Effects of a large-scale unconditional cash transfer program on mental health outcomes of young people in Kenya: a cluster randomized trial

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Abstract

Purpose: This study investigates the causal effect of Kenya's unconditional cash transfer program on mental health outcomes of young people.

Methods: Selected Locations in Kenya were randomly assigned to receive unconditional cash transfers in the first phase of Kenya's Cash Transfer Program For Orphans And Vulnerable Children (CT-OVC). In intervention Locations, low-income households and those with OVCs began receiving monthly cash transfers of $20 in 2007. In 2011, four years after program onset, data were collected on the psychosocial status for youth aged 15-24 from households in intervention and control Locations (N=1960). The primary outcome variable was an indicator of depressive symptoms using the 10-question Center for Epidemiologic Studies Depression Scale (CES-D10). Logistic regression models that adjusted for individual and household characteristics were used to determine the effect of the cash transfer program.

Results: The cash transfer reduced the odds of depressive symptoms by 24 percent among young persons living in households that received cash transfers. Further analysis by gender and age revealed that the effects were only significant for young men and were largest among the men aged 20-24 years receiving the cash transfer.

Conclusions: This study helps to provide evidence that poverty alleviation programs can improve the mental health of young people in low-income countries and could particularly benefit orphans living in these households. It also suggests that large-scale social cash transfers programs across Africa may have important impacts on the mental health outcomes of young men.

Introduction

Mental disorders account for a significant portion of the global disease burden and are an important indirect cause of many other health conditions including both communicable and non-communicable diseases and injury [1], leading the WHO to proclaim that 'there can be no health without mental health' [2]. Moreover, among young people, neuropsychiatric disorders account for 15-30% of disability-adjusted life years lost in the first three decades of life. The burden of mental health for young people is particularly heavy in low- and middle-income countries (LMIC), where 90% of the world's population of children and adolescents live [3]. Mental health problems, including depression, in adolescence can be particularly damaging because the onset of disorders during this time are more likely to stay with an individual into adulthood. Additionally, mental health problems can impair a young person's development of the social, cognitive, and economic connections and investments that will impact their future success [4]. Given these prevalence estimates and the importance of mental health as an underlying correlate of many dimensions of health, designing adequate responses to the mental health of young people in LMICs is a major issue on the global health policy agenda.

There is increasing evidence that poverty and mental health are inextricably linked in a two-way relationship [5]. The 'social causation' hypothesis posits that poverty represents a risk factor for substance abuse and neurological disorders due to stress, social exclusion, decreased social capital and exposure to trauma and violence [6,7]. According to the 'social drift' hypothesis on the other hand, mental illness increases the risk of poverty due to increased health expenditures, reduced productivity, stigma, and loss of employment and earnings [5,8]. In sub-Saharan Africa (SSA) there is growing use of unconditional or 'social' cash transfer programs as a poverty

alleviation strategy with over a dozen national governments now implementing interventions similar to the Kenyan program. More recently such programs have also been promoted as an intervention that can reach young people as they transition into adulthood, notably having the potential to reduce risky sexual behavior and HIV incidence in high HIV prevalence settings [9–11].

A recent review of the evidence on interventions that address both these causal pathways concluded that the mental health effects of poverty alleviation programs was inconclusive, while the effects of mental health programs on poverty alleviation were mostly associated with improved economic outcomes [12]. The review called for more evidence on the impact of specific poverty alleviation interventions targeted towards vulnerable groups at-risk of mental health disorders, and using so-called 'hard' assessments of mental health.

A total of approximately 12m children in SSA have lost a parent to AIDS and therefore orphans and vulnerable children (OVC) are a population of considerable interest [13]. Becoming orphaned is a risk factor for depression and low mental health [14,15], and this risk may be exacerbated by household poverty. The social causation hypothesis suggests social cash transfer programs, by alleviating poverty and targeting households with OVC (an at risk population), may help to address this problem.

This study examines the effects of a large unconditional cash transfer program, the Government of Kenya's Cash Transfer for Orphans and Vulnerable Children (CT-OVC) Program, on the mental health of young people aged 15-24 years. The CT-OVC program targets households that are poor and have at least one orphan or vulnerable child below 18 years of age. We find that the

Kenyan CT-OVC program might help to improve young people's psychosocial health.

Implications and Contribution Statement

This study helps to provide evidence that poverty alleviation programs can improve the mental health of young people in low-income countries. More specifically it suggests that large-scale social cash transfers programs across Africa may have important impacts on the mental health outcomes of young men and could particularly benefit orphans.

Methods

CT-OVC program and study setting

The CT-OVC program provides regular cash payments of approximately US$20 to households that are poor and have at least one orphan or vulnerable child below 18 years of age. The program is implemented by the Children's Department of the Ministry of Gender, Children and Social Development of the Government of Kenya (GoK) and is the largest social protection program in the country, reaching 170,000 households and approximately 300,000 OVC across Kenya as of January 2014. Details of the program including targeting are shown in Panel 1. Seven districts in Kenya were selected in 2007 to be part of the first phase of the CT-OVC program based on overall poverty, level of development, and OVC prevalence in the districts. Participants in this study were selected during this first phase of the CT-OVC program.

Panel 1: Program Details

Beneficiary Population
Poor households across Kenya containing at least one OVC under 17 years of age. An orphan is defined as any child with at least one deceased biological parent. A vulnerable child is one who is either chronically ill or whose main caregiver is chronically ill. Beneficiary selection is done in two stages. To satisfy the poverty criteria households must display 8 out of 13 characteristics related to welfare such as main material of walls and floors, access to potable water, type of lighting fuel, and ownership of small assets.

