43.6	28,780,488	100
HHs w/children	1	58.8	28,699,892	100
HHs with orphans				
poorest households	1	60.9	28,788,674	100
Zambia (budget: $39.8 million)				
labor-constrained HHs	3	50.0	11,497,877	29
HHs w/elderly or disabled	3	45.7	29,259,454	73
HHs w/children	2	66.4	39,806,512	100
HHs with orphans	3	41.1	22,042,706	55
poorest households	2	74.7	39,836,816	100
Uganda (budget $52.8 million)				
labor-constrained HHs	3	38.4	42,038,392	80
HHs w/elderly or disabled	3	38.6	52,887,784	100
HHs w/children	1	48.3	52,779,932	100
HHs with orphans	2	33.8	52,834,124	100
poorest households	1	50.4	52,751,096	100

Notes: Results presented are from analysis of the full household sample, using population weights.

Table 3.3: Numbers of recipients under alternative targeting strategies, by demographic characteristic and country

	Households	Mean HH Size	Total Individuals	Ultra-Poor	Children	Orphans	Children as % of total	Orphans as % of total
Malawi								
labor-constrained HHs	62,224	5.08	314,014	118,652	205,893	58,617	65.6	18.7
HHs w/elderly or disabled	63,482	6.71	421,404	235,716	226,615	39,579	53.8	9.4
HHs w/children	63,235	7.03	440,313	440,313	286,279	50,586	65.0	11.5
HHs w/orphans	63,450	6.84	425,749	342,052	276,720	152,861	65.0	35.9
poorest households	63,459	7.01	440,145	440,145	285,455	50,586	64.9	11.5
Mozambique								
labor-constrained HHs	141,136	6.06	854,144	369,352	503,066		58.9	
HHs w/elderly or disabled	149,828	6.80	988,668	637,255	530,230		53.6	
HHs w/children	149,409	6.81	1,009,127	1,009,127	608,562		60.3	
HHs with orphans								
poorest households	149,871	6.63	990,553	990,553	588,452		59.4	
Zambia								
labor-constrained HHs	60,345	6.52	378,588	138,334	170,820	42,757	45.1	11.3
HHs w/elderly or disabled	153,564	6.59	993,257	375,408	418,401	112,120	42.1	11.3
HHs w/children	208,918	6.76	1,389,992	1,021,885	675,581	111,898	48.6	8.1
HHs w/orphans	115,688	7.13	816,336	263,042	412,567	241,358		
poorest households	209,077	6.36	1,309,219	1,079,562	602,378	96,526	46.0	7.4
Uganda								
labor-constrained HHs	173,042	5.26	940,484	352,576	665,192	170,453	70.7	18.1
HHs w/elderly or disabled	217,701	5.85	1,271,875	577,616	679,340	175,458	53.4	13.8
HHs w/children	217,257	6.64	1,448,851	1,448,851	954,572	150,237	65.9	10.4
HHs w/orphans	217,480	6.73	1,472,188	758,934	975,614	536,064		
poorest households	217,138	6.45	1,409,427	1,409,427	913,035	138,812	64.8	9.8

Notes: HH Size is household size. Numbers of recipients are calculated from the full household sample, using population weights. Orphans cannot be identified from the Mozambique IAF.

Table 3.4: Percentage of all children and orphans who are reached under alternative CT targeting criteria, by household consumption decile

	Children			Orphans		
Wealth Decile	Lowest	Second	Third	Lowest	Second	Third
Malawi						
labor-constrained HHs	10.1	9.0	8.1	20.2	19.2	13.9
HHs w/elderly | disabled	17.1	12.7	0.0	19.0	15.3	0.0
HHs w/children	37.9	0.0	0.0	45.3	0.0	0.0
HHs w/orphans						
poorest households	37.6	0.0	0.0	45.0	0.0	0.0
Mozambique						
labor-constrained HHs	20.4	13.9	12.5			
HHs w/elderly | disabled	31.3	17.6	0.0			
HHs w/children	55.6	0.0	0.0			
poorest households	53.8	0.0	0.0			
Zambia						
labor-constrained HHs	12.3	11.7	10.4	19.1	18.1	15.9
HHs w/elderly | disabled	31.7	28.5	23.9	49.1	47.9	42.3
HHs w/children	100.0	36.0	0.0	100.0	38.5	0.0
poorest households	100.0	21.4	0.0	100.0	19.8	0.0
Uganda						
labor-constrained HHs	14.5	10.6	13.1	25.3	19.7	22.9
HHs w/elderly | disabled	17.5	19.4	1.9	24.4	30.2	1.7
HHs w/children	53.2	0.0	0.0	54.4	0.0	0.0
poorest households	50.9	0.0	0.0	51.7	0.0	0.0

Notes: Numbers of recipients and totals in target group are calculated from the full household sample, using population weights. Orphans cannot be identified from the Mozambique IAF.

Table 3.5 : Absolute value and percentage change in poverty indicators due to alternative cash transfer targeting schemes

	Malawi			Mozambique			Zambia			Uganda		
	H	PG	SPG	H	PG	SPG	H	PG	SPG	H	PG	SPG
Targeting Strategy												
baseline	0.524	0.178	0.080	0.541	0.205	0.103	0.701	0.376	0.245	0.350	0.105	0.044
labor-constrained HHs	0.523	0.173	0.076	0.540	0.199	0.097	0.701	0.374	0.242	0.340	0.098	0.041
HHs w/elderly or disabled	0.524	0.173	0.075	0.541	0.198	0.095	0.701	0.371	0.237	0.350	0.096	0.038
HHs w/children	0.524	0.173	0.073	0.541	0.198	0.094	0.701	0.369	0.233	0.350	0.095	0.034
HHs w/orphans	0.524	0.173	0.075				0.701	0.372	0.239	0.350	0.095	0.037
poorest households	0.524	0.173	0.073	0.541	0.198	0.094	0.701	0.369	0.233	0.350	0.095	0.034
Percentage decrease from baseline												
labor-constrained HHs	0.19	2.81	5.00	0.18	2.93	5.83	0.00	0.53	1.22	1.99	6.67	6.82
HHs w/elderly or disabled	0.00	2.81	6.25	0.00	3.41	7.77	0.00	1.33	3.27	1.14	8.57	13.64
HHs w/orphans	0.00	2.81	6.25				0.00	1.06	2.45	0.28	9.52	15.91
HHs w/children	0.00	2.81	8.75	0.00	3.41	8.74	0.00	1.86	4.90	0.00	9.52	22.73
poorest households	0.00	2.81	8.75	0.00	3.41	8.74	0.00	1.86	4.90	0.00	9.52	22.73

Notes: Values for Headcount (H), poverty gap (PG) and squared poverty gap (SPG) are obtained from micro-simulations as described in the text. Percentage decreases in the lower panel are computed using values in the upper panel of the table.

Table 3.6: Coefficient and standard error estimates from probit models of school enrollment for children aged 6-17 in households in the lowest three deciles of the consumption distribution, by country

	Malawi	Mozambique	Zambia	Uganda
Log(per capita consumption)	**0.417**	**0.168**	0.037	**0.569**
	(0.105)	(0.075)	(0.027)	(0.148)
Age 6-14, spline	**0.133**	**0.131**	**0.213**	**0.135**
	(0.010)	(0.010)	(0.007)	(0.013)
Age 15-17, spline	**-0.34**	**-0.29**	**-0.231**	**-0.48**
	(0.019)	(0.021)	(0.014)	(0.036)
Female	0.017	**-0.134**	0.024	-0.018
	(0.041)	(0.041)	(0.025)	(0.045)
Maternal orphan	**-0.227**		0.08	-0.034
	(0.101)		(0.102)	(0.134)
Paternal orphan	0.006		**0.174**	-0.107
	(0.068)		(0.053)	(0.084)
Double orphan	-0.055		-0.043	**-2.901**
	(0.093)		(0.087)	(0.177)
HH head completed primary	**0.548**	**0.247**	**0.186**	**0.168**
	(0.092)	(0.069)	(0.044)	(0.075)
HH head completed secondary	**1.052**	0.208	**0.45**	**0.298**
	(0.499)	(0.108)	(0.066)	(0.127)
Log(household size)	**0.291**	0.085	**0.364**	**0.2**
	(0.090)	(0.069)	(0.050)	(0.076)
urban	**0.336**	0.129	**0.14**	0.003
	(0.146)	(0.090)	(0.049)	(0.088)
Observations	5,804	4,734	10,391	4,542

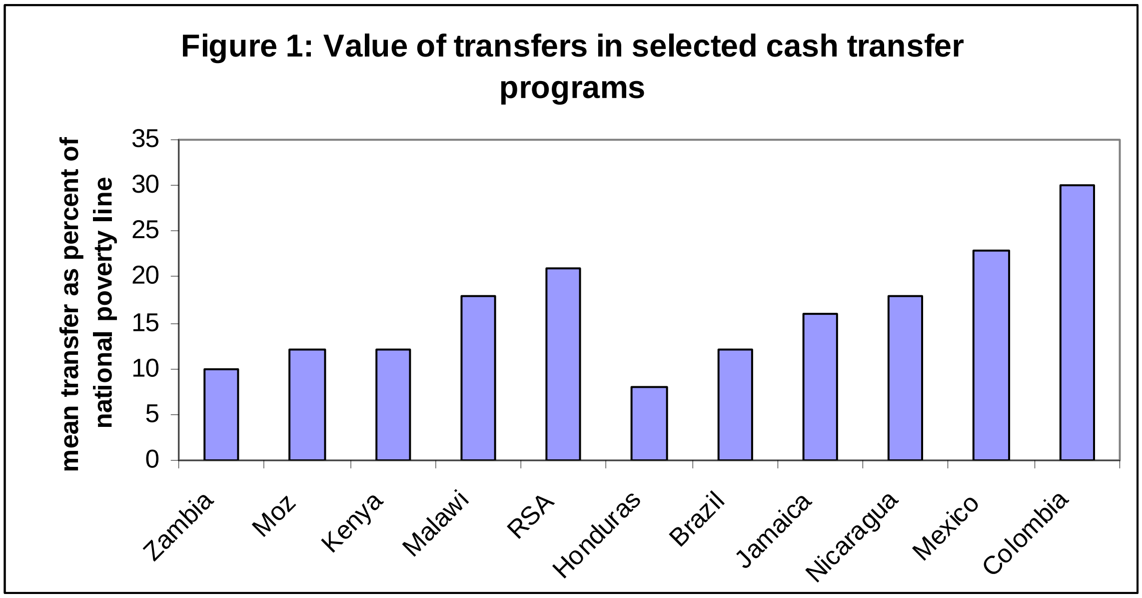
Notes: Coefficient estimates in bold are statistically significant at 0.05. Robust standard error estimates are presented in parentheses. Estimates on time to travel to school (available from author) are omitted from the table.

Table 3.7: Predicted probability of school enrollment and change in probability by age, country and targeting scheme

	Proportion enrolled at baseline, by age			Proportion enrolled with transfer, by age			Percentage point increase with transfer		
	Age 6-17	Age 6-13	Age 14-17	Age 6-17	Age 6-13	Age 14-17	Age 6-17	Age 6-13	Age 14-17
Malawi	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
labor-constrained HHs	0.757	0.761	0.683	0.797	0.801	0.728	4.05	4.03	4.55
HHs w/elderly | disabled	0.752	0.780	0.680	0.787	0.814	0.718	3.48	3.35	3.83
HHs w/children	0.715	0.736	0.644	0.765	0.785	0.697	4.96	4.87	5.27
HHs w/orphans	0.730	0.759	0.651	0.772	0.799	0.697	4.18	4.01	4.61
poorest households	0.715	0.736	0.644	0.765	0.785	0.697	4.96	4.86	5.27
Mozambique									
labor-constrained HHs	0.646	0.652	0.616	0.662	0.668	0.631	1.54	1.55	1.50
HHs w/elderly | disabled	0.606	0.628	0.550	0.625	0.647	0.570	1.90	1.87	1.99
HHs w/children	0.584	0.600	0.539	0.610	0.626	0.565	2.56	2.55	2.60
HHs w/orphans									
poorest households	0.581	0.598	0.535	0.607	0.623	0.561	2.59	2.57	2.62
Zambia									
labor-constrained HHs	0.645	0.619	0.719	0.649	0.623	0.722	0.36	0.38	0.30
HHs w/elderly | disabled	0.641	0.620	0.690	0.645	0.624	0.693	0.36	0.37	0.34
HHs w/children	0.615	0.590	0.680	0.620	0.596	0.685	0.52	0.52	0.50
HHs w/orphans	0.664	0.642	0.711	0.668	0.646	0.714	0.34	0.35	0.33
poorest households	0.612	0.587	0.679	0.618	0.593	0.685	0.55	0.56	0.53
Uganda									
labor-constrained HHs	0.807	0.805	0.826	0.848	0.847	0.860	4.11	4.17	3.37
HHs w/elderly | disabled	0.802	0.809	0.785	0.841	0.848	0.826	3.93	3.86	4.09
HHs w/children	0.755	0.762	0.735	0.814	0.822	0.792	5.94	6.01	5.75
HHs w/orphans	0.758	0.769	0.729	0.813	0.824	0.784	5.47	5.46	5.49
poorest households	0.752	0.759	0.734	0.813	0.820	0.792	6.04	6.11	5.81

The change in column (7) is the difference between columns (4) and (1); the change in column (8) is the difference between columns (5) and (2); the change in column (9) is the difference between columns (6) and (3).