Program Expansion and Timing of Impact Evaluation
The pre-pilot phase of the program began in 2004 and initially enrolled 500 households (approximately 3,000 OVC)

in Garissa, Kwale, and Nairobi. The next phase of the pilot program then commenced in 2006 covering 30 districts. After a successful demonstration in the piloting phases, the Government of Kenya (GoK) approved the large-scale expansion of the program to start in 2007 and to reach 100,000 OVC by 2011. Prior to this expansion, the GoK and UNICEF designed the social experiment to track changes in beneficiary households. The evaluation thus began in 2007 with the baseline survey conducted across the seven districts chosen for the study (Kisumu, Migori, Homa Bay, Suba, Nairobi, Garissa and Kwale). Currently, the programme reaches about 160,000 households.

Targeting
In Stage 1, OVC Committees in each Location (an administrative unit consisting of several communities) identify potentially eligible households based on poverty and demographic criteria. In Stage 2, listed households are enumerated by GoK staff to confirm poverty status. Households are then prioritized by age of head, with child-headed households prioritized first followed by older heads.

Intervention
US$20 per month transfer irrespective of household size, paid bimonthly directly to the caregiver. Payment is not conditional on any child or adult behaviors, although caregivers are instructed that receipt of the money is for the care and protection of OVC.

Current Scale and Budget
134,000 households enrolled as of February 2012. FY 2011/12 program budget is KES3.5billion (about US$ 40 million), of which 31 percent is from general tax revenues, 37 percent from development loans and 31 percent from foreign aid donations. The program budget represents less than half a percent of the overall national budget.

Randomization and masking

To evaluate the impacts of the CT-OVC program on various health and economic outcomes, UNICEF and GoK randomly selected Locations – which consists of up to a dozen communities or villages – in the seven districts where the program would be implemented. First, four Locations in each district were identified as eligible to be included in the CT-OVC program, then two Locations in each district were randomly selected for program implementation and the remaining two Locations served as the control group. Randomization was conducted at the level of Location rather than the community because CT-OVC program implementation functions are delegated to the Location and thus it is the lowest administrative level for the program. Targeting of households was conducted according to established program guidelines in all intervention Locations while in control Locations stage one and stage two targeting was implemented in order to identify comparison households (see Panel 1).

Data collection

Household surveys were administered in control and intervention Locations for a baseline assessment in 2007 (wave 1) and follow-up assessments in 2009 (wave 2) and 2011 (wave 3). From the complete list of eligible households in control and intervention Locations, households were randomly selected for in-depth surveys at the rate of 1:2 (control:intervention). Minimum sample sizes were determined on the basis of power calculations (accounting for intra-cluster correlation at the community level) to be able to observe changes of 5% in school enrollment, 20% in curative health care, and 10% in per capita consumption—the three main outcomes for the evaluation of the CT-OVC program. In total 1,540 households were selected from intervention Locations and 754 from control Locations. Households were masked at baseline to reduce the possibility of anticipation effects (where participants change their behavior in anticipation of receiving the transfer).

The wave 3 survey elicited information on health, schooling and household composition – similar to wave 1 and 2 surveys – but also included a young person's module that was administered to up to three household members aged 15-25 years in order to assess mental health, aspirations, sexual behaviors, and other outcomes related to adolescents' well-being. This module included a 10-item short version of the Center for Disease Control Depression Index (CES-D 10) [16,17] and a six-item Hope Scale [18] in order to assess the mental health status of respondents. Data used in the current study come from wave 3, the only wave in which mental health of adolescents was assessed. In the sub-sample for analysis, we excluded 75 participants aged 25 years in 2011 in order to focus on young adults (ages 15-24 years). We also restricted

our analyses to participants who had lived in the household for at least one year (as of 2011) in order to ensure that they were exposed to the intervention.

Ethics statement

All respondents were invited to participate in the survey after receiving an explanation of the study objectives, procedures, risks and benefits. Respondents 18 and above provided written informed consent for their participation. For children ages 15–17, we sought both written informed consent from the parent or main caregiver and from the child. All interviews were conducted by same-sex interviewers in a private place; the interview was terminated if privacy could not be assured. Interviews were conducted in either Luo, Swahili or Somali depending on the region. Study protocols, including consent procedures, were approved by the Kenya Medical Research Institute Ethics Review Committee (Protocol #265) and the Institutional Review Board of the University of North Carolina.

Outcomes

The primary outcome studied was an indicator of whether participants displayed depressive symptoms using the CES-D10 scale. This ten-question scale is based on the longer twenty-question CES-D scale and has been validated with a high internal consistency and reliability in household surveys across a variety of demographic characteristics [16,17]. The short form is not a diagnostic tool but can be used to measure the current level of depressive symptoms by focusing on the affective component of depressed mood. The questions gauge how often certain feelings or behaviors occurred, either “rarely or none of the time” “some or a little of the time” “occasionally or a moderate amount of the time” or “all the time.” Each question receives a score from one to four and then scores are summed across all ten questions to create a scale where

higher scores reflect more depressive symptoms. The scale is adjusted down to a base of zero (range of 0-30) and a score of ≥10 is used to define depressive symptoms. This cutoff was used in a previous study using the CES-D10 in South Africa [19].

We also defined three secondary outcomes. Two variables describing reported physical health were used, one measuring whether the respondent had been healthy in the past month and the second measuring whether he or she was healthier than a year ago. The third outcome, the Hope Scale, was used as another measure of psychosocial health to capture respondents' perception of hope and optimism. Questions assess respondents' perception of their ability to achieve a desired goal taking into account both their awareness of self-agency and available pathways [18]. It has been validated and used in other SSA assessments of child well-being [19-21]. Responses were on a one to five Likert scale (range of 6-30) with higher scores signifying greater optimism. Similar to the CES-D scale, we also converted the Hope Scale into a binary variable to indicate hopefulness, defined as a score ≥median of 22.

Statistical analyses

We examined the effect of living in a CT-OVC beneficiary household on the presence of depressive symptoms among participants who were aged 15-24 years in 2011 (i.e., 11-20 years in 2007, prior to the provision of cash transfers) as well as the secondary outcomes. We estimated logistic regression models that included a binary variable indicating whether the participants resided in a CT-OVC Location (treatment) and adjusted for participant age, sex, the participant's relationship to the household head (child or grandchild), household head characteristics (age, sex, and schooling attainment), an indicator for whether the participant resided in Nairobi and a binary indicator for morbidity status. Finally, we investigated potential

mediators of program impacts on mental health, namely school enrollment and employment. Standard errors were clustered at the household level to account for multiple participants per household. Next we performed analyses separately for males and females aged 15-19 years and 20-24 years. Analyses were conducted using Stata version 12·1.

Results

In the evaluation sample, there were 2,797 youth in the targeted age range (15-25 years), but only the youngest three youth were targeted for the questionnaire from each household. Out of a possible 2,613 eligible individuals, 2,210 responded, an 85 percent response rate. The main reason for non-response was youth being away during data collection, often in boarding school or working. There is a slightly greater response rate from the control group (87 versus 83 percent) that is likely attributable to the positive impact the SCT had on secondary school enrollment [20], meaning more youth from intervention households were away in boarding school. A possible implication of this non-response difference is that if the lower response rate from youth in intervention households is due to boarding school attendance, and boarding school helps to protect a youth's mental health, then the treatment effect might be biased downward. The final sample size used in this study is 1,960 (1,408 treatment, 598 control) after dropping youth that were outside the age range of 15-24 or youth that had not been in the household for at least one year.

Sample characteristics

Table 1 presents characteristics of the households across the three waves of data collection. In general households are extremely poor, with a mean per adult equivalent monthly consumption

of approximately US$22 per month or 60 cents per day. While households are balanced in terms of poverty and household living conditions across the two arms, there are differences in demographic composition. Heads of household in the intervention arm are older, more likely to be female, and have less education. These differences arise because control households were sampled from a slightly larger eligibility list than treatment households due to the prioritization process used by the central Ministry for household selection in treatment Locations when the number of eligible households exceeded the budget. The prioritization process gave the most weight to elderly headed households resulting in these observed differences in heads' characteristics. However, household eligibility is completely supply-driven and take-up is universal, so there is no element of self-selection into the program [8].

Table 1: Household characteristics by data collection period and intervention status

Sample:	**2007**		**2009**		**2011**	
	I	C	I	C	I	C
Demographics						
Household size	5·48	5·79	5·54	5·81	5·53	5·82
Female head	0·65	**0·57**	0·65	**0·59**	0·65	**0·59**
Age of head in years	62·34	**56·06**	62·21	**56·20**	62·55	**56·55**
Head not completed primary	0·53	**0·38**	0·53	**0·38**	0·53	**0·38**
Poverty						
Per adult equiv. monthly consumption (KS)	1533	1501	1542	1460	1550	1442
Walls of mud/dung/grass/sticks	0·75	0·84	0·75	0·86	0·74	0·87
Roof of mud/dung/grass/sticks	0·23	0·22	0·23	0·23	0·22	0·22
Floor of mud/dung	0·66	0·74	0·65	0·77	0·66	0·79
No toilet	0·55	0·56	0·55	0·56	0·54	0·56
Unprotected water source	0·62	0·68	0·61	0·70	0·61	0·70
Observations	1540	754	1325	583	1266	545

Statistically significant (at 10%) differences of t-test between Intervention (I) and Control (C) within each wave shown in bold.

Note also that these patterns remain unchanged in each of the three waves, indicating that attrition from the sample did not change the composition of the sample across the two arms. The determinants of attrition have been explored in detail and reported in Handa et al. [8]. Results

suggest that attrition is driven by the post-election displacement of households after the December 2007 election that affected households in both arms equally. Subsequently, in the first follow-up round of data collection in 2009, attrition reached 17 percent mainly from the districts of Kisumu and Nairobi where election violence was concentrated. This study uses data from the third round of data collection in 2011 and attrition between 2009 and 2011 was only five percent across all study districts.

Table 2 summarizes wave 3 demographic characteristics and mental health outcomes for study participants in intervention and control Locations. Intervention youth are significantly more likely to be orphans and the grandchildren of the household head than the control group. Summary results also show differences in main outcomes. Depressive symptoms were displayed among 33 percent of the sample with no difference among young men and young women. However, comparing intervention and control prevalence, young men in the intervention group have a nine percentage point lower prevalence than the control group (31 percent versus 40 percent) while depression among young women does not differ significantly between groups. Secondary outcomes also reveal significant differences between the two groups—intervention youth are more hopeful (55 percent versus 50 percent) and perceive themselves to be healthier than a year ago (49 percent versus 43 percent). Because of lack of preprogram data on psychosocial outcomes, we also tested whether our main outcome variable for depressive symptoms is correlated with other baseline characteristics. Appendix Table 1 shows that only baseline morbidity is different among those who show depressive symptoms and those who do not at wave 3 and only at $p<.10$. We also compare baseline characteristics between treatment and control groups and find no significant differences.

Table 2. Characteristics of young people age 15-24 in wave 3 (2011) sample

	Total	Intervention	Control	P-value
Demographics				
Age	18·4	18·4	18·6	0·12
Male	0·620	0·60	0·61	0·80
Orphan	0·54	0·56	0·49	0·01
Child of Head	0·49	0·55	0·47	0·00
Grandchild of head	0·30	0·34	0.20	0·00
Female head	0·62	0·63	0·60	0·18
Age of Head in years	60·4	62·0	56·9	0·00
Head any education	0·54	0·53	0·58	0·02
Nairobi residence	0·12	0·14	0·07	0·00
Outcomes				
CES-D ≥ 10	0·334	0·32	0·37	0·02
CES-D ≥ 10 women (N=689)	0·34	0·34	0·33	0·82
CES-D ≥ 10 men (N=1129)	0·34	0·31	0·40	0·00
HOPE	0·54	0·56	0·5	0·02
No illness/injury past 4 weeks	0·73	0·72	0·74	0·27
Healthier than year ago	0·50	0·49	0·43	0·02
Observations	2006	1408	598	

CES-D ≥10 binary indicator for scoring a 10 or above on the CES-D depression scale. HOPE a binary indicator for scoring at above the median on the Hope scale.