Figure 3.1: Value of transfers in selected cash transfer programs



Source: Taken from UNICEF-ESARO (2008)

Figure 3.2: Percent of children and orphaned reached in Malawi

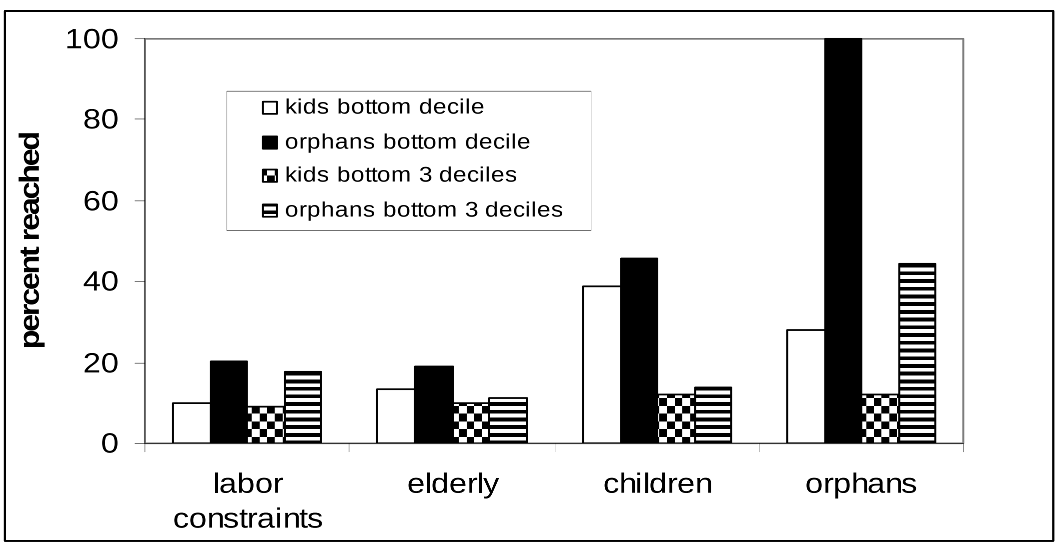


Figure 3.3: Percent of children and orphaned reached in Zambia

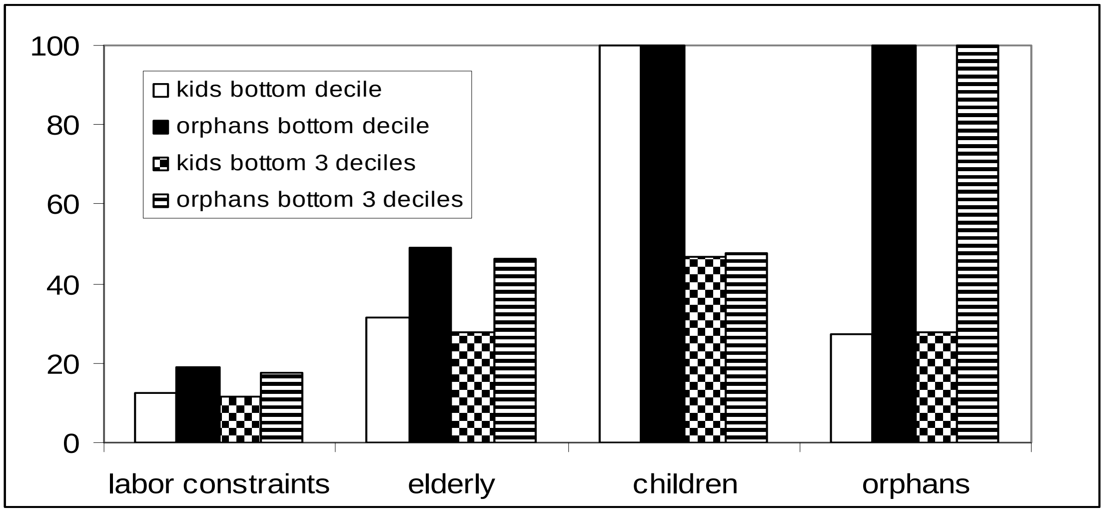


Figure 3.4: Percent of children and orphaned reached in Uganda

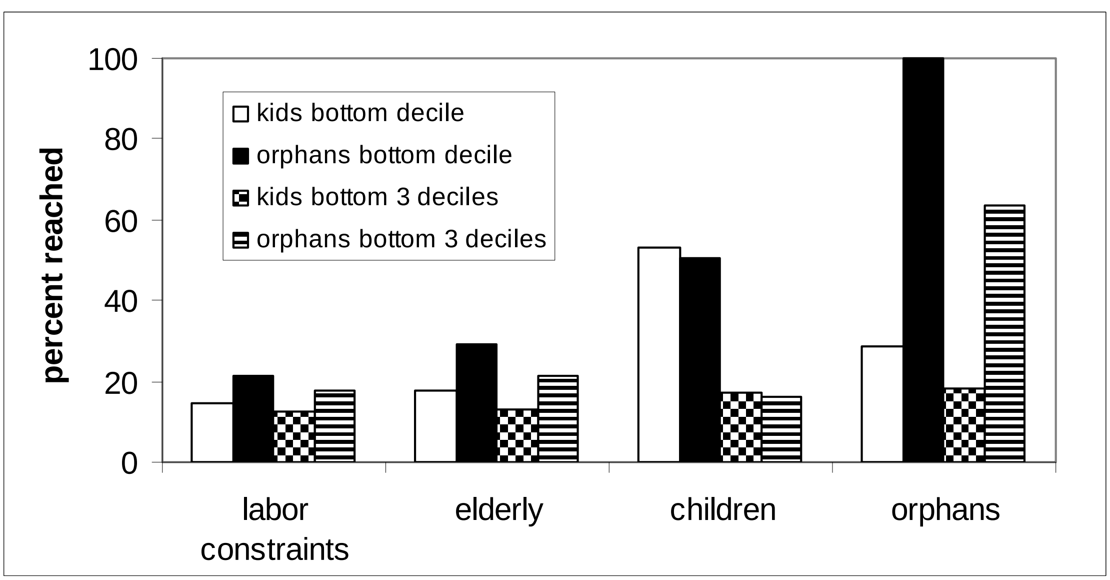


Figure 3.5: Poverty impacts of alternative targeting schemes in Malawi

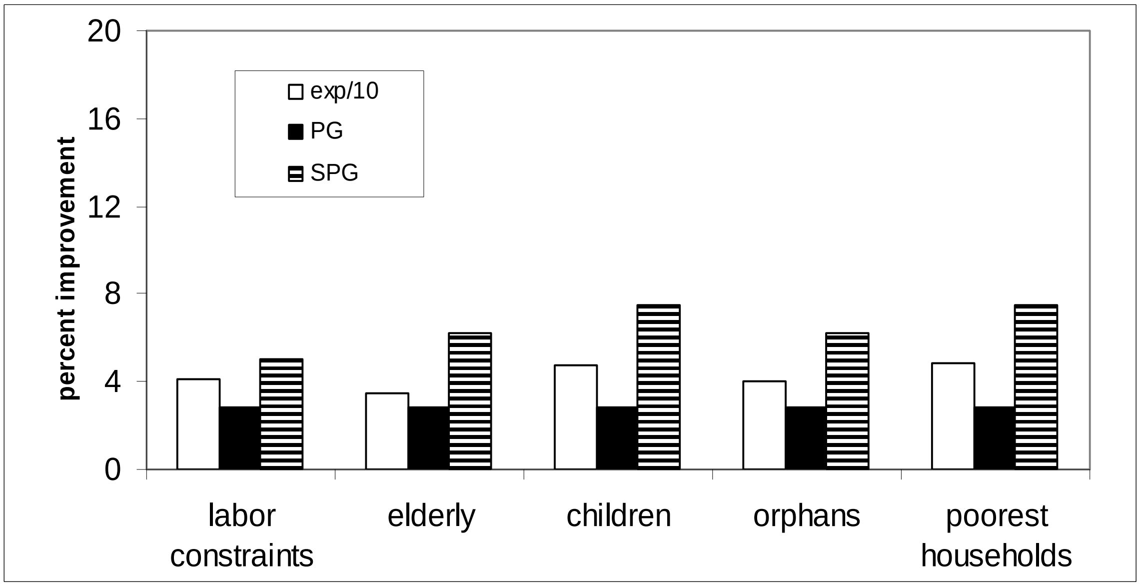


Figure 3.6: Poverty impacts of alternative targeting schemes in Zambia

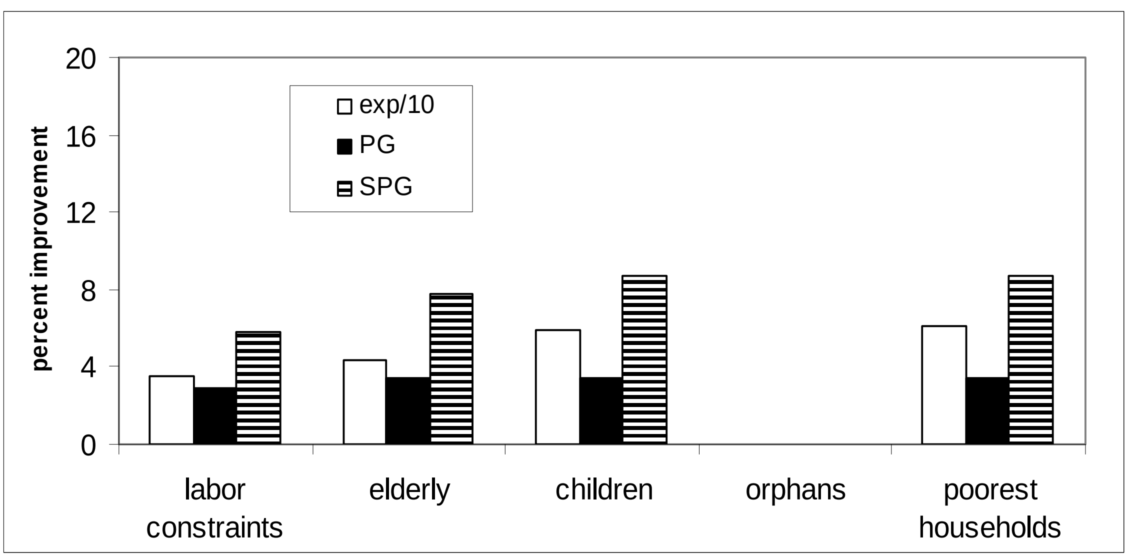
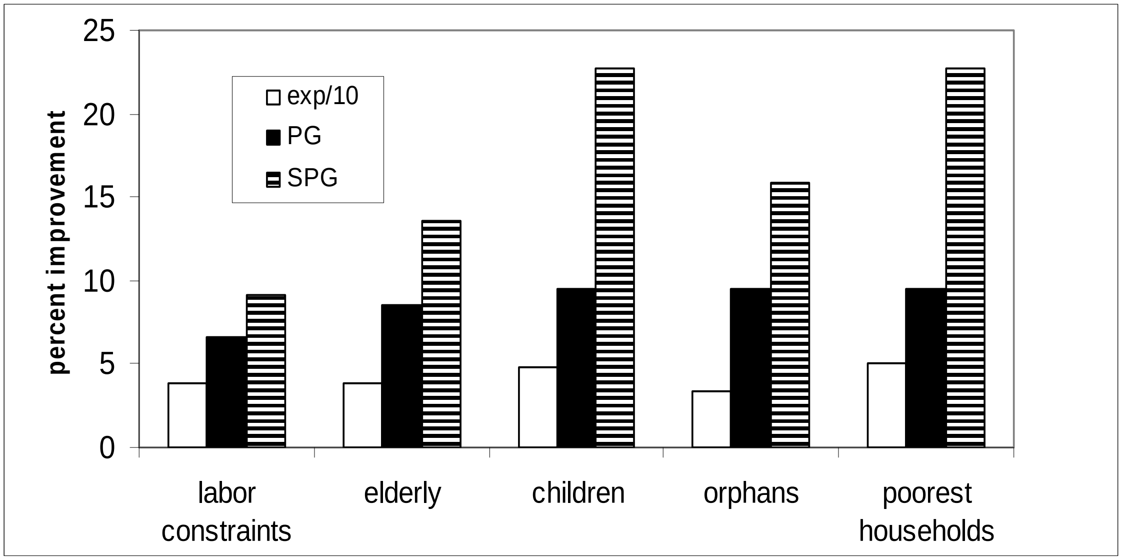


Figure 3.7: Poverty impacts of alternative targeting schemes in Uganda



CHAPTER IV: COMPARING THE POVERTY EFFECTS OF UNIVERSAL CASH GRANTS FOR CHILDREN AND THE ELDERLY: SIMULATION ANALYSES FROM FOUR COUNTRIES IN SUB-SAHARAN AFRICA

Introduction

Universal cash grants are a form of social cash transfers (CTs) that provide small predictable sums of money to households that include vulnerable individuals such as children or the elderly. These CTs represent a relatively new social protection instrument in Eastern and Southern Africa. As opposed to targeted CTs, which tend to focus resources on poor households with residents exposed to particular vulnerabilities, universal cash grants extend benefits to all households that include vulnerable individuals regardless of income. South Africa has had a universal old-age pension (OAP) and child support grant (CSG) for over a decade, and OAPs exist in Lesotho, Botswana and Namibia. Targeted CTs to vulnerable groups exist in a number of countries including Mozambique, Ethiopia, Namibia, and Rwanda, and smaller scale government programs exist, or are getting under way, in Kenya, Malawi, Ghana, Lesotho and Zambia. Several other countries are currently considering implementing CTs on a trial basis including Tanzania, Angola and Uganda.

As universal cash grants and CTs more generally gain traction in Africa, there is considerable debate regarding appropriate targeting strategies, particularly with regard to the benefits that accrue to orphans and other vulnerable children (OVC). CSGs are advocated to provide immediate benefits for children by directly targeting households with children. Proponents of OAPs advocate that OAPs confer benefits on children including OVC directly through their residence in beneficiary households, and indirectly through the fertility effects of ensuring old-age security. While the ideal may a combination of CSG and OAP, budget constraints may require progressive implementation of these alternatives, begging the question of which group to target first.

This analysis seeks to inform the current debate by providing comparative projections of the poverty effects of CSGs and OAPs in four countries in sub-Saharan Africa. It uses data from nationally representative household consumption surveys to conduct microsimulations of the poverty effects of six alternative targeting strategies for universal cash grants. Cash grants are new to the region and panel data exist only from small area interventions. Small area analysis may misinform decisions regarding national scale-up if there is significant variation within country. Thus, microsimulation can provide useful information to policy makers in resource-poor environments in advance of difficult and competing policy choices.

Background

The case for CTs in East and Southern Africa has been made from three perspectives: the HIV and AIDS policy dialog; the fostering of economic development via the building of human capital and household productive investment; and a human-rights based approach. In the HIV and AIDS policy dialogue, the ‘protective’ dimension of programming increasingly calls for the use of social cash transfers to support families that care for orphans and other children affected by AIDS (UNICEF & UNAIDS 2004; Adato & Bassett 2007). Advocacy for such programs is driven by the fact that AIDS is the number one cause of prime-age mortality in sub-Saharan Africa, and the region hosts approximately 25-30 million orphans, one third of whom have lost a parent to the disease. AIDS related prime-age adult mortality has led life expectancy rates to decline dramatically in the region and has severely weakened family support systems already stretched thin by extreme chronic poverty. In this context, CTs are increasingly being called for as an AIDS mitigation measure, to help families cope with increasing dependency ratios and the associated burden of care, and to protect the health and human capital development of orphans and other vulnerable children (OVC).

Social cash transfers, targeted or universal, conditional and unconditional, have rapidly gained popularity in developing countries as a way to mitigate current poverty and food insecurity and to break the inter-generational cycle of poverty by allowing families to invest in the human capital of their children. This approach to social protection in developing countries began in the 1990s when three influential countries, Brazil, Mexico and South Africa began distributing cash to poor families. The Mexican program, a conditional cash transfer (CCT), had a particularly large effect on global anti-poverty policy primarily because of the results of a large-scale social experiment which demonstrated significant positive impacts on beneficiaries across a range of outcomes including health and nutrition (Gertler 2004), food security (Hoddinott & Skoufias 2005) and schooling (Schultz 2004). Based on these results, the World Bank and Inter-American Development Bank began advocating aggressively for CCTs in Latin America and the Caribbean and other middle-income countries. Since 2000 CCTs have been developed in Colombia (Famílias en Acción), Costa Rica (Superémonos), Jamaica (Poverty Alleviation through Health and Education), Paraguay (Tekopora) and Turkey (Social Solidarity Fund), among others.

The evidence on CCTs demonstrates that beyond reducing poverty and helping vulnerable families cope with adversity, CTs support the construction of human capital of today's children, particularly via improved health status and educational obtainment, which will lead to improved earnings in the future. CTs facilitate both improved access and improved utilization of health and educational services. Moreover, CTs also have significant impacts on economic development, both at the household level in terms of investment in productive activities, but also in terms of multiplier effects on the local economy.

The existing evidence on the impact of unconditional transfers on children's welfare is more sparse and mixed, and there is no experimental evidence to date. Aruejo, Carter & Woolard (2007) report significant impacts of the CSG on child height using a sample of children from KwaZulu Natal. Heinrich, Samson & Regalia (2008) show significant increases in school enrolment due to the CSG using a robust non-experimental method. Duflo (2003), however, shows that unconditional pension transfers to elderly women in South Africa have a bigger impact on girls' nutritional status than similar transfers given to men. Hence, unconditional CTs have the potential to promote children's human capital development (see also Stewart & Handa forthcoming) and tend to be the model followed in African countries where household income constraints are more binding and for reasons of social protection.

A final argument for CTs lies in the notion that social protection ought to be part of the basic package of services, or social minimum, that governments are obliged to provide to their citizens to ensure a minimum acceptable standard of living. The 'rights-based approach' to social protection points out that access to social protection is explicitly mentioned in the international covenants that African countries are state parties to, including the Universal Declaration on Human Rights, the Convention on the Rights of the Child, and the African Charter on the Rights and Welfare of the Child. Universal grants of the kind envisioned in these covenants, primarily old age pensions, currently exist in the relatively well-off countries in Southern Africa, including South Africa, Lesotho, Botswana and Namibia, and form part of the policy discussion in many other countries of the region.

As momentum gathers around CTs, technical questions arise regarding program design parameters such as targeting, transfer levels, and overall costs and affordability. From a rights-based perspective and given limited budgets, two obviously vulnerable but distinct groups have dominated the policy dialogue: the elderly and children. Targeted CTs often have focused on child vulnerability and orphan hood in particular, directing resources to households that are thought to contain vulnerable children, e.g. in Kenya, Malawi, and Namibia. Universal social grants on the other hand have tended to focus on the elderly with the sole exception of South Africa, which provides universal grants to both groups. The human rights approach to programming acknowledges that rights may be realized progressively, and advocates that such progressive realization begin with the most marginalized. Thus, a key decision faced by policy makers in the face of limited budgets and competing interests is which of these two vulnerable groups to target first.

The debate regarding appropriate targeting strategies, particularly the extent to which benefits accrue to OVC, is largely a conceptual one in which the evidence brought to bear is both limited and mixed. Kidd (2009) argues that OAPs yield benefits for children by ensuring old-age security, which can result in greater investment of parents' prime-age earnings in their children's human capital development and, in the long-term reduce fertility as OAPs substitute for parents' dependence on their children's support in old age. Others have argued that a large share of the responsibility for OVC care is borne by the elderly, and particularly that OVC frequently live in households that comprise the elderly and children without prime-aged adults in the middle generation (HelpAge International & the International HIV/AIDS Alliance 2003, HelpAge International 2008). However, it is difficult to find these so-called "missing generation" households in nationally representative survey datasets (author's experience); whether this is because the evidence cited is based on small-area studies or because such households are missed in large-survey sampling frames is unclear. Schubert (2007) cites the result of several evaluations to demonstrate that 50-80 percent of households that benefit from OAPs include children. However, Stewart & Handa (forthcoming) show that OAPs may miss a significant portion of OVC. The difference between these studies appears to be in the denominator: Schubert uses as a denominator the set of beneficiaries; Stewart and Handa the universe of potential beneficiaries under alternative strategies.

Methods

This paper compares the performance of CSGs and OAPs on a number of key decision criteria from a welfare economics perspective. Using national household survey data and micro-simulations, estimates are provided of the cost, number of recipients, and poverty impacts of OAPs and CSGs in four countries: Kenya, Malawi, Mozambique and Uganda. A key criterion is the progressiveness of the benefits realized under the alternative programs, i.e., the extent to which individuals in poorer households benefit relative to their baseline consumption levels as compared to individuals that are better off. The analysis relies on average effects – within households for changes in per capita consumption and across the population for the poverty indicators – intrahousehold resource allocation decisions are not modeled, so the question of which individual in the household to provide the transfer is not addressed. Rather, the assumption is that the benefits accrue to the household and are evenly distributed, on average, among the household's residents.

Nationally representative household expenditure surveys from four Eastern & Southern Africa countries are used to compare the costs, reach and poverty impacts of alternative universal social grants. Six different social grant schemes are assessed. For CSGs, grants are simulated grants for three age categories (age 5 and under, age 10 and under, and age 17 and under), while for the OAP I also simulate grants for three different age categories (age 70+, age 65+ and age 60+). Microsimulations of each strategy in each country yields results relative to a baseline assumption of having no program; comparison of the results across schemes allows inferences to be drawn regarding the performance of each program against specific policy objectives. The policy objectives of interest are the total cost of the scheme and the welfare impact – the distribution of benefits and relative increases in consumption. Indirect beneficiaries are defined as individuals who reside in a household that receives a grant but is not directly targeted by the grant assistance, e.g. prime-aged adults who live in a household with a child under a CSG or an elderly relative under an OAP. Indirect beneficiaries are important to the assessment of program performance: since the cash grant is given to the household and not to the individual directly targeted by the grant, the grants have broader welfare impacts than would be captured by a simple count of the targeted individuals.

Program parameters

A social grant must strike a balance between providing sufficient resources to pursue a policy objective and avoiding distortion of consumption patterns. In this study, the daily per person transfer level is set at ten percent of the national (daily) poverty line. This is considered to be a "low transfer scenario;" other analyses have experimented with 15 percent and 20 percent transfer levels, which essentially inflate costs proportionately but have larger poverty impacts. Other analysis (UNICEF-ESARO 2008) indicates that average transfer levels for CT programs in Latin America and Africa, as a percentage of the national poverty line, range from about 20-30 percent in the relatively richer Latin American countries down to about 10-15 percent in the Africa programs. The UNICEF study further notes that because the targeted CT programs in Africa have tended to focus resources on the poorest of the poor whose consumption is half (or less) of the poverty line, those transfers likely represent about 30 percent of the average consumption of recipients, and so are similar in relative terms to the transfer levels in Latin America. Hence placing the transfer value at ten percent of the national poverty line is consistent with both international experience and what is currently occurring in Africa.

While a truly universal grant would be ideal to simulate, in practice 100 percent coverage is unlikely due both to demand and supply side constraints. On the demand side, the wealthiest households may not sign up for the grant; supply side constraints include administrative capacity to implement the program. The grant is restricted to households with eligible individuals in the bottom eight deciles of the *per capita* consumption distribution, thus excluding the wealthiest two deciles. Supply side constraints are more likely to affect the poorest deciles rather than the richest, but operational efficiency is assumed here to examine expected outcomes under the best case scenario. The poverty effects estimated under this best case scenario, as argued below, result in an exaggeration of the relative performance of the OAP since the elderly are more likely to be in the top two deciles relative to children in the countries under study. Finally, the total grant to the household is capped at the sum of three individual transfers, i.e., no household can receive more than three grants. Capping the total grant recognizes potential economies of scale in consumption at the household level, the reality of the budget constraint and the need to assure wide coverage of the program. In practice, limiting the number of grants per household would avoid perverse fertility incentives under a CSG. This assumption understates the relative poverty impact of a truly universal CSG because children are more likely to live in households with more than two other children, while pensioners rarely live in households with more than two other pensioners.

Efficiency of alternative targeting strategies

Upon identification of recipient households and the number of eligible individuals in each household, the total number of individuals who would benefit from the grant is estimated using household or population weights, as appropriate. These results are used to estimate changes in the poverty headcount ratio (H), poverty gap ratio (PG), and squared poverty gap ratio (SPG) that would result from a specific targeting strategy. These measures are calculated by the following formulas (Foster, Greer and Thorbecke, 1984). The headcount poverty ratio measures the proportion of the population living below the poverty line:

$$H = \frac{\sum h_i}{\sum i} \tag{1}$$

where *i* represents individuals in the population and *h* individuals with *per capita* consumption below the poverty line. Summations for all three measures are over *i*, or across the population represented by the household sample. In practice, these measures are derived using population weights calculated as the product of household size and sample household weight. The poverty gap ratio, which measures the proportional difference between *per capita* consumption and the poverty line for those in poverty, is calculated by:

$$PG = \sum\left[h_i * \frac{(povline - pc_i)}{povline}\right] \tag{2}$$

where *povline* is the poverty line in each country, expressed in local currency, and *pc* is *per capita* consumption for the individual *i*. Finally, the squared poverty gap ratio is:

$$SPG = \sum\left[h_i * \frac{(povline - pc_i)}{povline}\right]^2 \tag{3}$$

By squaring the difference between *per capita* consumption and the poverty line, SPG places greater emphasis on the welfare of individuals in the poorest households. A decrease in any of the three measures represents an improvement in poverty. PG and SPG are important measures to take into account. In targeted cash transfer programs the transfers often are not enough to move a household over the poverty line, but do reduce the distance from the poverty line. While changes in the poverty headcount ratio will be observed under universal cash grant programs, PG and SPG provide measures of the progressiveness of alternative programs as they indicate the impact on the poorest of the poor.

The progressiveness of each scheme is an important criterion for policy-makers and development partners when deciding among alternative grants that can be justified on human rights grounds. The performance of alternative targeting strategies also is assessed by estimating the mean increase in consumption of all beneficiaries, in sum and by wealth decile, and the share of recipient households in the bottom three deciles of the *per capita* consumption distribution. Ceteris paribus, policy makers and development partners should be interested in implementing a program whose benefits are more progressively distributed, thus reducing inequality and poverty by more than alternative, less progressive programs.

Data and summary statistics

Data

Household income and expenditure surveys from Kenya, Malawi, Mozambique and Uganda and Zambia are used for this analysis. Specifically, they are the Kenya Integrated Household Budget Survey (2005-06); the Second Integrated Household Survey (IHS) from Malawi (2004); the *Inquerito aos Agregados Familiares* 2002-03 (IAF) from Mozambique; and the Uganda National Household Survey (UNHS) (2005-06). These surveys are similar in structure; they are cross-sectional in nature and support nationally representative analysis.

The policy variable of interest in these analyses is *per capita* consumption, calculated as the household's aggregate consumption divided by household size. Although receipt of a cash transfer represents an increase in income, use of the consumption variable helps to avoid problems associated with underreporting of income and measurement of household production. The household consumption aggregates employed are those calculated by the national statistics offices that manage the surveys. Consumption aggregates are adjusted for local prices, so that the purchasing power of equal consumption levels is equivalent across sample clusters within country. *Per capita* consumption is used to calculate the population-weighted decile rank of individuals.

Descriptive analysis

Descriptive statistics for the data supporting the analysis are presented in Table 1. Though one cannot compare poverty lines and, hence, poverty rates between countries directly, due to differences that may exist in the consumption basket used to calculate poverty lines, these data offer some useful comparisons across country and may have some predictive value regarding the comparative results of the analysis.

Total GDP is much higher in Kenya at USD 24 billion than in the other three countries. Malawi's GDP is USD 3 billion; Mozambique's is USD 6 billion and Uganda's is USD 10 billion. These figures are in 2007 USD and are calculated by inflating the local currency GDP figure at the time of the survey year by the local price index (IMF 2009), and then converting to USD at the 2007 exchange rate (OANDA 2009). Kenya's poverty line represents consumption of about one dollar per day, while the other three countries all have poverty lines of approximately half that. Similarly, *per capita* consumption in Kenya, USD 36, is twice that of the other countries, which all have *per capita* consumption levels around USD 18. Kenya experienced strong economic growth in the middle years of this decade, but this is projected to level off sharply in 2008 and 2009, possibly because of political conflict. As of April 2009, the other countries' economies were expected to continue at recent rates.

Examination of the baseline poverty indicators suggest that larger numbers of the poor will benefit from transfers under universal grants in Malawi and Mozambique than in the other two countries in this study, but this is misleading due to variation in population size. Mozambique has the highest poverty headcount ratio (H = 0.54) and the highest squared poverty gap ratio (SPG = 0.10): not only does a larger proportion of the population live below the poverty line in Mozambique, but the gap between *per capita* consumption and the poverty line is greater in Mozambique for the poorest individuals. Malawi's poverty indicators are similar. However, the countries with the lower poverty headcount ratios, Kenya and Uganda, also have substantially larger populations. Approximately 16.3 million people live below the poverty line in Kenya and 10.1 million in Uganda, as compared to 6.4 million and 9.9 million in Malawi and Mozambique, respectively.

Table 2 reports sub-group rates for the six demographic groups considered in this paper. First, for all countries, the incidence of poverty is higher in households with children then in households with elderly residents. Second, in all countries except Kenya, households with elderly residents have a lower incidence of poverty then the average household; for all countries, the incidence of poverty in households with children is greater then the average. Further, in Kenya and Malawi, the incidence of poverty increases as larger groups of children are considered (0-5 to 0-17) and, with the addition of Mozambique, poverty rates decrease as larger groups of the elderly are considered (70+ to 60+). These findings suggest that targeting children with universal cash grants will have a greater poverty effect than targeting the elderly.

Results

Key criteria that decision makers would consider are the budget implications and welfare impacts. Welfare impacts are assessed in terms of the progressiveness of benefits – their distribution and relative increases in consumption – and poverty effects. Table 3 reports the number of beneficiary households, the number of individuals targeted, and budget requirements under each social grant. Table 4 reports coverage data.

Differences in the budget implications between the CSG and OAP are stark, but the total cost of the most liberal program is not impossible. Universal CSGs require resources nearly an order of magnitude greater than those required by universal OAPs (Table 3, column 5). For example, in Kenya a 0-17 CSG would cost USD 405 million, while a 60+ OAP would cost USD 65 million. In Malawi these figures would be USD 78 million and USD 10 million, respectively. Still, only 1.6 to 2.6 percent of GDP is required to fund the 0-17 CSG (Table 3, column 6). The proportion of GDP required to fund a 60+ OAP, at 0.2-0.34 percent, is considerably less than the generally accepted budget for *targeted* CTs of 0.5 percent of GDP, suggesting that OAPs make insufficient use of the available fiscal space.[5]

There are clear differences in the proportions of households that would receive transfers under alternative social grant scenarios. In three of the countries – the exception is Kenya – the most inclusive CSG would reach about two-thirds of all households in these countries (Table 3, column 4), and virtually every single household in the bottom three deciles of the national consumption distribution (Table 4, column 4); the 0-17 CSG is thus strongly progressive in its distribution of benefits. More restrictive CSG schemes (0-5, 0-10) reach fewer households altogether, and a smaller share in the bottom three deciles, though the difference between the 0-10 and 0-17 CSG is not large. The OAP is less progressive. The most inclusive (60+) OAP reaches only 15-18 percent of all households (Table 3, column 4), and only 20-30 percent of households in the bottom three deciles (Table 4, column 4). These findings are in keeping with the position in the

[5] Chapter 2 of the dissertation explores the effects of CTs under a fixed budget tied to GDP.

consumption distribution of households containing elderly – households with elderly members tend to be wealthier on average, as measured by *per capita* consumption, than households with children.

Further evidence of the relative progressiveness of CSGs is provided through comparison of columns 1 and 2 in Table 4. These results indicate that households with children are significantly larger than those containing elderly members and tend to have a higher number of targeted members. The average number of grants to a recipient household under a CSG approaches 2.5 for the 0-17 CSG, compared to about 1.2 for the 60+ OAP. Simple subtraction across columns indicates that the OAP households have more non-targeted members than CSG households, so the total number of indirect beneficiaries may be larger under an OAP than under a CSG that benefits the same number of households. However, the increase in *per capita* consumption (Table 4, column 3; and Appendix A) clearly indicates greater welfare increases for individuals in CSG households than for those in OAP households, with proportional increases in *per capita* consumption ranging 73-100 percent higher for the 0-17 CSG than for the 60+ OAP.

One argument put forth by advocates for social pensions is that the elderly are often responsible for raising children, especially when prime-age mortality is high due to AIDS, thus social pensions provide substantial benefits to children, particularly orphans. This proposition is examined in the last three columns of Table 4 (see also Appendix C). Indeed, 70-80 percent of households with a member aged 60+ also contain at least one child under age 18. In contrast, only about 18% of households with a child under 18 also contain an elderly person age 60+. Hence, while the majority of households eligible to receive an OAP would have a resident child, many children – and many vulnerable children given the difference in the consumption distribution of beneficiary households – would be missed under an OAP that would otherwise receive benefits under a CSG. In particular, approximately 80 percent of orphans would be covered under a 0-17 CSG, but only a quarter of orphans would benefit under a 60+ OAP (results not shown). Since orphans tend to be evenly distributed across consumption deciles in the study countries, 80 percent coverage includes all orphans in eligible households.