Program impacts on depressive symptoms

The results in Table 3 indicate that the receipt of unconditional cash transfers contributed to significantly lower prevalence of depressive symptoms among young men in particular. Among the combined sample of youth aged 15-24 years, the CT-OVC program was associated with a reduction in the likelihood of having depressive symptoms, significant at the 5 percent confidence level only (odds ratio [OR] 0.79; 95% CI 0.63,0.99). After adjusting for participant and household characteristics, the effect of the CT-OVC program remains similar and significant (adjusted odds ratio [AOR] 0.76; 95% CI 0.60,0.96). The effect size among young men is considerably larger and statistically significant at the 0.1 percent level [AOR 0.60; 95% CI

0.45,0.81], whereas for young women the CT-OVC program did not reduce the likelihood of depressive symptoms [AOR 1.07; 95% CI 0.75,1.54]. Other results in Table 3 indicated that the likelihood of depressive symptoms is higher in general among young men residing in Nairobi [AOR 2.29; 95% CI 1.54,3.41].

Table 3. Unadjusted and adjusted logistic regressions showing effect of the intervention on likelihood of having CES-D≥10 (reported for all individuals 15-24 years and separately for males and females).

	Full sample		**Males**		**Females**	
	(1)	(2)	(3)	(4)	(5)	(6)
Intervention	0.79*	0.76*	0.67**	0.60***	1.04	1.07
	[0.63,0.99]	[0.60,0.96]	[0.51,0.89]	[0.45,0.81]	[0.74,1.45]	[0.75,1.54]
Age		1.08**		1.04		1.14***
		[1.03,1.14]		[0.97,1.11]		[1.06,1.23]
Male		1.01				
		[0.82,1.23]				
Orphan		1.04		0.98		1.15
		[0.79,1.36]		[0.68,1.41]		[0.76,1.75]
Child		0.92		1		0.89
		[0.72,1.19]		[0.70,1.43]		[0.62,1.29]
Grandchild		0.95		1.09		0.79
		[0.69,1.29]		[0.73,1.64]		[0.49,1.28]
No illness/injury past 4 weeks		0.79*		0.78		0.8
		[0.64,0.99]		[0.58,1.04]		[0.57,1.14]
Female head		1		1.28		0.69*
		[0.79,1.26]		[0.95,1.73]		[0.48,0.98]
Age of head		1		1		0.99
		[0.99,1.00]		[0.99,1.01]		[0.98,1.00]
Head has education		0.82		0.84		0.79
		[0.65,1.04]		[0.63,1.12]		[0.55,1.14]
Nairobi		1.44*		2.29***		0.82
		[1.04,2.00]		[1.54,3.41]		[0.50,1.35]
Observations	2006	1960	1209	1187	797	773
Chi2	4.02	34.78	7.76	35.44	0.04	26.33
P-value	0.04	0	0.01	0	0.84	0

95% confidence intervals in brackets; *** p<0.001, ** p<0.01, * p<0.05

Table 4 divides the sample by both gender and age and shows that the effect of the CT-OVC program is largest among young men aged 20-24 years [AOR 0.50; 95% CI 0.31,0.82]. In contrast, the CT-OVC program led to a higher risk of depressive symptoms among young women aged 20-24 years, though the effect is not statistically significant [AOR 1.44; 95% CI 0.77,2.71].

Table 4. Adjusted odds ratio by age and sex categories on likelihood of having CES-D≥10

	Males 15-19	Males 20-24	Female 15-19	Female 20-24
Intervention	0.50**	0.65*	1.44	0.93
	[0.31,0.82]	[0.45,0.92]	[0.77,2.71]	[0.61,1.41]
Orphan		0.75		0.98
		[0.48,1.17]		[0.60,1.60]
Child	0.72	1.19	0.74	0.96
	[0.42,1.24]	[0.75,1.90]	[0.42,1.30]	[0.59,1.55]
Grandchild	0.89	1.21	0.39	0.9
	[0.45,1.75]	[0.74,1.98]	[0.14,1.07]	[0.52,1.58]
No illness/injury past 4 weeks	0.78	0.78	0.96	0.77
	[0.45,1.35]	[0.55,1.10]	[0.53,1.73]	[0.51,1.17]
Female head	1.09	1.52*	0.51*	0.87
	[0.65,1.82]	[1.05,2.20]	[0.29,0.90]	[0.56,1.34]
Age of head	1	1	0.99	1
	[0.99,1.01]	[0.99,1.01]	[0.97,1.00]	[0.99,1.01]
Head has education	0.79	0.84	0.9	0.76
	[0.48,1.29]	[0.60,1.18]	[0.49,1.66]	[0.50,1.17]
Nairobi	4.57***	1.24	0.66	1
	[2.52,8.28]	[0.66,2.32]	[0.34,1.29]	[0.53,1.89]
Observations	386	801	240	533
Chi2	8	9	8	9
P-value	28.88	17.52	16.51	3.09

95% confidence intervals in brackets; *** p<0.001, ** p<0.01, * p<0.05

Sensitivity analysis

We ran additional analyses to see if the results were sensitive to the CES-D cut-off of 10 that we used. Using lower cutoffs of 8, 9, and a higher cutoff of 11 reveal only very slight changes to the AOR (results available upon request). In addition, we performed sensitivity analyses by

including 25 years olds, and the newest members (under a year in the household). Our findings were robust to these alternative model specifications and the same pattern of results was seen for males and females. Finally we performed analyses for orphans and non-orphans separately, and find strong protective effects of the CT-OVC among orphans (who represent 54 percent of the sample) [AOR: 0.65; 95% CI: 0.48, 0.89] but not on non-orphans. In keeping with the strong impacts found among males, both non-orphan and orphan males display significant positive treatment effects [non-orphan (AOR:0.62; 95% CI: 0.41,0.92); orphan (AOR: 0.58; 95% CI: 0.39, 0.86)] while there are no significant impacts for females in either group.