The poverty effect of each type of social grant is reported in Table 5. The top panel shows baseline and estimated levels of each indicator while the bottom panel reports the percentage change from the baseline. The results are not surprising given evidence provided so far regarding the budget requirements for each type of grant and the distribution of beneficiaries. In each country, a CSG would reach more households and individuals given the demographic structure of these countries, and would reach more households in the poorer deciles since child poverty rates are higher than elderly poverty rates. Thus, the poverty impacts of a CSG are far greater than those from an OAP. A CSG would have the largest poverty impacts in Kenya and the smallest in Mozambique. In Kenya for example, the 0-17 CSG would reduce H, PG and SPG by 7.6%, 14.1% and 19.8% respectively. In Mozambique, the comparable figures are 4.6%, 10.7% and 15.5% respectively. The impacts for Malawi and Uganda fall between these two ranges. On the other hand, the most inclusive OAP (60+) also would have its largest poverty impact in Kenya, but now the reductions in H, PG and SPG are 1.1%, 2.5% and 3.7% respectively. Recall that the cost (and number of recipients) for the OAP is about one-twelfth (or 8%)

that of the CSG; the relative welfare impact of the OAP tends to be one-seventh that of the CSG, though there is some variation across countries and specific indicators.

Discussion and Policy Implications

Social protection has become an increasingly important part of the social policy dialogue in sub-Saharan Africa, largely in response to the social costs of HIV/AIDS. Economists argue that social protection can contribute directly to growth, by addressing market failures such as imperfect credit markets, by reducing inequality and thus crime and violence, which can affect entrepreneurship and business climate. Human rights activists argue that social protection ought to be part of the basic package of services that governments provide for citizens, and that state parties have committed to ensuring a minimum standard of living to its most marginal and vulnerable citizens through the Universal Declaration on Human Rights, the Convention on the Rights of the Child, and related covenants. Children and the elderly are oft-cited examples of vulnerable groups that should be afforded a social grant. With limited budgets, a key question is to whom governments should first extend social protection? This paper provides useful comparative analysis regarding the costs and potential benefits of a CSG and OAP using data from four countries in East and southern Africa. The results point to some very clear differences in both costs and the welfare gains under these alternative schemes.

Holding the size of the grant constant, a CSG will cost significantly more than an OAP due primarily to the demographic structure of African countries: there simply are more children than elderly. But the age of individuals is strongly correlated with poverty, and children are far more likely to live in poor households than the elderly in these four countries. Consequently, the most inclusive CSG, covering children aged 0-17, will reach almost all households in the poorest three deciles while the most inclusive (60+) OAP will reach only a fifth to a quarter of households in the poorest three deciles. The result is that the overall poverty impact of a CSG is much greater than that of an OAP.

Advocates of OAPs argue that OAPs reduce fertility incentives by providing old-age security and this, in the long term, contributes to child welfare. However, the near term development impact of the CSG via improved health, dietary and nutritional status and educational attainment for children would be both more substantial and more immediate than the impact from the OAP, again given the age structure of beneficiary households, as well as the age-specific life expectancy of the target group.

OAP advocates argue further that OAPs will benefit children since the elderly are increasingly caring for children due to prime-age mortality caused by AIDS. However, this analysis shows that a much larger proportion of children (80%) may be missed under an OAP than the proportion of elderly who would be missed (25%) under a CSG (see Table 4, columns 6&7, and Appendix C). Moreover, the simulation results indicate much stronger welfare effects from programs that target households with children. Hence, the trade-offs between the two programs, both in terms of numbers of beneficiaries and poverty effects, favor initiating progressive implementation of CTs for social protection through a CSG.

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Tables and Figures

Table 4.1: Summary statistics, by country

	Kenya 2005/6	**Malawi** 2004	**Mozambique** 2002/3	**Uganda** 2005/6
Poverty analysis				
Population (million)	35.5	12.2	18.3	30.0
GDP (2007 USD billion)	24.57	3.02	6.02	10.34
Poverty line, monthly (USD)	29.78	14.24	14.07	14.19
Per capita consumption, monthly (USD)	35.65	18.61	17.97	18.12
Baseline poverty indicators				
Poverty headcount ratio	0.459	0.524	0.541	0.351
Poverty gap ratio	0.163	0.178	0.205	0.105
Squared poverty gap ratio	0.081	0.080	0.103	0.044
Household size (mean)	5.1	4.5	4.8	5.3
Households in sample	13,158	11,280	8,700	7,421
Price inflator 2007:survey year	1.083	1.466	1.547	1.081
USD Exchange rate 2007	67	139	27	1701

Notes: Gross domestic product values obtained from the IMF (2009). Summary statistics for the poverty analysis are computed using population weights derived from household weights and household size. Monetary data are given in USD 2007.

Table 4.2: Poverty headcount ratio by target group

		Children			Adults		
	All	0-17	0-10	0-5	60+	65+	70+
Kenya	0.459	0.507	0.498	0.479	0.498	0.503	0.501
Malawi	0.524	0.582	0.584	0.558	0.494	0.493	0.489
Mozambique	0.541	0.582	0.595	0.597	0.480	0.499	0.500
Uganda	0.351	0.380	0.395	0.394	0.331	0.324	0.312

Table 4.3: Number of beneficiaries and budget requirements under alternative grant schemes

	households reached	Individuals targeted	Share of all individuals targeted (%)	Share of all households reached (%)	Total Cost (2007 USD)	Total Cost as Percent of GDP
	(1)	(2)	(3)	(4)	(5)	(6)
Kenya						
children 0-5	3,017,478	5,052,424	14.23	43.24	202,152,240	0.82
children 0-10	3,803,646	8,062,356	22.71	54.51	315,352,160	1.28
children 0-17	4,383,840	10,467,840	29.49	62.82	405,475,680	1.65
adults 70+	653,417	733,296	2.07	9.36	30,880,088	0.13
adults 65+	948,027	1,106,245	3.12	13.59	46,315,900	0.19
adults 60+	1,273,150	1,561,255	4.40	18.25	64,902,840	0.26
Malawi						
children 0-5	1,308,372	2,092,291	17.15	48.57	40,222,308	1.33
children 0-10	1,617,553	3,428,108	28.10	60.05	64,104,068	2.12
children 0-17	1,783,434	4,214,405	34.54	66.21	78,106,448	2.59
adults 70+	213,433	247,597	2.03	7.92	4,960,096	0.16
adults 65+	298,483	360,401	2.95	11.08	7,178,233	0.24
adults 60+	410,479	519,769	4.26	15.24	10,284,094	0.34
Mozambique						
children 0-5	1,924,141	3,220,018	17.60	50.52	61,398,560	1.02
children 0-10	2,333,169	5,035,773	27.52	61.26	93,718,248	1.56
children 0-17	2,545,344	6,145,387	33.58	66.83	113,340,192	1.88
adults 70+	238,100	260,636	1.42	6.25	5,250,290	0.09
adults 65+	374,051	437,127	2.39	9.82	8,719,436	0.15
adults 60+	597,038	719,328	3.93	15.68	14,285,529	0.24
Uganda						
children 0-5	2,729,051	5,021,082	16.74	52.19	97,556,808	0.94
children 0-10	3,231,252	7,479,942	24.93	61.79	142,407,200	1.38
children 0-17	3,528,482	8,989,910	29.97	67.48	169,910,304	1.64
adults 70+	425,091	467,495	1.56	8.13	9,682,507	0.09
adults 65+	620,971	709,487	2.36	11.88	14,609,808	0.14
adults 60+	829,522	985,612	3.29	15.86	20,179,708	0.20

Notes: Results presented are from analysis of the full household sample, using population weights.

Table 4.4: Numbers of beneficiaries under alternative targeting strategies by country

	Mean size of recipient households	Transfers per recipient household	Increase in consumption of recipients (%)	Coverage of households in bottom 3 deciles (%)	Coverage of orphans (%)	Recipient household has resident age 60+ (%)	Recipient household has resident age <18 (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kenya							
children 0-5	6.05	1.67	6.17	49	50	15	-
children 0-10	5.89	2.12	7.79	60	68	18	-
children 0-17	5.68	2.39	8.93	70	80	20	-
adults 70+	4.66	1.12	4.59	16	11	-	66
adults 65+	4.82	1.17	4.81	22	17	-	68
adults 60+	4.93	1.23	4.92	29	24	-	70
Malawi							
children 0-5	5.54	1.60	4.02	76	50	11	-
children 0-10	5.41	2.12	5.49	92	74	15	-
children 0-17	5.26	2.36	6.20	98	83	18	-
adults 70+	4.46	1.16	3.39	11	13	-	73
adults 65+	4.52	1.21	3.47	15	19	-	76
adults 60+	4.62	1.27	3.58	22	27	-	78
Mozambique							
children 0-5	5.91	1.67	4.63	78		14	-
children 0-10	5.69	2.16	6.07	89		16	-
children 0-17	5.52	2.41	6.88	95		18	-
adults 70+	5.02	1.09	3.48	10		-	69
adults 65+	5.10	1.17	3.76	16		-	74
adults 60+	5.15	1.20	3.74	24		-	77
Uganda							
children 0-5	6.50	1.84	3.14	75	59	13	-
children 0-10	6.33	2.31	4.04	88	74	16	-
children 0-17	6.14	2.55	4.54	94	79	18	-
adults 70+	5.32	1.10	2.15	11	11	-	74
adults 65+	5.31	1.14	2.26	16	16	-	75
adults 60+	5.52	1.19	2.27	21	22	-	77

Orphan information not available in Mozambique IAF data.

Table 4.5: Absolute value and percentage change in poverty indicators for alternative cash grants

	Kenya			Malawi			Mozambique			Uganda		
	H	PG	SPG	H	PG	SPG	H	PG	SPG	H	PG	SPG
Targeting Strategy												
Baseline	0.459	0.163	0.081	0.524	0.178	0.080	0.541	0.205	0.103	0.351	0.105	0.044
Children												
Aged 0-5	0.444	0.152	0.073	0.512	0.167	0.072	0.530	0.193	0.094	0.337	0.096	0.039
Aged 0-10	0.434	0.145	0.069	0.502	0.159	0.068	0.520	0.186	0.090	0.329	0.093	0.037
Aged 0-17	0.424	0.140	0.065	0.497	0.156	0.065	0.516	0.183	0.087	0.327	0.091	0.036
Adults												
Aged 70+	0.457	0.161	0.080	0.522	0.177	0.079	0.540	0.204	0.103	0.350	0.104	0.043
Aged 65+	0.456	0.160	0.079	0.521	0.176	0.079	0.539	0.204	0.102	0.350	0.104	0.043
Aged 60+	0.454	0.159	0.078	0.520	0.175	0.078	0.538	0.203	0.101	0.349	0.103	0.043
Percentage decrease from baseline												
Children												
Aged 0-5	3.27	6.75	9.88	2.29	6.18	10.00	2.03	5.85	8.74	3.99	8.57	11.36
Aged 0-10	5.45	11.04	14.81	4.20	10.67	15.00	3.88	9.27	12.62	6.27	11.43	15.91
Aged 0-17	7.63	14.11	19.75	5.15	12.36	18.75	4.62	10.73	15.53	6.84	13.33	18.18
Adults												
Aged 70+	0.44	1.23	1.23	0.38	0.56	1.25	0.18	0.49	0.00	0.28	0.95	2.27
Aged 65+	0.65	1.84	2.47	0.57	1.12	1.25	0.37	0.49	0.97	0.28	0.95	2.27
Aged 60+	1.09	2.45	3.70	0.76	1.69	2.50	0.55	0.98	1.94	0.57	1.90	2.27

Notes: Values for H, PG & SPG are obtained from micro-simulations as described in the text. Percentage decreases in the lower panel are computed using values in the upper panel of the table.

CHAPTER V: CONCLUSION

This research was undertaken to inform our understanding of the social costs of HIV/AIDS, as indicated by potential differences in human capital – health and education – between orphans and non-orphans, and to compare alternative opportunities to mitigate vulnerability. I find that orphans typically are not different from other children in terms of nutritional status. Rather, household wealth and other aspects of household structure are stronger drivers of children's nutritional wellbeing than orphan status. In comparisons of alternative targeting strategies for targeted cash transfer programs and universal cash grants, I find that targeting households with children confers greater benefits on children living in poverty than other targeting criteria that are being considered in southern Africa, including households with old-age residents, households with labor constraints, and households that include orphans.

The research findings are somewhat contrary to *a priori* expectations and the evaluation results of selected pilot cash transfer programs. *A priori* expectations of deficiencies in human capital on the part of orphans as compared to non-orphans are indicated by policies that presumptively target orphans for assistance. Results of the nutrition analysis also are counter to the general sense of the literature that orphans typically experience enrolment and attendance deficits as compared to non-orphans. It is unclear whether my findings regarding nutritional status represent a null direct effect, or they reflect greater propensity of young orphans to be assimilated in fostering households than older ones – in which case human capital deficits may be countered by active childcare, or they reflect differences between patterns of household production of children's nutrition and education.

Results of the cash transfer simulations are appropriately compared to evaluation results from the evaluations of pilot programs in southern Africa. The latter found that OVC benefit substantially through programs that target households with labor constraints or households that host the elderly. The difference is in the denominator: the pilot evaluations cite evidence that OVC comprise a large proportion of beneficiaries under alternative targeting strategies; this research shows that a large proportion of OVC – particularly poor, non-orphan children – would be missed because they do not reside in eligible households under these targeting strategies.

In the context of current policy debates, particularly those regarding the targeting of cash transfers and sources of childhood vulnerability, these findings are important. The findings indicate that orphans are not necessarily different from other children in terms of human capital, and that assistance that targets orphans presumptively is inefficient. Presumptive targeting of orphans can miss substantial proportions of non-orphan children who are vulnerable from poverty, and may extend benefits to orphans who are less in need because they live in wealthier households. Indeed, my findings suggest that the focus should be on children vulnerable from poverty, regardless of orphan status. Further, it is insufficient to assume that vulnerable children will benefit on average from assistance programs that target benefits to the elderly or to households with labor constraints. While evaluation of targeted cash transfer programs that focus on households with elderly residents and labor constraints in pilot areas has found that OVC represent a substantial proportion of beneficiaries, the work presented herein also demonstrates that such targeting strategies miss a substantial proportion of vulnerable children.

Still, there are limitations to the research presented herein: more could be done to articulate the econometric models of nutritional status, even given existing data constraints; the claim in the third paper of a welfare economics perspective is perhaps overstated. The econometric models employed for the nutritional analysis represent a solid analysis so far as they go, but they fall short of full investigation. The fixed effects models do not add to the analysis; due to the inflation of the standard errors when adding the fixed effects, their results simply are uninformative and should not be overinterpreted. It would have been useful to execute random effects models, as well, and test for the consistency of estimates under the random effects assumption, i.e., that the individual effect is not correlated with the other regressors in the model. Hence, the preferred approach would have been, under each specification, to execute the random effects model, follow with the fixed effects model, and conduct a Hausman test to compare the two. The null hypothesis of the Hausman test is that the random effects estimates are efficient. If the Hausman test fails to find a difference between the coefficient estimates under the two specifications, then one would choose the random effects models because they are more efficient. If the Hausman test rejects the null hypothesis, then one would favor the fixed effects results because they are consistent.

The third paper in the analysis, which compares old age pensions and universal child grants, asserts a welfare economics framework but fails to follow through in its analysis. The primary concern is the failure to articulate an underlying social welfare function that the policy maker seeks to optimize. Social welfare, in this case, should be represented by more than increases in consumption; some improvement in the human situation, one that leads to improvements in the productivity of society, should be the objective of the cash transfers. Thus, it would be useful to include measures of child health in the simulations of the competing targeting strategies for cash transfers. Further, a cash transfer program, however well designed, is not the only available strategy for mitigating the poverty constraint in access to health services and education. For example, targeted subsidies to reduce prices at the point of service also mitigate poverty constraints.

Optimization of the social welfare function across competing policy alternatives is challenging. One approach is to compare the administrative costs of alternative strategies that yield similar benefits. The analysis at hand incorporates administrative costs, but could do more to assess their effect on resource requirements. As presented, the analysis treats administrative costs as a fixed overhead rate; sensitivity analysis on the load factor would be useful. Even more informative would to consider a range of load factors for administrative costs and assess attendant differences in the overall cost and budget implications of the programs under comparison, e.g. cash transfers or targeted price subsidies. Rather than basing this on assumption, a range of load factors may be drawn from the published literature and evaluations of pilot programs.

The work presented herein suggests a number of directions for future research. Future analyses of the DHS will marry the results of nutritional analysis to observations on enrolment status within the same populations; where methods allow, it would be of interest to determine whether enrolment and nutritional status are correlated within households. It is possible that households that benefit under an old age pension make different resource allocation decisions, on average, than households that benefit under a universal child grant; there are inherent differences in household structure, as has been shown. Hence, comparison of old-age pensions and universal cash grants will be expanded to include simulation of the health effects of cash transfers, similar the enrolment simulation in the second paper. At the same time, sensitivity analysis will be conducted of the budget performance of alternative cash transfer programs to assumptions regarding the load factor for administrative costs.

APPENDIX A: CHAPTER II

Table A1A: Full HAZ Results for Kenya

Controls included in model:	baseline	wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Kenya: HAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Orphans in blended HH	-0.036	0.001	0.019	0.003	0.007			
	(0.120)	(0.122)	(0.118)	(0.121)	(0.125)			
Orphans in non-blended HH	0.259	0.283	0.313	0.312	0.290			
	(0.133)	(0.134)	(0.135)	(0.137)	(0.140)			
Non-orphans in blended HH	0.072	0.081	0.088	0.079	0.111			
	(0.084)	(0.083)	(0.084)	(0.088)	(0.089)			
orphan						-0.077	-0.151	-0.683
						(0.193)	(0.598)	(0.500)
Sex	0.202	0.210	0.214	0.213	0.219	0.207	0.209	0.220
	(0.040)	(0.039)	(0.039)	(0.039)	(0.039)	(0.060)	(0.060)	(0.060)
Age 13-24 mos	-1.126	-1.117	-1.126	-1.122	-1.128	-1.311	-1.313	-1.320
	(0.063)	(0.062)	(0.062)	(0.062)	(0.063)	(0.088)	(0.087)	(0.088)
Age 25-59 mos	-0.824	-0.816	-0.826	-0.818	-0.828	-0.963	-0.964	-0.987
	(0.046)	(0.046)	(0.047)	(0.047)	(0.047)	(0.065)	(0.065)	(0.065)
Poorer		0.124	0.047	0.047	0.05			
		(0.074)	(0.072)	(0.072)	(0.073)			
Middle		0.191	0.104	0.098	0.111			
		(0.071)	(0.069)	(0.069)	(0.070)			
Richer		0.295	0.176	0.172	0.183			
		(0.081)	(0.080)	(0.081)	(0.082)			
Richest		0.671	0.485	0.464	0.464			
		(0.083)	(0.083)	(0.085)	(0.085)			
Max female educ, yrs			0.030	0.026	0.027			
			(0.008)	(0.008)	(0.008)			
Women of				0.064	0.080			
Reproductive age				(0.030)	(0.033)			
Elder women				-0.029	0.04			
				(0.069)	(0.084)			
Kids<13				-0.021	-0.024			
				(0.016)	(0.016)			
Orphan x poorer							0.058	0.523
wealth quintile							(0.669)	(0.575)
Orphan x middle							1.093	1.703
							(0.818)	(0.751)
Orphan x richer							0.046	0.601
							(0.670)	(0.630)
Orphan x richest							-0.583	0.203
							(0.660)	(0.583)
grandparent					-0.09			-0.461
					(0.080)			(0.200)
other relative					-0.2			-0.151
					(0.127)			(0.199)
Constant	-0.606	-0.865	-0.976	-0.967	-0.976	-0.476	-0.482	-0.398
	(0.048)	(0.067)	(0.080)	(0.096)	(0.096)	(0.057)	(0.057)	(0.065)
Observations	5028	5028	4977	4977	4938	5028	5028	4989
Adjusted R-squared	0.0814	0.1078	0.1141	0.1148	0.1169	0.169	0.1705	0.1771
Number of households						3489	3489	3465

See notes to Table 2.2A for explanation of models. Coefficients in columns 6-8 are based on household level fixed effects models estimated on blended households only. Robust standard errors in parentheses. Coefficients in bold are significant at $p \leq 0.05$.

Table A1B: Full WAZ Results for Kenya

Controls included in model:	baseline	wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Kenya: WAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Orphans in blended HH	-0.074	-0.045	-0.056	-0.049	-0.015			
	(0.101)	(0.102)	(0.098)	(0.099)	(0.103)			
Orphans in non-blended HH	0.13	0.158	0.212	0.210	0.202			
	(0.118)	(0.117)	(0.112)	(0.116)	(0.119)			
Non-orphans in blended HH	0.149	0.156	0.151	0.170	0.203			
	(0.077)	(0.075)	(0.074)	(0.076)	(0.077)			
orphan						-0.330	-0.269	-0.423
						(0.180)	(0.465)	(0.531)
Sex	0.166	0.176	0.183	0.182	0.188	0.184	0.185	0.198
	(0.034)	(0.033)	(0.033)	(0.033)	(0.033)	(0.049)	(0.049)	(0.049)
Age 13-24 mos	-1.029	-1.015	-1.022	-1.020	-1.026	-1.212	-1.213	-1.211
	(0.059)	(0.058)	(0.057)	(0.057)	(0.058)	(0.074)	(0.074)	(0.075)
Age 25-59 mos	-0.874	-0.865	-0.868	-0.857	-0.866	-0.933	-0.935	-0.947
	(0.046)	(0.046)	(0.045)	(0.045)	(0.046)	(0.062)	(0.062)	(0.063)
Poorer		0.260	0.121	0.116	0.121			
		(0.060)	(0.058)	(0.058)	(0.058)			
middle		0.406	0.238	0.224	0.229			
		(0.063)	(0.060)	(0.061)	(0.060)			
richer		0.497	0.265	0.248	0.261			
		(0.068)	(0.067)	(0.067)	(0.067)			
richest		0.861	0.528	0.479	0.479			
		(0.069)	(0.066)	(0.067)	(0.067)			
Female educ, yrs			0.054	0.050	0.050			
			(0.006)	(0.006)	(0.006)			
Women of				0.055	0.080			
Reproductive age				(0.025)	(0.029)			
Elder women				-0.068	0.025			
				(0.060)	(0.074)			
Kids<13				-0.044	-0.046			
				(0.014)	(0.014)			
Orphan x poorer							-0.196	0.099
wealth quintile							(0.555)	(0.617)
Orphan x middle							-0.448	-0.147
							(0.888)	(0.875)
Orphan x richer							0.355	0.448
							(0.513)	(0.604)
Orphan x richest							-0.134	0.127
							(0.501)	(0.590)
grandparent					-0.145			-0.506
					(0.074)			(0.174)
other relative					-0.210			-0.111
					(0.111)			(0.195)
Constant	-0.319	-0.718	-0.913	-0.803	-0.821	-0.224	-0.223	-0.146
	(0.050)	(0.059)	(0.062)	(0.081)	(0.081)	(0.054)	(0.054)	(0.064)
Observations	5112	5112	5061	5061	5022	5112	5112	5073
Adjusted R-squared	0.0958	0.1476	0.1711	0.1737	0.175	0.1917	0.192	0.1955
No. of households						3527	3527	3503

See notes to Appendix Table A1A for explanation.

Table A1C: Full WHZ Results for Kenya

Controls included in model:	baseline	wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Kenya: WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	-0.097	-0.091	-0.128	-0.114	-0.084			
Orphans in blended HH	(0.095)	(0.093)	(0.092)	(0.094)	(0.096)			
	-0.051	-0.039	0.022	0.013	0.017			
Orphans in non-blended HH	(0.109)	(0.107)	(0.103)	(0.105)	(0.110)			
	0.099	0.101	0.094	0.126	0.141			
Non-orphans in blended HH	(0.071)	(0.069)	(0.067)	(0.069)	(0.069)			
orphan						-0.307	-0.132	0.043
						(0.188)	(0.543)	(0.552)
Sex	0.112	0.119	0.122	0.120	0.124	0.133	0.135	0.142
	(0.033)	(0.032)	(0.032)	(0.032)	(0.032)	(0.049)	(0.049)	(0.049)
Age 13-24 mos	-0.493	-0.482	-0.484	-0.482	-0.483	-0.564	-0.563	-0.557
	(0.057)	(0.056)	(0.055)	(0.055)	(0.056)	(0.078)	(0.079)	(0.080)
Age 25-59 mos	-0.424	-0.419	-0.418	-0.406	-0.409	-0.402	-0.403	-0.401
	(0.047)	(0.047)	(0.046)	(0.046)	(0.046)	(0.067)	(0.067)	(0.069)
poorer		0.224	0.101	0.091	0.095			
		(0.054)	(0.053)	(0.053)	(0.053)			
middle		0.403	0.238	0.219	0.216			
		(0.066)	(0.062)	(0.062)	(0.062)			
richer		0.441	0.225	0.200	0.207			
		(0.066)	(0.063)	(0.063)	(0.063)			
richest		0.610	0.309	0.252	0.253			
		(0.071)	(0.070)	(0.071)	(0.071)			
Female educ, yrs			0.049	0.045	0.045			
			(0.006)	(0.006)	(0.006)			
Women of				0.040	0.057			
Reproductive age				(0.024)	(0.026)			
Elder women				-0.053	0.002			
				(0.058)	(0.073)			
Kids<13				-0.055	-0.054			
				(0.012)	(0.012)			
Orphan x poorer							-0.432	-0.4
wealth quintile							(0.638)	(0.638)
Orphan x middle							-1.124	-1.192
							(0.789)	(0.761)
Orphan x richer							0.279	-0.013
							(0.584)	(0.602)
Orphan x richest							0.225	0.062
							(0.553)	(0.567)
grandparent					-0.091			-0.334
					(0.062)			(0.154)
other relative					-0.128			0.011
					(0.112)			(0.212)
Constant	0.04	-0.287	-0.461	-0.296	-0.312	0.053	0.055	0.097
	(0.049)	(0.061)	(0.064)	(0.080)	(0.081)	(0.058)	(0.058)	(0.069)
Observations	5192	5192	5134	5134	5095	5192	5192	5152
Adjusted R-squared	0.0264	0.0586	0.0797	0.0839	0.0829	0.0468	0.0496	0.0492
No. of households						3576	3576	3551

See notes to Appendix Table A1A for explanation.

Table A2A: Full HAZ Results for Lesotho

Controls included in model:	baseline	Wealth	Female education	demographics	Kinship	Household Fixed Effects Models		
Lesotho HAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.012	0.058	0.051	0.107	0.103			
Orphans in blended HH	(0.149)	(0.151)	(0.151)	(0.157)	(0.159)			
	0.015	0.042	0.058	0.049	0.051			
Orphans in non-blended HH	(0.107)	(0.106)	(0.107)	(0.107)	(0.109)			
	-0.016	0.005	-0.003	0.031	0.04			
Non-orphans in blended HH	(0.088)	(0.086)	(0.086)	(0.092)	(0.096)			
orphan						-0.052	-0.021	0.036
						(0.242)	(0.530)	(0.516)
Sex	0.155	0.158	0.157	0.158	0.156	0.202	0.212	0.165
	(0.062)	(0.060)	(0.060)	(0.060)	(0.060)	(0.117)	(0.120)	(0.118)
Age 13-24 mos	-1.138	-1.145	-1.155	-1.171	-1.170	-1.218	-1.219	-1.217
	(0.104)	(0.102)	(0.103)	(0.103)	(0.104)	(0.184)	(0.185)	(0.185)
Age 25-59 mos	-0.956	-0.945	-0.937	-0.950	-0.953	-1.076	-1.078	-1.071
	(0.079)	(0.078)	(0.078)	(0.078)	(0.079)	(0.128)	(0.128)	(0.129)
poorer		0.028	0.009	0.006	0.009			
		(0.094)	(0.095)	(0.095)	(0.095)			
middle		0.284	0.251	0.243	0.249			
		(0.102)	(0.104)	(0.106)	(0.106)			
richer		0.501	0.450	0.428	0.428			
		(0.098)	(0.107)	(0.109)	(0.109)			
richest		0.586	0.501	0.463	0.478			
		(0.110)	(0.122)	(0.125)	(0.127)			
Female educ, yrs			0.023	0.030	0.030			
			(0.014)	(0.015)	(0.015)			
Women of				-0.051	-0.048			
Reproductive age				(0.040)	(0.041)			
Elder women				0.015	0.01			
				(0.073)	(0.086)			
Kids<13				-0.035	-0.035			
				(0.025)	(0.025)			
Orphan x poorer							-0.095	-0.159
wealth quintile							(0.668)	(0.654)
Orphan x middle							0.293	0.212
							(0.795)	(0.800)
Orphan x richer							-0.876	-0.933
							(0.571)	(0.562)
Orphan x richest							0.302	0.213
							(0.667)	(0.659)
grandparent					-0.004			-0.283
					(0.082)			(0.254)
other relative					-0.006			-0.13
					(0.123)			(0.312)
Constant	-0.897	-1.138	-1.273	-1.139	-1.137	-0.826	-0.826	-0.675
	(0.081)	(0.104)	(0.128)	(0.146)	(0.150)	(0.118)	(0.119)	(0.184)
Observations	1721	1721	1718	1718	1711	1721	1721	1714
Adjusted R-squared	0.0973	0.1246	0.1263	0.1284	0.1283	0.1806	0.1838	0.1805
No. of households						3489	3489	3465

See notes to Appendix Table A1A for explanation.

Table A2B: Full WAZ Results for Lesotho

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Lesotho WAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.021	0.066	0.054	0.096	0.085			
Orphans in blended HH	(0.140)	(0.139)	(0.138)	(0.146)	(0.148)			
	0.012	0.041	0.06	0.054	0.047			
Orphans in non-blended HH	(0.093)	(0.092)	(0.092)	(0.093)	(0.095)			
	0.08	0.1	0.087	0.112	0.101			
Non-orphans in blended HH	(0.079)	(0.078)	(0.077)	(0.084)	(0.085)			
orphan						-0.118	0.182	0.164
						(0.228)	(0.495)	(0.501)
Sex	0.032	0.037	0.032	0.035	0.032	0.078	0.085	0.078
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.107)	(0.109)	(0.108)
Age 13-24 mos	-0.837	-0.845	-0.854	-0.865	-0.864	-0.930	-0.931	-0.927
	(0.093)	(0.090)	(0.090)	(0.090)	(0.090)	(0.176)	(0.176)	(0.176)
Age 25-59 mos	-0.911	-0.895	-0.886	-0.893	-0.889	-0.906	-0.908	-0.902
	(0.074)	(0.073)	(0.073)	(0.073)	(0.074)	(0.133)	(0.131)	(0.133)
poorer		0.067	0.032	0.029	0.035			
		(0.086)	(0.088)	(0.086)	(0.086)			
middle		0.278	0.224	0.217	0.221			
		(0.087)	(0.089)	(0.090)	(0.090)			
richer		0.445	0.361	0.342	0.348			
		(0.091)	(0.097)	(0.097)	(0.097)			
richest		0.619	0.487	0.457	0.463			
		(0.108)	(0.121)	(0.124)	(0.125)			
Female educ, yrs		0.034	0.038	0.037				
			(0.012)	(0.013)	(0.013)			
Women of				-0.025	-0.03			
Reproductive age				(0.037)	(0.038)			
Elder women				0.017	0.004			
				(0.062)	(0.075)			
Kids<13				-0.035	-0.034			
				(0.022)	(0.022)			
Orphan x poorer							-0.727	-0.692
wealth quintile							(0.565)	(0.574)
Orphan x middle							0.1	0.135
							(0.770)	(0.781)
Orphan x richer							-1.018	-1
							(0.672)	(0.677)
Orphan x richest							0.046	-0.01
							(0.647)	(0.666)
grandparent					0.017			0.041
					(0.074)			(0.262)
other relative					0.159			-0.13
					(0.105)			(0.301)
Constant	-0.351	-0.599	-0.792	-0.678	-0.686	-0.319	-0.321	-0.327
	(0.071)	(0.088)	(0.108)	(0.124)	(0.127)	(0.117)	(0.118)	(0.180)
Observations	1752	1752	1749	1749	1741	1752	1752	1744
Adjusted R-squared	0.0878	0.117	0.1211	0.122	0.1223	0.1435	0.1512	0.1495
No. of households						1364	1364	1359

See notes to Appendix Table A1A for explanation.