Program impacts on secondary outcomes

Table 5 reports the effects of the CT-OVC program on the three secondary outcomes, stratified by gender. Consistent with the previous results, the CT-OVC program led to a statistically significant improvement for young men in two of the three secondary outcomes. For young men, residing in an intervention household increased the likelihood of feeling healthier from a year ago [AOR 1.41; 95% CI 1.05,1.88] and having ≥ median score in the Hope scale [AOR 1.59; 95% CI 1.22,2.07]. Among young women, the effects of the CT-OVC program were not statistically significant. Finally, intervention effects on being healthy in the past 4 weeks were not statistically significant for young men [AOR 0.93; 95% CI 0.68,1.26] or young women [AOR 0.84; 95% CI 0.57,1.24]. Results are consistent when we limit the sample to orphans only (results available upon request), however, non-orphans young men seem to be healthier.

Table 5. Effect of intervention on other health outcomes (adjusted odds ratio are reported)

	Male				Female		
	Been healthy in past 4 weeks	Healthier than 1 year ago	Hope score above median		Been healthy in past 4 weeks	Healthier than 1 year ago	Hope score above median
Treatment	0.93	1.41*	1.59***		0.84	1.07	0.96
	[0.68,1.26]	[1.05,1.88]	[1.22,2.07]		[0.57,1.24]	[0.74,1.56]	[0.68,1.36]
Age	1.01	0.97	1.01		1.01	0.95	0.89**
	[0.94,1.09]	[0.92,1.03]	[0.95,1.07]		[0.93,1.09]	[0.89,1.03]	[0.83,0.96]
Orphan	1.02	1.04	1.05		1.08	1.18	0.97
	[0.69,1.50]	[0.75,1.44]	[0.76,1.44]		[0.72,1.64]	[0.80,1.75]	[0.66,1.44]
Child	0.99	1.01	1.21		1.17	1.05	1.57*
	[0.68,1.45]	[0.71,1.44]	[0.88,1.67]		[0.78,1.77]	[0.73,1.52]	[1.11,2.22]
Grandchild	0.89	0.92	1.26		0.94	1.21	1.21
	[0.57,1.38]	[0.61,1.39]	[0.87,1.83]		[0.58,1.52]	[0.76,1.90]	[0.78,1.88]
Female head	0.84	0.78	0.74*		0.55**	0.68*	0.82
	[0.61,1.16]	[0.58,1.06]	[0.57,0.98]		[0.37,0.81]	[0.48,0.97]	[0.58,1.16]
Head age	1	0.99*	0.99*		1	0.99	1
	[0.99,1.00]	[0.98,1.00]	[0.99,1.00]		[0.99,1.01]	[0.98,1.00]	[0.99,1.01]
Head has education	0.83	0.75	0.89		0.54**	0.94	1.51*
	[0.60,1.13]	[0.56,1.00]	[0.69,1.16]		[0.37,0.79]	[0.67,1.33]	[1.07,2.14]
Nairobi	1.96*	0.98	0.85		1.62	0.99	1
	[1.13,3.39]	[0.60,1.59]	[0.56,1.28]		[0.97,2.70]	[0.62,1.59]	[0.63,1.59]
Observations	1187	1192	1193		773	776	781
Chi2	9	9	9		9	9	9
P-value	0.4	0.07	0.02		0.04	0.17	0

95% confidence intervals in brackets; *** p<0.001, ** p<0.01, * p<0.05

Mediation

We also investigated the potential mediators of school enrollment and employment to see if they explain the mental health impact of cash transfers and the gender difference in the impact Results of mediation analysis are found in Appendix Table 2. First, we find that for our sample neither schooling nor hours worked mediate the relationship between the cash transfer and mental health. However, the CT-OVC program did have a strong positive impact on secondary school enrollment [23], which could help to explain improvement in mental health if schooling is protective of mental health. Employment, on the other hand, could have a negative impact on

mental health outcomes if it keeps youth from school or introduces greater stress in their lives. The results indicate that schooling is more strongly associated with depression than is employment. However, while the cash transfer program does lead to higher schooling in both males and females, this effect on schooling does not mediate the relationship between cash transfers and mental health.

Discussion and Conclusion

This is the first study to show the impacts of a large-scale government implemented unconditional cash transfer program on mental health outcomes of youth. We find that program participation is associated with better mental health outcomes, but these findings are concentrated in young men, and strongest among older males 20-24. Young men living in households that received unconditional cash transfers were less likely to show depressive symptoms, more likely be hopeful about their lives, and more likely to feel healthier than they did previously. The positive impact of the program is stronger among the sub-group of orphans, who make up 54 percent of the sample. Female household heads seem to have a slight protective effect, but mainly among young women and for secondary outcomes. Nairobi residence, on the other hand, has a strong negative impact on mental health for young men.