Table A3A: Full HAZ Results for Malawi

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Lesotho WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.001	0.016	0.012	0.033	0.012			
Orphans in blended HH	(0.130)	(0.128)	(0.129)	(0.139)	(0.140)			
	0.028	0.04	0.054	0.054	0.042			
Orphans in non-blended HH	(0.084)	(0.084)	(0.085)	(0.087)	(0.088)			
	0.105	0.114	0.104	0.118	0.09			
Non-orphans in blended HH	(0.073)	(0.073)	(0.073)	(0.080)	(0.082)			
orphan						-0.127	0.465	0.41
						(0.209)	(0.291)	(0.285)
Sex	0.001	0.001	-0.004	0.001	-0.006	0.019	0.021	0.051
	(0.055)	(0.056)	(0.056)	(0.056)	(0.055)	(0.125)	(0.125)	(0.125)
Age 13-24 mos	-0.290	-0.296	-0.301	-0.305	-0.312	-0.149	-0.147	-0.151
	(0.108)	(0.108)	(0.108)	(0.107)	(0.106)	(0.188)	(0.189)	(0.189)
Age 25-59 mos	-0.469	-0.462	-0.454	-0.453	-0.453	-0.279	-0.279	-0.280
	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.135)	(0.133)	(0.134)
poorer		0.082	0.053	0.05	0.052			
		(0.079)	(0.082)	(0.082)	(0.082)			
middle		0.135	0.091	0.085	0.084			
		(0.084)	(0.087)	(0.087)	(0.087)			
richer		0.180	0.111	0.098	0.101			
		(0.084)	(0.088)	(0.088)	(0.089)			
richest		0.312	0.209	0.192	0.199			
		(0.098)	(0.108)	(0.110)	(0.111)			
Female educ, yrs			0.026	0.025	0.026			
			(0.012)	(0.012)	(0.012)			
Women of				0.008	-0.002			
Reproductive age				(0.029)	(0.030)			
Elder women				0	-0.032			
				(0.069)	(0.084)			
Kids<13				-0.027	-0.027			
				(0.020)	(0.020)			
Orphan x poorer							-1.215	-1.113
wealth quintile							(0.456)	(0.447)
Orphan x middle							-0.582	-0.472
							(0.570)	(0.568)
Orphan x richer							-0.571	-0.516
							(0.717)	(0.716)
Orphan x richest							-0.211	-0.309
							(0.469)	(0.477)
grandparent					0.056			0.083
					(0.080)			(0.210)
other relative					0.211			-0.341
					(0.102)			(0.246)
Constant	0.274	0.148	0.005	0.073	0.061	0.173	0.164	0.147
	(0.085)	(0.098)	(0.118)	(0.127)	(0.128)	(0.131)	(0.131)	(0.180)
Observations	1780	1780	1776	1776	1768	1780	1780	1771
Adjusted R-squared	0.024	0.0287	0.031	0.0303	0.0326	0.0154	0.027	0.0331
No. of households						1380	1380	1374

See notes to Appendix Table A1A for explanation.

Table A3A: Full HAZ Results for Malawi

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Malawi WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.047	0.027	-0.028	-0.024	-0.038			
Orphans in blended HH	(0.131)	(0.129)	(0.123)	(0.126)	(0.132)			
	-0.057	-0.001	0.003	0.004	0.008			
Orphans in non-blended HH	(0.097)	(0.097)	(0.098)	(0.099)	(0.105)			
	0.093	0.039	0.049	0.051	0.042			
Non-orphans in blended HH	(0.048)	(0.049)	(0.049)	(0.051)	(0.052)			
orphan						0.205	0.497	0.686
						(0.201)	(0.401)	(0.379)
Sex	0.144	0.138	0.147	0.147	0.141	0.198	0.199	0.202
	(0.032)	(0.031)	(0.031)	(0.031)	(0.032)	(0.052)	(0.052)	(0.053)
Age 13-24 mos	-1.220	-1.235	-1.241	-1.242	-1.244	-1.488	-1.489	-1.503
	(0.046)	(0.045)	(0.046)	(0.046)	(0.046)	(0.077)	(0.077)	(0.078)
Age 25-59 mos	-0.979	-1.001	-1.004	-1.002	-0.996	-1.151	-1.153	-1.156
	(0.042)	(0.041)	(0.042)	(0.041)	(0.042)	(0.056)	(0.056)	(0.057)
poorer		0.05	0.059	0.059	0.057			
		(0.051)	(0.051)	(0.051)	(0.051)			
middle		0.137	0.133	0.134	0.131			
		(0.050)	(0.050)	(0.050)	(0.050)			
richer		0.317	0.303	0.305	0.300			
		(0.052)	(0.052)	(0.053)	(0.053)			
richest		0.625	0.586	0.587	0.585			
		(0.063)	(0.064)	(0.064)	(0.064)			
Female educ, yrs			0.007	0.006	0.006			
			(0.005)	(0.005)	(0.005)			
Women of				0.025	0.018			
Reproductive age				(0.030)	(0.032)			
Elder women				-0.005	-0.024			
				(0.053)	(0.067)			
Kids<13				-0.01	-0.01			
				(0.012)	(0.013)			
Orphan x poorer							-0.527	-0.811
wealth quintile							(0.507)	(0.529)
Orphan x middle							-0.334	-0.693
							(0.567)	(0.552)
Orphan x richer							0.154	0.045
							(0.669)	(0.688)
Orphan x richest							-0.547	-0.749
							(0.615)	(0.601)
grandparent					0.034			0.007
					(0.065)			(0.168)
other relative					-0.004			0.214
					(0.098)			(0.224)
Constant	-1.084	-1.259	-1.283	-1.277	-1.266	-0.953	-0.955	-0.955
	(0.040)	(0.054)	(0.058)	(0.073)	(0.072)	(0.053)	(0.054)	(0.061)
Observations	8629	8629	8552	8552	8378	8629	8629	8451
Adjusted R-squared	0.0949	0.1142	0.1156	0.1154	0.1154	0.194	0.1944	0.1983
No. of households						6290	6290	6185

See notes to Appendix Table A1A for explanation.

Table A2C: Full WHZ Results for Lesotho

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Malawi WAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.07	0.051	0.033	0.029	0.007			
Orphans in blended HH	(0.099)	(0.097)	(0.096)	(0.096)	(0.104)			
	-0.071	-0.022	-0.019	-0.019	-0.013			
Orphans in non-blended HH	(0.075)	(0.075)	(0.075)	(0.075)	(0.080)			
	0.129	0.094	0.088	0.085	0.079			
Non-orphans in blended HH	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)			
orphan						0.274	0.178	0.191
						(0.176)	(0.362)	(0.393)
Sex	0.086	0.081	0.086	0.086	0.076	0.05	0.048	0.039
	(0.027)	(0.026)	(0.026)	(0.026)	(0.027)	(0.041)	(0.041)	(0.041)
Age 13-24 mos	-0.952	-0.962	-0.974	-0.974	-0.973	-1.110	-1.111	-1.116
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.068)	(0.068)	(0.069)
Age 25-59 mos	-0.792	-0.806	-0.805	-0.805	-0.802	-0.818	-0.819	-0.819
	(0.037)	(0.036)	(0.037)	(0.037)	(0.037)	(0.048)	(0.048)	(0.050)
poorer		0.113	0.111	0.112	0.114			
		(0.043)	(0.043)	(0.043)	(0.044)			
middle		0.161	0.147	0.147	0.143			
		(0.039)	(0.039)	(0.039)	(0.039)			
richer		0.232	0.200	0.200	0.197			
		(0.041)	(0.041)	(0.041)	(0.042)			
richest		0.485	0.415	0.414	0.415			
		(0.046)	(0.048)	(0.049)	(0.049)			
Female educ, yrs			0.014	0.014	0.013			
			(0.004)	(0.004)	(0.004)			
Women of				0.003	-0.001			
Reproductive age				(0.025)	(0.026)			
Elder women				0.007	-0.008			
				(0.043)	(0.057)			
Kids<13				0.002	0.001			
				(0.010)	(0.011)			
Orphan x poorer							0.052	-0.117
wealth quintile							(0.476)	(0.493)
Orphan x middle							0.401	0.188
							(0.489)	(0.478)
Orphan x richer							0.081	0.019
							(0.634)	(0.678)
Orphan x richest							-0.21	-0.242
							(0.560)	(0.576)
grandparent					0.028			-0.005
					(0.052)			(0.156)
other relative					-0.043			0.162
					(0.083)			(0.188)
Constant	-0.481	-0.646	-0.681	-0.690	-0.674	-0.410	-0.407	-0.398
	(0.035)	(0.044)	(0.046)	(0.057)	(0.057)	(0.045)	(0.046)	(0.053)
Observations	8888	8888	8808	8808	8625	8888	8888	8701
Adjusted R-squared	0.0857	0.0995	0.1022	0.1019	0.101	0.145	0.1453	0.1459
No. of households						6447	6447	6335

otes to Appendix Table A1A for explanation.

Table A3C: Full WHZ Results for Malawi

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Malawi WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Orphans in blended HH	0.01	0.009	0.02	0.017	-0.026			
	(0.093)	(0.093)	(0.094)	(0.095)	(0.103)			
Orphans in non-blended HH	-0.031	-0.021	-0.017	-0.016	-0.041			
	(0.079)	(0.080)	(0.080)	(0.080)	(0.086)			
Non-orphans in blended HH	0.083	0.085	0.070	0.068	0.061			
	(0.038)	(0.038)	(0.039)	(0.040)	(0.041)			
orphan						0.142	-0.245	-0.322
						(0.188)	(0.320)	(0.331)
Sex	0.012	0.012	0.012	0.012	0.006	-0.064	-0.068	-0.083
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.043)	(0.043)	(0.043)
Age 13-24 mos	-0.427	-0.427	-0.432	-0.431	-0.426	-0.413	-0.416	-0.402
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.078)	(0.078)	(0.079)
Age 25-59 mos	-0.341	-0.341	-0.334	-0.335	-0.336	-0.283	-0.285	-0.271
	(0.042)	(0.042)	(0.042)	(0.043)	(0.043)	(0.054)	(0.054)	(0.056)
poorer		0.082	0.074	0.073	0.079			
		(0.043)	(0.043)	(0.043)	(0.044)			
middle		0.072	0.056	0.055	0.052			
		(0.043)	(0.044)	(0.044)	(0.044)			
richer		0.02	-0.012	-0.014	-0.014			
		(0.043)	(0.043)	(0.044)	(0.044)			
richest		0.065	-0.001	-0.003	-0.004			
		(0.053)	(0.055)	(0.055)	(0.056)			
Female educ, yrs			0.013	0.014	0.014			
			(0.005)	(0.005)	(0.005)			
Women of				-0.014	-0.021			
Reproductive age				(0.026)	(0.027)			
Elder women				-0.004	-0.061			
				(0.047)	(0.061)			
Kids<13				0.009	0.008			
				(0.011)	(0.011)			
Orphan x poorer							0.675	0.682
wealth quintile							(0.523)	(0.568)
Orphan x middle							0.794	0.751
							(0.472)	(0.519)
Orphan x richer							0.15	0.095
							(0.597)	(0.618)
Orphan x richest							-0.04	0.28
							(0.584)	(0.573)
grandparent					0.087			0.009
					(0.052)			(0.152)
other relative					-0.017			-0.189
					(0.089)			(0.185)
Constant	0.357	0.308	0.274	0.263	0.276	0.364	0.370	0.376
	(0.042)	(0.052)	(0.053)	(0.064)	(0.063)	(0.051)	(0.051)	(0.057)
Observations	8892	8892	8812	8812	8626	8892	8892	8702
Adjusted R-squared	0.0154	0.0156	0.0165	0.0163	0.0162	0.0187	0.0201	0.0189
No. of households						6450	6450	6337

See notes to Appendix Table A1A for explanation.

Table A4A: Full HAZ Results for Tanzania

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Tanzania HAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	-0.162	-0.184	-0.185	-0.229	-0.234			
Orphans in blended HH	(0.127)	(0.121)	(0.120)	(0.118)	(0.125)			
	-0.03	0.036	0.073	0.091	0.113			
Orphans in non-blended HH	(0.139)	(0.135)	(0.139)	(0.140)	(0.140)			
	0.097	0.042	0.041	-0.018	-0.007			
Non-orphans in blended HH	(0.044)	(0.043)	(0.043)	(0.043)	(0.043)			
orphan						-0.116	-0.193	-0.066
						(0.208)	(0.457)	(0.434)
Sex	0.115	0.118	0.115	0.116	0.110	0.156	0.156	0.158
	(0.028)	(0.027)	(0.027)	(0.026)	(0.026)	(0.039)	(0.039)	(0.040)
Age 13-24 mos	-0.931	-0.920	-0.923	-0.917	-0.915	-0.939	-0.939	-0.944
	(0.040)	(0.039)	(0.039)	(0.039)	(0.040)	(0.054)	(0.054)	(0.057)
Age 25-59 mos	-0.847	-0.846	-0.850	-0.852	-0.845	-0.875	-0.873	-0.871
	(0.034)	(0.033)	(0.033)	(0.034)	(0.034)	(0.043)	(0.043)	(0.043)
poorer		0.038	0.039	0.052	0.042			
		(0.056)	(0.056)	(0.052)	(0.053)			
middle		0.127	0.115	0.136	0.129			
		(0.056)	(0.056)	(0.050)	(0.051)			
richer		0.361	0.337	0.364	0.359			
		(0.061)	(0.060)	(0.053)	(0.053)			
richest		0.856	0.810	0.846	0.847			
		(0.062)	(0.063)	(0.057)	(0.057)			
Female educ, yrs			0.011	0.011	0.012			
			(0.005)	(0.005)	(0.005)			
Women of				0.015	0.031			
Reproductive age				(0.020)	(0.020)			
Elder women				0.078	0.129			
				(0.041)	(0.049)			
Kids<13				0.033	0.030			
				(0.010)	(0.010)			
Orphan x poorer							-0.667	-0.972
wealth quintile							(0.591)	(0.592)
Orphan x middle							0.135	-0.047
							(0.696)	(0.727)
Orphan x richer							0.641	0.664
							(0.720)	(0.810)
Orphan x richest							0.222	0.216
							(0.564)	(0.558)
grandparent					-0.129			-0.111
					(0.057)			(0.121)
other relative					-0.101			-0.13
					(0.066)			(0.125)
Constant	-0.956	-1.202	-1.242	-1.409	-1.404	-0.945	-0.945	-0.919
	(0.037)	(0.059)	(0.065)	(0.056)	(0.057)	(0.037)	(0.037)	(0.041)
Observations	7910	7910	7851	7851	7643	7910	7910	7700
Adjusted R-squared	0.0878	0.1417	0.1438	0.1492	0.1498	0.1562	0.1579	0.159
No. of households						5203	5203	5110

See notes to Appendix Table A1A for explanation.