Results from the Hope Scale follow the same pattern of the CES-D10 with positive impacts for young men in treatment households but no significant impacts for females. However, the significant difference between orphan and non-orphan males seen for our depressive measure dissolved for Hope. Both orphan and non-orphan males from treatment households had positive and significant impact on their Hope scores. In South Africa, studies using the Hope Scale have

also found no difference between orphans and non-orphan children Hope Scale scores [20] but also that socioeconomic status (SES) does not moderate the relationship between Hope and general psychosocial well-being [21]. This latter result suggests that SES does not play a very significant role in greater psychosocial well-being in the presence of Hope, although this might be explained by the fact that most of that sample is considered to have average or higher SES. Our sample of young people living in very poor households, on the other hand, seems to receive an important psychosocial benefit even from a slight increase in family SES.

This paper extends the literature on the effects of social cash transfer programs and provides empirical support for the hypothesis that poverty alleviation programs can improve mental health outcomes. The results are consistent with the positive impacts that the CT-OVC program had on other measures of individuals' and households' well-being, including secondary school enrollment [23], food consumption, and diet diversity [24]. One existing study also found positive impacts (which dissipated after program termination) of a small, localized conditional cash transfer program targeting adolescent females in Malawi [25], but the current study is the first to examine the impacts of a cash transfer program on both males and females and provides evidence from a government-run, scaled-up program, and therefore has much greater external validity. Furthermore, the study in Malawi did find positive program impacts on mental health among girls, while in our study there were no statistically significant impacts among girls. Differences in the details of the cash transfer program in Malawi and Kenya may explain why no effects on mental health outcomes of young women were found in this study. For example, transfers were provided to caregivers and not adolescents in Kenya, whereas in Malawi some of the transfers were provided directly to adolescent girls and the cash was conditional on school

enrollment. Since the effects of cash transfers on mental health outcomes of adolescent boys were not studied in the Malawi study, it is not possible to directly compare our results for young men to their findings. Previous research from Latin America, where cash transfers tend to be conditional (i.e., tied to specific behaviors of program participants) unlike in Africa, have found only limited evidence of effects on mental health outcomes. These studies have not shown that cash transfer programs (which are typically conditional on schooling attendance) can improve maternal mental health in one to two year time frames [26,27], although the *Oportunidades* program in Mexico found significant improvements in maternal mental health after three and half to five years of receiving transfers [28].

The observed pattern of gender differences in prevalence of depression is a widely recognized phenomenon [29,30]. Other studies have shown that women are more likely to be depressed and that this divide is more pronounced during adolescence [31,32]. From our results, it seems likely that young men and women differ in complexity or depth of their depressive symptoms, and that the unconditional cash transfers are more effective in reducing depression among young men rather than among young women, and among orphans.

Limitations

There are several limitations of this study that merit discussion. First, we do not have baseline (pre-program) data on youth so conclusions about the causal effect of the cash transfer program rest on the assumption of baseline equivalence between intervention and control groups. This limitation is mitigated by the randomization to the cash transfer program and the baseline equivalence of poverty status of households, a key program eligibility criterion. Additionally,

household level baseline characteristics are not different between individuals above and below the CES-D cutoff.

The imbalance in orphan prevalence between treatment and control groups is also a limitation of the study. While family poverty constitutes an important risk factor for children's mental health functioning, so too is the shock of losing a parent. There is evidence that orphans, particularly AIDS-affected orphans, are more likely to have increased levels of anxiety and depression [14,15]. Indeed we observe a strong, robust impact of the cash transfer on depressive symptoms among orphans and no effects on non-orphans, suggesting that in fact income can have an independent impact on mental health. This evidence is in line with a randomized study from Uganda that found positive impacts of a microfinance intervention on the mental health of AIDS orphans [33]. In this case, it was also a poverty reduction intervention that was attributed for the benefit to orphan's psychosocial functioning.

A second limitation is that the young people from our sample are not representative of a sub-sample of the general poor in Kenya because the program specifically targets children that have experienced parental loss. This limits the generalizability of the findings for other interventions not targeted to the OVC population. Nevertheless, our findings will be an important addition because the effects of large-scale unconditional cash transfer programs on mental health outcomes of young persons have not been assessed despite their prominence as a social protection strategy in SSA and their theoretical basis for affecting mental health. Moreover, many countries in Southern Africa (e.g. Malawi, Zambia, Zimbabwe) target 'labor-constrained' households, which, similar to the Kenya CT-OVC, also contain large numbers of OVC.

Another limitation of the study is the potential measurement error in the indicator of depression using the CES-D scale, especially when translated into the local languages. This limitation is not likely to bias the results if the measurement error is likely to have applied equally to both study groups. Further research is required in order to achieve a better understanding on why cash transfer and poverty alleviation programs such as the one implemented in Kenya differentially affected the mental health outcomes of men and women.

Conclusion

This study provides novel evidence on the mental health impacts of young persons from a large-scale poverty alleviation programs that use unconditional cash transfers. A number of countries in sub-Saharan Africa now implement large-scale cash transfer programs that have similar objectives and features as Kenya's CT-OVC program (e.g. Zambia, Ghana, Zimbabwe and Malawi) [34]. Results reported here show that poverty-targeted unconditional cash transfer programs can impact the health and economic well-being of young people and can potentially help address the significant burden of mental disorders in low-income countries. Further study of the mental health effects of cash transfer programs in other countries as well as additional investigation of gender differences in the mental health effects should be important priorities for future research.