Table A4B: Full WAZ Results for Tanzania

Controls included in model:	baseline	Wealth	Female education	demographics	Kinship	Household Fixed Effects Models		
Tanzania WAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.017	0.003	-0.013	-0.044	0			
Orphans in blended HH	(0.091)	(0.089)	(0.089)	(0.089)	(0.103)			
	-0.05	-0.011	-0.01	0.007	0.023			
Orphans in non-blended HH	(0.112)	(0.109)	(0.114)	(0.114)	(0.115)			
	0.123	0.092	0.098	0.054	0.069			
Non-orphans in blended HH	(0.040)	(0.040)	(0.040)	(0.042)	(0.041)			
Orphan						0.003	-0.019	0.082
						(0.178)	(0.358)	(0.397)
Sex	0.081	0.083	0.080	0.081	0.079	0.174	0.173	0.170
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.034)	(0.034)	(0.034)
Age 13-24 mos	-0.907	-0.901	-0.902	-0.898	-0.898	-0.951	-0.951	-0.950
	(0.042)	(0.041)	(0.041)	(0.042)	(0.042)	(0.063)	(0.063)	(0.063)
Age 25-59 mos	-0.793	-0.792	-0.794	-0.794	-0.796	-0.772	-0.773	-0.771
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.044)	(0.044)	(0.044)
Poorer		0.022	0.02	0.03	0.025			
		(0.050)	(0.050)	(0.046)	(0.046)			
Middle		0.056	0.037	0.053	0.048			
		(0.048)	(0.048)	(0.044)	(0.044)			
Richer		0.198	0.166	0.185	0.180			
		(0.050)	(0.051)	(0.045)	(0.046)			
Richest		0.487	0.420	0.445	0.441			
		(0.057)	(0.058)	(0.052)	(0.053)			
Female educ, yrs			0.014	0.014	0.014			
			(0.004)	(0.004)	(0.005)			
Women of				0.019	0.035			
Reproductive age				(0.018)	(0.020)			
Elder women				0.039	0.077			
				(0.038)	(0.043)			
Kids<13				0.023	0.022			
				(0.010)	(0.010)			
Orphan x poorer							-0.225	-0.127
wealth quintile							(0.706)	(0.734)
Orphan x middle							0.181	-0.073
							(0.611)	(0.655)
Orphan x richer							0.352	0.274
							(0.435)	(0.493)
Orphan x richest							-0.156	-0.138
							(0.472)	(0.513)
Grandparent					-0.086			-0.008
					(0.045)			(0.102)
other relative					-0.146			-0.182
					(0.057)			(0.109)
Constant	-0.571	-0.706	-0.759	-0.885	-0.886	-0.604	-0.604	-0.593
	(0.035)	(0.052)	(0.056)	(0.053)	(0.053)	(0.038)	(0.038)	(0.043)
Observations	7971	7971	7912	7912	7703	7971	7971	7760
Adjusted R-squared	0.0975	0.1191	0.1217	0.1252	0.1263	0.1565	0.1568	0.1589
No. of households						5235	5235	5141

See notes to Appendix Table A1A for explanation.

Table A4C: Full WHZ Results for Tanzania

Controls included in model:	Baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Tanzania WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.072	0.073	0.055	0.042	0.085			
Orphans in blended HH	(0.086)	(0.086)	(0.087)	(0.087)	(0.093)			
Orphans in non-blended HH	0.021	0.017	-0.006	-0.004	-0.001			
	(0.104)	(0.104)	(0.104)	(0.104)	(0.105)			
	0.080	0.082	0.089	0.075	0.082			
Non-orphans in blended HH	(0.037)	(0.037)	(0.037)	(0.039)	(0.040)			
orphan						-0.031	-0.13	-0.135
						(0.146)	(0.333)	(0.322)
Sex	0.065	0.065	0.063	0.063	0.066	0.129	0.127	0.124
	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.033)	(0.033)	(0.034)
Age 13-24 mos	-0.652	-0.653	-0.651	-0.651	-0.654	-0.671	-0.672	-0.664
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.068)	(0.068)	(0.068)
Age 25-59 mos	-0.478	-0.479	-0.477	-0.475	-0.483	-0.420	-0.422	-0.423
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.046)	(0.046)	(0.046)
poorer		-0.025	-0.027	-0.026	-0.023			
		(0.039)	(0.040)	(0.039)	(0.039)			
middle		-0.033	-0.049	-0.045	-0.044			
		(0.040)	(0.041)	(0.040)	(0.040)			
richer		-0.042	-0.065	-0.059	-0.063			
		(0.041)	(0.043)	(0.043)	(0.043)			
richest		-0.058	-0.112	-0.110	-0.112			
		(0.048)	(0.052)	(0.051)	(0.052)			
Female educ, yrs			0.010	0.010	0.010			
			(0.004)	(0.004)	(0.004)			
Women of				0.019	0.025			
Reproductive age				(0.016)	(0.018)			
Elder women				0.017	0.021			
				(0.034)	(0.041)			
Kids<13				0	0			
				(0.008)	(0.008)			
Orphan x poorer							-0.159	0.04
wealth quintile							(0.508)	(0.463)
Orphan x middle							0.608	0.521
							(0.445)	(0.448)
Orphan x richer							0.298	0.234
							(0.423)	(0.442)
Orphan x richest							-0.121	-0.075
							(0.452)	(0.456)
grandparent					-0.006			0.112
					(0.039)			(0.105)
other relative					-0.086			-0.115
					(0.055)			(0.100)
Constant	0.138	0.168	0.128	0.098	0.095	0.090	0.091	0.078
	(0.034)	(0.041)	(0.044)	(0.048)	(0.048)	(0.041)	(0.041)	(0.048)
Observations	8016	8016	7957	7957	7744	8016	8016	7801
Adjusted R-squared	0.0485	0.0483	0.0494	0.0495	0.0505	0.0671	0.068	0.0677
No. of households						5260	5260	5164

See notes to Appendix Table A1A for explanation.

Table A5A: Full HAZ Results for Zambia

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Zambia HAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.022	-0.004	-0.034	0.011	0.015			
Orphans in blended HH	(0.101)	(0.097)	(0.098)	(0.097)	(0.101)			
	0.183	0.166	0.155	0.164	0.159			
Orphans in non-blended HH	(0.166)	(0.163)	(0.169)	(0.170)	(0.184)			
	0.036	-0.019	-0.055	-0.011	-0.024			
Non-orphans in blended HH	(0.052)	(0.053)	(0.052)	(0.055)	(0.054)			
orphan						-0.244	-0.272	-0.195
						(0.175)	(0.444)	(0.432)
Sex	0.088	0.092	0.099	0.099	0.096	0.119	0.117	0.131
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.051)	(0.052)	(0.052)
Age 13-24 mos	-1.115	-1.127	-1.133	-1.141	-1.153	-1.371	-1.373	-1.367
	(0.052)	(0.053)	(0.054)	(0.054)	(0.054)	(0.078)	(0.079)	(0.080)
Age 25-59 mos	-1.044	-1.059	-1.069	-1.067	-1.079	-1.236	-1.238	-1.246
	(0.048)	(0.048)	(0.047)	(0.048)	(0.047)	(0.060)	(0.060)	(0.060)
poorer		0.052	0.03	0.028	0.023			
		(0.060)	(0.060)	(0.060)	(0.060)			
middle		0.149	0.103	0.105	0.097			
		(0.057)	(0.057)	(0.056)	(0.057)			
richer		0.367	0.254	0.242	0.233			
		(0.063)	(0.065)	(0.064)	(0.064)			
richest		0.746	0.569	0.550	0.555			
		(0.079)	(0.083)	(0.083)	(0.085)			
Female educ, yrs			0.033	0.033	0.035			
			(0.007)	(0.007)	(0.007)			
Women of				0.022	0.032			
Reproductive age				(0.025)	(0.027)			
Elder women				-0.095	-0.062			
				(0.056)	(0.069)			
Kids<13				-0.035	-0.037			
				(0.012)	(0.013)			
Orphan x poorer							-0.559	-0.361
wealth quintile							(0.553)	(0.548)
Orphan x middle							0.51	0.368
							(0.600)	(0.631)
Orphan x richer							0.032	0.064
							(0.501)	(0.504)
Orphan x richest							0.769	0.856
							(0.626)	(0.657)
grandparent					-0.038			-0.256
					(0.065)			(0.128)
other relative					-0.112			-0.402
					(0.081)			(0.121)
Constant	-1.079	-1.257	-1.369	-1.273	-1.263	-0.910	-0.910	-0.855
	(0.046)	(0.060)	(0.069)	(0.075)	(0.075)	(0.053)	(0.053)	(0.059)
Observations	5806	5806	5762	5762	5659	5806	5806	5702
Adjusted R-squared	0.1017	0.1293	0.1341	0.1358	0.1384	0.2279	0.2303	0.2332
No. of households						3925	3925	3864

See notes to Appendix Table A1A for explanation.

Table A5B: Full WAZ Results for Zambia

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Zambia WAZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0.043	0.024	0.004	0.028	0.062			
Orphans in blended HH	(0.081)	(0.081)	(0.081)	(0.080)	(0.082)			
	0.02	0.011	0.02	0.029	0.083			
Orphans in non-blended HH	(0.114)	(0.113)	(0.118)	(0.121)	(0.129)			
	0.006	-0.035	-0.056	-0.024	-0.015			
Non-orphans in blended HH	(0.047)	(0.048)	(0.048)	(0.049)	(0.050)			
orphan						-0.078	0.143	0.234
						(0.134)	(0.219)	(0.214)
Sex	0.037	0.038	0.042	0.041	0.035	0.072	0.072	0.072
	(0.031)	(0.031)	(0.031)	(0.030)	(0.031)	(0.045)	(0.045)	(0.046)
Age 13-24 mos	-1.034	-1.041	-1.045	-1.051	-1.062	-1.298	-1.300	-1.288
	(0.049)	(0.049)	(0.050)	(0.050)	(0.050)	(0.070)	(0.070)	(0.070)
Age 25-59 mos	-0.734	-0.743	-0.750	-0.745	-0.760	-0.853	-0.853	-0.860
	(0.045)	(0.044)	(0.045)	(0.045)	(0.044)	(0.053)	(0.053)	(0.053)
poorer		0.047	0.035	0.036	0.032			
		(0.047)	(0.047)	(0.047)	(0.047)			
middle		0.135	0.105	0.108	0.103			
		(0.046)	(0.047)	(0.047)	(0.047)			
richer		0.305	0.228	0.218	0.214			
		(0.057)	(0.059)	(0.058)	(0.059)			
richest		0.538	0.418	0.405	0.399			
		(0.062)	(0.065)	(0.064)	(0.065)			
Female educ, yrs			0.023	0.021	0.022			
			(0.006)	(0.006)	(0.006)			
Women of				0.055	0.079			
Reproductive age				(0.020)	(0.021)			
Elder women				-0.064	0.011			
				(0.043)	(0.057)			
Kids<13				-0.040	-0.045			
				(0.011)	(0.011)			
Orphan x poorer							-0.681	-0.535
wealth quintile							(0.395)	(0.381)
Orphan x middle							-0.425	-0.52
							(0.398)	(0.412)
Orphan x richer							0.003	-0.006
							(0.321)	(0.349)
Orphan x richest							0.186	0.153
							(0.510)	(0.557)
grandparent					-0.116			-0.355
					(0.060)			(0.131)
other relative					-0.180			-0.433
					(0.075)			(0.121)
Constant	-0.694	-0.838	-0.919	-0.843	-0.836	-0.582	-0.583	-0.504
	(0.047)	(0.055)	(0.060)	(0.069)	(0.070)	(0.048)	(0.048)	(0.054)
Observations	5969	5969	5925	5925	5822	5969	5969	5865
Adjusted R-squared	0.0885	0.1083	0.1114	0.1142	0.1174	0.183	0.1848	0.1912
No. of households						3995	3995	3934

See notes to Appendix Table A1A for explanation.

Table A5C: Full WHZ Results for Zambia

Controls included in model:	baseline	Wealth	Female education	Demographics	Kinship	Household Fixed Effects Models		
Zambia WHZ	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	-0.07	-0.072	-0.074	-0.076	-0.05			
Orphans in blended HH	(0.073)	(0.073)	(0.073)	(0.072)	(0.076)			
	-0.157	-0.155	-0.139	-0.134	-0.064			
Orphans in non-blended HH	(0.118)	(0.118)	(0.123)	(0.124)	(0.132)			
	-0.006	-0.012	-0.012	-0.006	0.011			
Non-orphans in blended HH	(0.035)	(0.035)	(0.036)	(0.036)	(0.037)			
orphan						-0.019	0.045	0.088
						(0.112)	(0.211)	(0.210)
Sex	0.033	0.033	0.032	0.031	0.025	0.04	0.041	0.028
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.044)	(0.044)	(0.045)
Age 13-24 mos	-0.628	-0.628	-0.626	-0.628	-0.631	-0.753	-0.753	-0.741
	(0.054)	(0.054)	(0.054)	(0.055)	(0.055)	(0.078)	(0.078)	(0.078)
Age 25-59 mos	-0.220	-0.221	-0.219	-0.216	-0.221	-0.243	-0.242	-0.243
	(0.042)	(0.042)	(0.043)	(0.043)	(0.043)	(0.057)	(0.057)	(0.057)
poorer		0.04	0.041	0.043	0.041			
		(0.040)	(0.040)	(0.041)	(0.040)			
middle		0.06	0.059	0.06	0.059			
		(0.040)	(0.041)	(0.041)	(0.041)			
richer		0.075	0.064	0.061	0.061			
		(0.046)	(0.049)	(0.049)	(0.050)			
richest		0.083	0.069	0.066	0.054			
		(0.052)	(0.059)	(0.058)	(0.060)			
Female educ, yrs			0.004	0.001	0.002			
			(0.005)	(0.005)	(0.005)			
Women of				0.039	0.056			
Reproductive age				(0.018)	(0.019)			
Elder women				-0.008	0.045			
				(0.041)	(0.049)			
Kids<13				-0.018	-0.022			
				(0.010)	(0.010)			
Orphan x poorer							-0.138	-0.16
wealth quintile							(0.316)	(0.325)
Orphan x middle							-0.317	-0.338
							(0.319)	(0.325)
Orphan x richer							0.033	0.021
							(0.321)	(0.355)
Orphan x richest							0.112	0.03
							(0.436)	(0.464)
grandparent					-0.100			-0.17
					(0.050)			(0.126)
other relative					-0.075			-0.207
					(0.059)			(0.112)
Constant	0.055	0.012	-0.008	0.007	0.01	0.086	0.085	0.128
	(0.042)	(0.048)	(0.051)	(0.060)	(0.061)	(0.049)	(0.049)	(0.054)
Observations	6029	6029	5985	5985	5880	6029	6029	5923
Adjusted R-squared	0.0364	0.0365	0.0361	0.0366	0.037	0.0613	0.0612	0.0614
No. of households						4025	4025	3965

See notes to Appendix Table A1A for explanation.