References

1. Prince M, Patel M, Saxena S, et al. No health without mental health. The Lancet 2007; 370 (9590): 859–877.
2. World Health Organization, Department of Mental Health and Substance Abuse, Victorian Health Promotion Foundation, and University of Melbourne. Promoting mental health: concepts, emerging evidence, practice : Summary report. Geneva: World Health Organization, 2004.
3. Kieling C, Baker-Henningham H, Belfer M, et al. Child and adolescent mental health worldwide: evidence for action. The Lancet 2011; 378(9801): 1515–1525.
4. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. The Lancet 2007; 369(9569): 1302-1313.
5. Lund C, Breen A, Flisher AJ, et al. Poverty and common mental disorders in low and middle income countries: a systematic review. Social science & medicine 2010;71(3): 517-528.
6. Flisher AJ, Lund C, Funk M, et al. Mental health policy development and implementation in four African countries. Journal of Health Psychology 2007;12(3): 505–516.
7. Patel V, Kleinman A. Poverty and common mental disorders in developing countries. Bulletin of the World Health Organization 2003;81(8): 609–615.
8. Saraceno B, Barbui C. Poverty and mental illness. Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie 1997; 42(3): 285–290.
9. Handa S, Halpern CT, Pettifor A, Thirumurthy H. The Government of Kenya's Cash Transfer Program reduces the risk of sexual debut among young people age 15-25. PLoS ONE 2014; 9(1): e85473. doi: 10.1371/journal.pone.0085473
10. Pettifor A, MacPhail C, Nguyen N, Rosenberg M. Can money prevent the spread of HIV? A review of cash payments for HIV prevention. AIDS and Behavior 2012; 16(7): 1729-1738.

11. Baird S, Garfein R, McIntosh C, Ozler B.Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. Lancet 2012; 379(9823): 1320–1329.
12. Lund C, De Silva M, Plagerson S, et al. Poverty and mental disorders: breaking the cycle in low-income and middle-income countries. The Lancet 2011; 378(9801): 1502–1514.
13. Joint United Nations Programme on HIV/AIDS (UNAIDS). Report on the global AIDS epidemic. Geneva: UNAIDS, 2008.
14. Cluver L, Gardner F. Risk and protective factors for psychological well-being of children orphaned by AIDS in Cape Town: A qualitative study of children and caregivers' perspectives. AIDS Care 2007; 19(3): 318–325.
15. Cluver L, Gardner F, Operario D. Psychological distress amongst aids-orphaned children in urban South Africa. Journal of Child Psychology and Psychiatry, and Allied Disciplines 2007; 48(8): 755–763.
16. Radloff L. The CES-D Scale: A self-Report depression scale for research in the general population. Applied Psychological Measurement 1997; 1(3): 385–401.
17. Andresen, E, Malmgren J, Carter W, Patrick D. Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). American Journal of Preventive Medicine 1994; 10: 77–84.
18. Snyder C, Hoza B, Pelham W, et al. The development and validation of the Children's Hope Scale. Journal of Pediatric Psychology 1997; 22(3): 399–421.
19. Ardington C, Case A. Health: Analysis of the NIDS wave 1 dataset (no. 2). University of Cape Town: Southern Africa Labour and Development Research Unit, 2008.
20. Senefeld S, Strasser S, Campbell J, Perrin P. Measuring Adolescent Well-being: The Development of a standardized measure for adolescents participating in orphans and vulnerable children programming. Vulnerable Children and Youth Studies 2011; 6: 346–359.
21. Adamson M, Roby J. Parental loss and hope among orphaned children in South Africa: A pilot study. Vulnerable Children and Youth Studies 2011; 6(1): 28-38.

22. Guse T, Vermaak Y. Hope, psychosocial well-being and socioeconomic status among a group of South African adolescents. Journal of Psychology in Africa 2011; 21(4): 527-533.
23. Kenya CT-OVC Evaluation Team. The impact of the Kenya CT-OVC Program on human capital. Journal of Development Effectiveness 2012; 4: 38-49.
24. The Kenya CT-OVC Evaluation Team. The impact of the Kenya Cash Transfer Program for Orphans and Vulnerable Children on household spending. Journal of Development Effectiveness 2012; 4(1): 9–37.
25. Baird S, De Hoop J, Özler B. Income shocks and adolescent mental health. Journal of Human Resources 2013; 48(2): 370-403.
26. Paxson C, Schady N. Does money matter? The effects of cash transfers on child health and development in rural Ecuador. Impact Evaluation Series. Washington DC: The World Bank, 2007.
27. Macours K, Norbert S, Renos V. Cash transfers, behavioral changes, and cognitive development in early childhood: Evidence from a randomized experiment. American Economic Journal: Applied Economics 2012; 4(2): 247-273.
28. Ozer E, Fernald L, Weber A, et al. Does alleviating poverty affect mothers' depressive symptoms? A quasi-experimental investigation of Mexico's Oportunidades programme. International Journal of Epidemiology 2011; 40:1565–1576.
29. Nolen-Hoeksema S. Gender differences in depression. Current directions in psychological science 2001; 10: 173-176.
30. Weissman M, Bland R, Canino G, et al. Cross-national epidemiology of major depression and bipolar disorder. JAMA 1996; 276(4): 293-299.
31. Nolen-Hoeksema S, Girgus J. The emergence of gender differences in depression during adolescence. Psychological bulletin 1994; 115(3): 424-443.
32. Piccinelli M, Wilkinson G. Gender differences in depression critical review. The British Journal of Psychiatry 2000; 177(6): 486-492.

33. Ssewamala F, Neilands T, Waldfogel J, Ismayilova L. The impact of a comprehensive microfinance intervention on depression levels of AIDS-orphaned children in Uganda. Journal of Adolescent Health 2012; 50(4): 346-352.
34. Niño-Zarazúa M, Barrientos A, Hickey S, Hulme D. Social protection in Sub-Saharan Africa: Getting the politics right. World Development 2012; 40(1): 163-176.