APPENDIX B: CHAPTER III

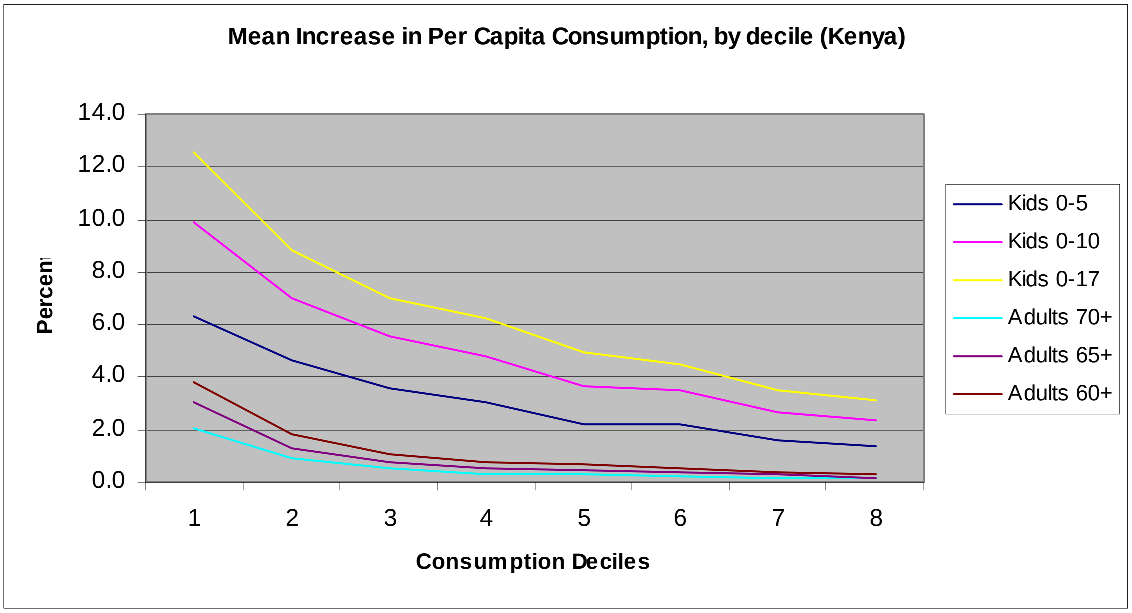
Table B1: Description of 4 Cash transfer demonstrations in ESA

	Mozambique	Kenya	Zambia	Malawi
Program	Food Subsidy Program	Cash Transfer Program for OVC	Kalomo Pilot Social Cash Transfer Scheme	Mchinji Social Cash Transfer Scheme
Source of Funding	Government	UNICEF, DFID and Government	Government and GTZ	UNICEF and Government
Executing Agencies	The National Institute for Social Action (INAS) under the Ministry of Women and Social Action.	Ministry of Home Affairs and the National AIDS Control Council	Ministry of Community Development and Social Services	Department of Poverty and Disaster Management Affair, implemented by Mchinji District Assembly.
Objective	Support entitlements to food by raising the household income	Provide households caring for orphans with financial support.	Reduce extreme poverty, hunger and starvation in the most destitute and incapacitated (non-viable) 10% of households in the region	Empower the poor to contribute to social and economic growth
Target Group	Eligibility determined by age, means testing (monthly income below USD 30) and health status (disability, chronically sick)	Households caring for OVC.	Elderly-headed households that care for orphans and other vulnerable children (OVC)	Ultra poor and work constrained households
Geographic distribution	Urban and peri-urban areas with planned expansion to rural areas	17 districts chosen on the background of the highest prevalence OVC	Pilot limited to in the Kalomo District	Pilot initiated in the Mchinji District and expanding to 5 other districts in 2008.
Number of people reached	75,000	12,500 OVC	3,500 households	4200 households
Value of Transfer (USD)	USD 4 per month for one person households to a maximum of USD 12 per month for 5+ households	Ksh 1,500 per family per month.	USD 10 per month for households without children; USD 12 for households with children	1 person hh 4 USD, 2person hh 7 USD, 3person hh 10 USD, 4+person hh 13 USD

Source; UNICEF-ESARO (2008)

APPENDIX C: CHAPTER IV

Figure C1: Proportional Increases in *Per Capita* Consumption, by decile



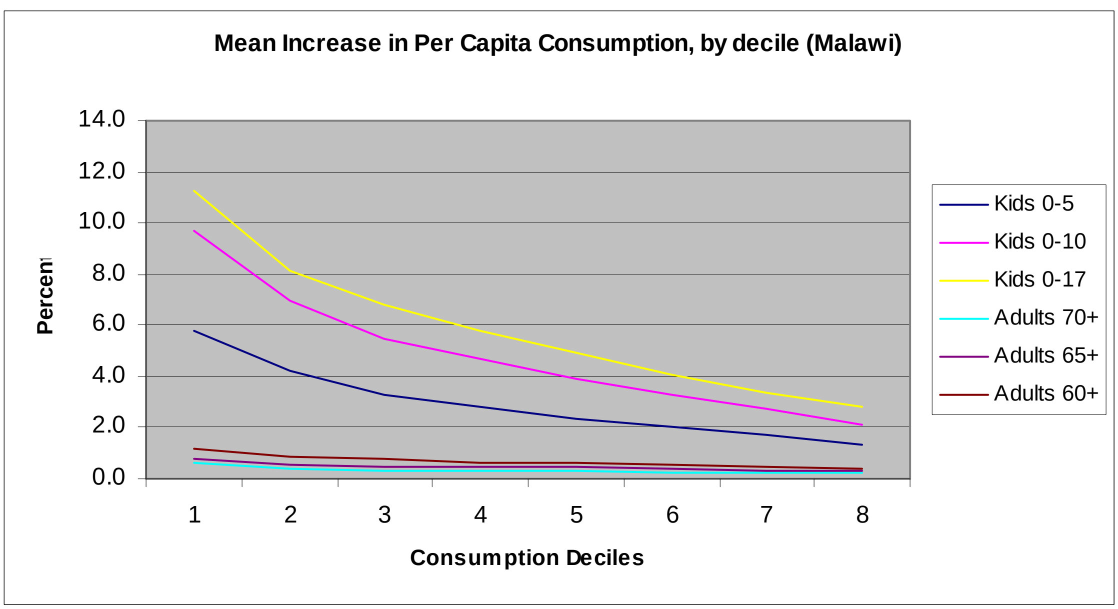
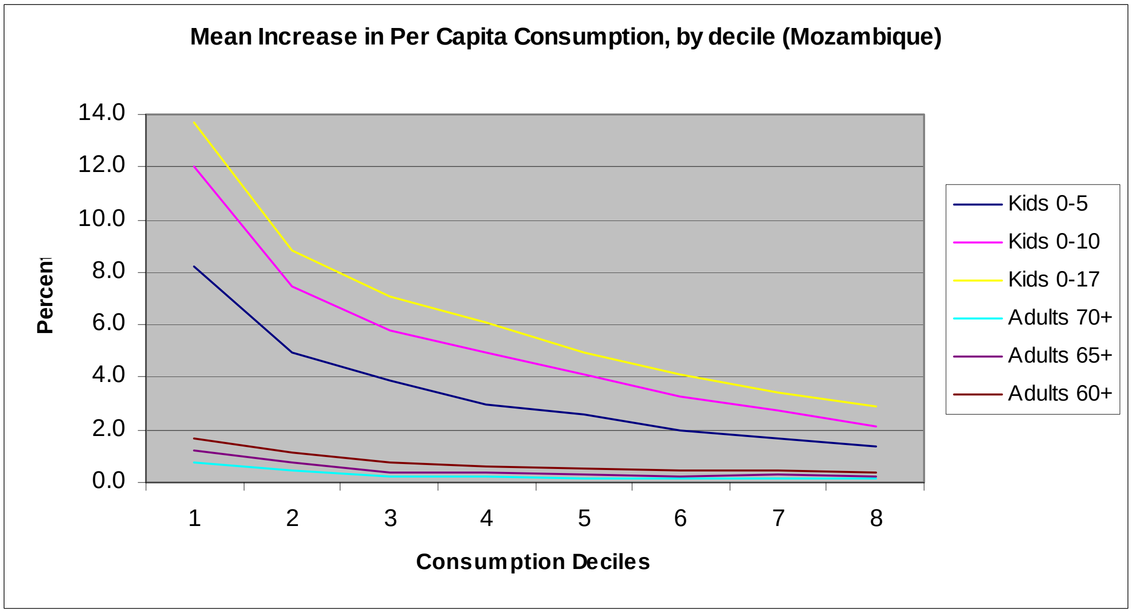


Figure C1: Proportional Increases in *Per Capita* Consumption (cont.)



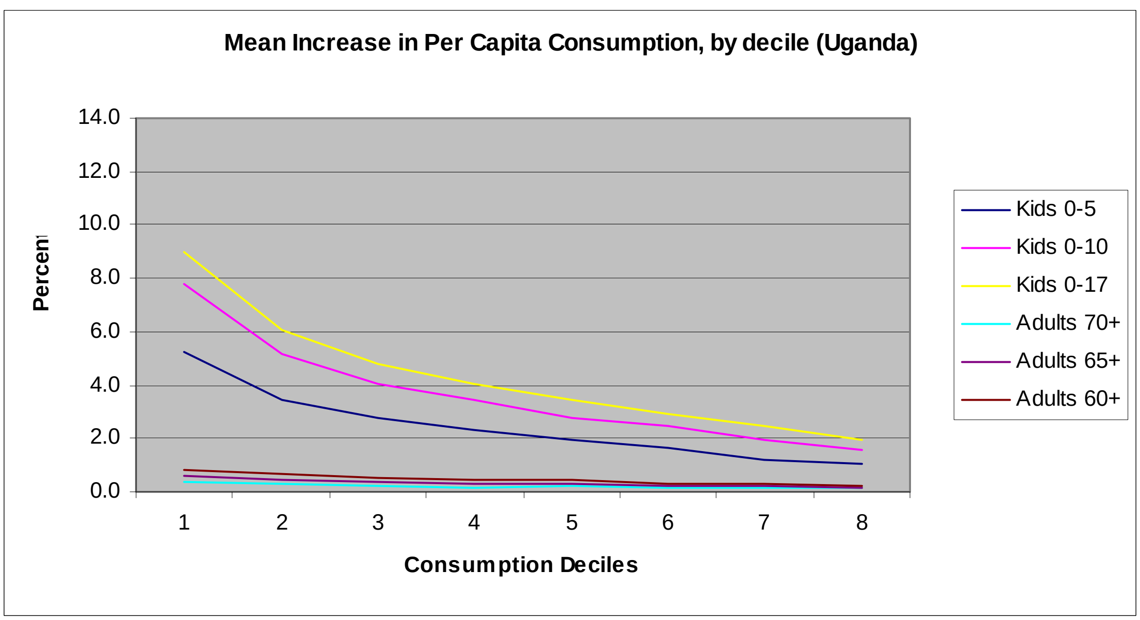
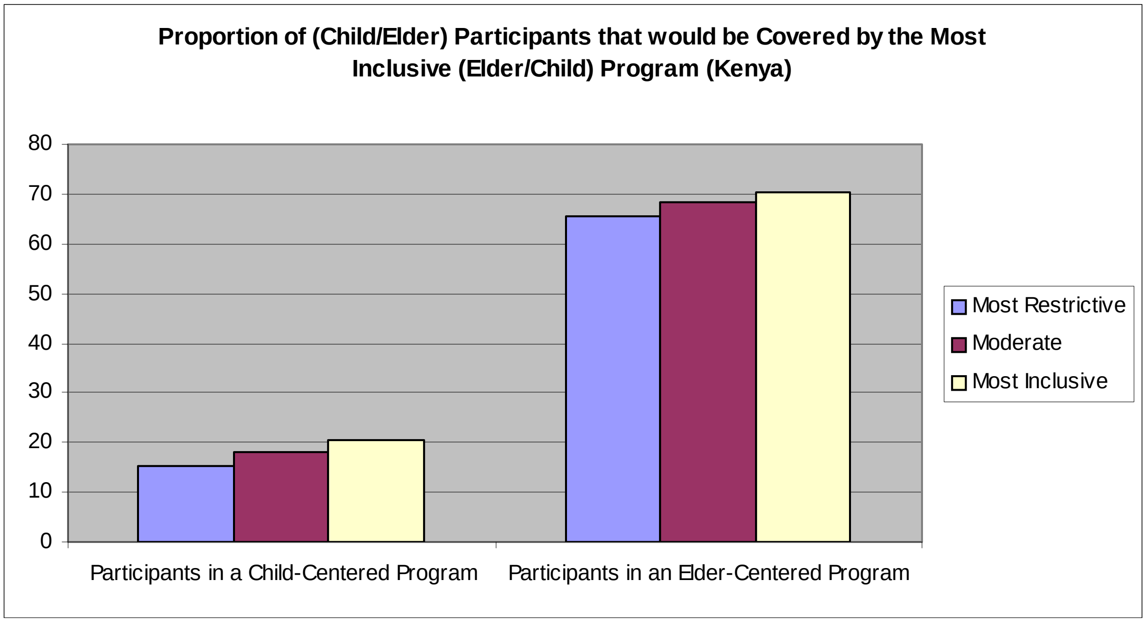


Figure C2: Trade-Offs in Beneficiary Proportions



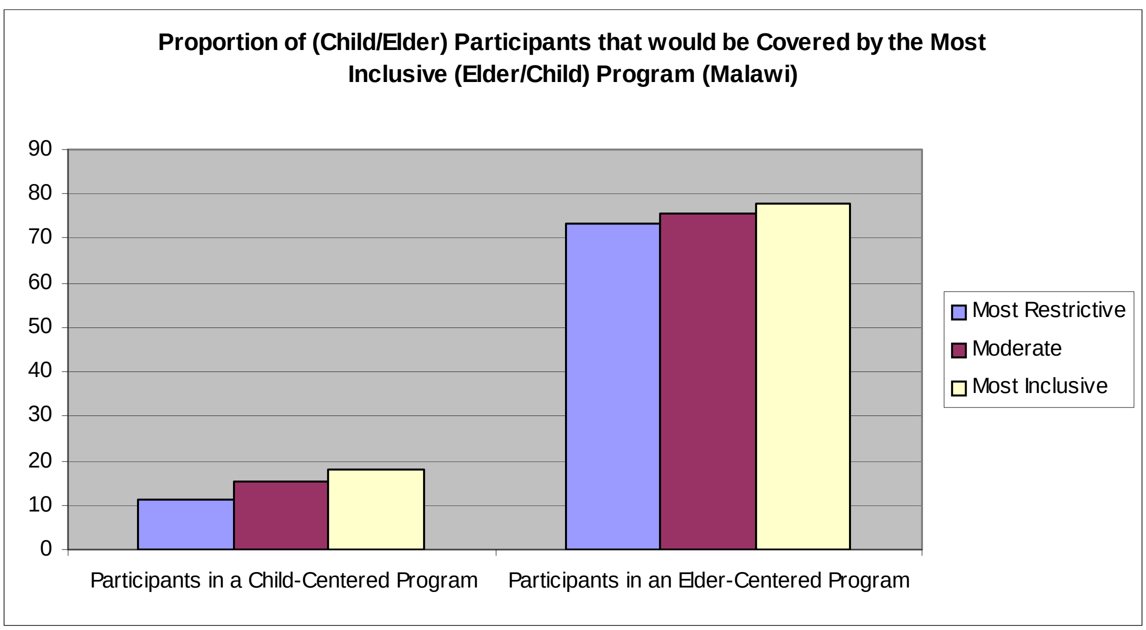


Figure C2: Trade-Offs in Beneficiary Proportions (cont.)