Appendix

Appendix Table 1: Baseline characteristics by Young People Above and Below CES-D10 Cutoff of 10

Baseline Characteristics	Below cutoff	Above Cutoff	p-value
Observations	969	490	
Age	17.4	16.8	0.23
Male	0.62	0.62	0.91
Orphan	0.57	0.58	0.74
Nairobi	0.11	0.13	0.24
Child	0.55	0.58	0.27
Grandchild	0.27	0.25	0.30
Head's highest grade attained	3.64	3.76	0.63
Head any education	0.56	0.53	0.33
Currently working	0.23	.24	0.81
Disabled	0.03	0.04	0.71
No illness/injury in past 4 weeks	0.12	0.08	0.05
Chronic illness	0.05	0.03	0.22

Appendix Table 2. Effect of cash transfer on CES-D controlling for possible mediating variables of schooling and work

	Full Sample				**Young Women**				**Young men**			
	1	2	3	4	1	2	3	4	1	2	3	4
Intervention	0.75*	0.77*	0.76*	0.94*	0.98	1.09	1.07	1.02	0.65*	0.61**	0.61***	0.89**
	[0.57,0.99]	[0.61,0.98]	[0.60,0.97]	[0.89,0.99]	[0.64,1.49]	[0.76,1.57]	[0.75,1.54]	[0.94,1.10]	[0.46,0.93]	[0.45,0.82]	[0.45,0.82]	[0.84,0.96]
Enrolled in school	0.72*				0.69				0.75			
	[0.54,0.97]				[0.43,1.11]				[0.50,1.12]			
School attainment (standard 8)		0.65**				0.68				0.65*		
		[0.50,0.85]				[0.45,1.02]				[0.46,0.92]		
Worked			1.19				1.18				1.18	
			[0.88,1.62]				[0.63,2.19]				[0.82,1.69]	
Total hours worked per week				1				1.01				1
				[1.00,1.01]				[0.99,1.02]				[1.00,1.01]
Age	1.14**	1.07*	1.08**	1.02**	1.26**	1.13**	1.14**	1.03**	1.08	1.03	1.03	1.01
	[1.04,1.25]	[1.02,1.12]	[1.02,1.13]	[1.01,1.03]	[1.09,1.46]	[1.04,1.22]	[1.05,1.23]	[1.01,1.05]	[0.96,1.21]	[0.96,1.10]	[0.96,1.11]	[0.99,1.02]
Male	1.12	1.04	0.99	1								
	[0.88,1.44]	[0.85,1.27]	[0.81,1.21]	[0.96,1.05]								
Orphan	0.86	1.05	1.04	1.01	1.04	1.15	1.15	1.04	0.74	0.99	0.98	1
	[0.62,1.20]	[0.80,1.38]	[0.79,1.37]	[0.95,1.07]	[0.63,1.71]	[0.75,1.75]	[0.76,1.75]	[0.95,1.13]	[0.48,1.16]	[0.69,1.43]	[0.68,1.42]	[0.92,1.08]
Child	1.13	0.93	0.92	0.98	1.18	0.94	0.89	0.97	1.13	0.96	1	1.01
	[0.81,1.57]	[0.72,1.20]	[0.71,1.19]	[0.93,1.04]	[0.71,1.97]	[0.65,1.37]	[0.62,1.29]	[0.90,1.06]	[0.71,1.81]	[0.67,1.37]	[0.70,1.43]	[0.93,1.09]
Grandchild	1.17	0.98	0.94	0.99	1.16	0.84	0.79	0.94	1.2	1.09	1.09	1.02
	[0.80,1.72]	[0.71,1.34]	[0.69,1.29]	[0.92,1.06]	[0.64,2.12]	[0.52,1.37]	[0.49,1.27]	[0.85,1.04]	[0.73,1.98]	[0.73,1.63]	[0.73,1.63]	[0.94,1.12]
No illness/injury past 4 weeks	0.77	0.78*	0.80*	0.95*	0.73	0.78	0.81	0.95	0.77	0.76	0.77	0.95
	[0.59,1.00]	[0.62,0.97]	[0.64,1.00]	[0.90,1.00]	[0.48,1.12]	[0.55,1.11]	[0.57,1.15]	[0.88,1.03]	[0.54,1.09]	[0.57,1.02]	[0.58,1.04]	[0.89,1.01]
Female head	1.2	0.99	0.98	1	0.81	0.68*	0.68*	0.92*	1.52*	1.27	1.26	1.05
	[0.90,1.61]	[0.78,1.25]	[0.77,1.25]	[0.95,1.05]	[0.52,1.26]	[0.47,0.97]	[0.48,0.97]	[0.85,0.99]	[1.05,2.20]	[0.94,1.72]	[0.94,1.71]	[0.99,1.12]
Age of head	1	1	1	1	1	0.99	0.99	1	1	1	1	1
	[0.99,1.01]	[0.99,1.00]	[0.99,1.00]	[1.00,1.00]	[0.99,1.01]	[0.98,1.00]	[0.98,1.00]	[1.00,1.00]	[0.99,1.01]	[0.99,1.01]	[0.99,1.01]	[1.00,1.00]

Head has education	0.84	0.86	0.82	0.96	0.79	0.85	0.78	0.95	0.85	0.87	0.83	0.96
	[0.64,1.10]	[0.68,1.09]	[0.65,1.03]	[0.91,1.01]	[0.51,1.23]	[0.58,1.23]	[0.54,1.13]	[0.88,1.03]	[0.60,1.19]	[0.65,1.15]	[0.62,1.11]	[0.90,1.02]
Nairobi	1.12	1.51*	1.43*	1.10*	1.02	0.86	0.81	0.97	1.18	2.35***	2.28***	1.22***
	[0.70,1.78]	[1.08,2.09]	[1.03,1.99]	[1.01,1.19]	[0.53,1.97]	[0.52,1.42]	[0.49,1.34]	[0.87,1.08]	[0.62,2.21]	[1.58,3.50]	[1.53,3.39]	[1.11,1.34]
N	1334	1960	1960	1947	533	773	773	768	801	1187	1187	1179
Chi2	33.8	47.01	37.03		20.19	29.68	26.73		21.1	41.48	36.15	
p	0	0	0	0	0.04	0	0.01	0	0.03	0	0	0
95% confidence intervals in brackets; *** p<0.001, ** p<0.01, * p<0.05												