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# Effects of a large-scale unconditional cash transfer program on mental health outcomes of young people in Kenya

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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). Secondary outcomes include Hope and physical health measures. Logistic regression models that adjusted for individual and household characteristics were used to determine the effect of the cash transfer program.

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**Conflicts of Interest:** There are no conflicts to report for any authors.

**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 larger among men aged 20-24 and orphans.

**Conclusions—**This study provides evidence that poverty targeted unconditional cash transfer programs, can improve the mental health of young people in low-income countries.

## Keywords

Cash Transfers; adolescent mental health; Kenya

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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 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 challenges 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 more at-risk of mental health disorders and using so-called 'hard' assessments of mental health that implement screening tools for certain disorders.

Becoming orphaned is an important risk factor for depression and low mental health [13,14], and this risk may be exacerbated by household poverty. In SSA, a total of approximately 12m children have lost a parent to AIDS; therefore orphans and vulnerable children (OVC) are a population of considerable interest [15,16]. The social causation hypothesis suggests unconditional 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. Unconditional cash transfer programs provide consistent cash payments to targeted households without any behavioral conditions and are most common in SSA, while conditional programs provide cash contingent on health or school related behaviors and are more common in Latin America. The CT-OVC program targets households that are poor and have at least one orphan or vulnerable child below 18 years of age (see Panel 1).

## 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 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 as of January 2014 (Appendix Panel 1).

Select Locations within each of 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 from these Locations during this phase of the CT-OVC program. Control Locations were scheduled to enter the program later in the scale-up process, though to date they have yet to be enrolled.

### Randomization and masking

Due to financial constraints not all Locations in the seven districts could enter the program immediately thus allowing for the possibility of experimental evaluation design. 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 (Appendix Panel 1). Additionally, households were masked at baseline to reduce the possibility of anticipation effects (where participants change their behavior in anticipation of receiving the transfer).

That is, neither the household nor the field enumerators were aware of the household's assigned study arm during baseline data collection.

## 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.

Data used in the current study come from wave 3, the only wave in which mental health of adolescents was assessed. The wave 3 survey 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, and sexual behaviors. This module included a 10-item short version of the Center for Disease Control Depression Index (CES-D 10) [17,18] and a six-item Hope Scale [19] in order to assess the mental health status of respondents. In our analysis, we excluded 75 participants aged 25 years in 2011 in order to focus on young adults (ages 15-24 years) and restricted the sample 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. The study was not originally powered to assess program impacts on mental health as this was not a primary outcome of the CT-OVC.

## Ethics statement

All interviews were conducted by same-sex interviewers in a private place; the interview was terminated if privacy could not be assured. Respondents 18 and above provided written informed consent for their participation. For children ages 15–17, we sought written informed consent from the parent or main caregiver and from the child. 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 a binary indicator of whether participants displayed depressive symptoms using the CES-D10 scale. The CES-D10 is 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 [17,18]. The short form is not a diagnostic tool but is considered a 'hard assessment' of mental health because it is 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, on a one to four Likert scale from "rarely"

to "all the time." 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 previous studies using the CES-D10 in African settings [20-22].

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 [19]. It has been validated and used in other SSA assessments of child well-being [23-25]. 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 (except for physical health outcomes). 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 as adolescence is limited to age 19 and under [26] and to test whether the determinants of mental health could be different for males and females [1]. Finally, we investigated potential mediators of program impacts on mental health, namely school enrollment and employment. Analyses were conducted using Stata version 13.

## Results

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 CT-OVC had on secondary school enrollment [27]. We ran multiples checks to understand the implications of non-response including characteristics of both the youth and household head, but find the only significant difference is that non-respondents were four percentage points more likely to be enrolled in school relative to respondents (66 versus 62 percent) suggesting more youth from intervention households were away in boarding school. If the lower response rate in intervention households is due to boarding school attendance, a possible implication

of this non-response difference is that the treatment effect might be biased downward if schooling helps to protect a youth's mental health [28]. 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 who 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. 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 the central Ministry prioritized elderly headed households since there were very few child headed households in treatment Locations, and therefore, control households were sampled from a slightly larger eligibility list. However, household eligibility is completely supply-driven and take-up is universal, so there is no element of self-selection into the program [8]. Appendix Panel 2 describes household attrition.

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. The larger proportion of males in the sample mirrors the proportion of males age 11-21 at baseline and suggests that the type of households targeted by the CT-OVC are more likely to house male OVC. Depressive symptoms were displayed among 33 percent of the sample with no difference among young men and young women. Comparing intervention and control prevalence, however, 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. We find that only baseline morbidity is different among those who show depressive symptoms and those who do not at wave 3 and only at $p<.10$ (Appendix Table 1).

### 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 indicate that the likelihood of depressive symptoms is higher in general among young men residing in Nairobi.

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.

### Sensitivity analysis

We ran additional analyses to see if results were sensitive to our using a cut-off of 10. Using lower cutoffs of 8, 9, and a higher cutoff of 11 reveal only very slight changes to the AOR (results available upon request). Moreover, we ran analysis using the continuous measure of the CES-D10 and found that the CT-OVC also affects severity of depression and not just caseness. 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 or young women. Results are consistent when we limit the sample to orphans only (results available upon request), however, non-orphan young men seem to be healthier.

### 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 [27] (among 13-17 year-olds). 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 national unconditional cash transfer program on mental health outcomes of youth. We find that program participation is associated with better mental health outcomes, and these findings are concentrated in young men, and strongest among older males 20-24 and orphans. 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 be healthier than they were previously. The positive impact of the program is stronger among the sub-group of orphans, who make up 54 percent of the sample. Additionally, both orphan and non-orphan males from treatment households had positive and significant impact on their Hope scores. Other studies in SSA have used and validated the Hope Scale on similar populations [23,24], one also found no difference between orphans and non-orphan children Hope Scale scores [25].

This paper extends the literature on the effects of unconditional cash transfer programs and provides empirical support for the hypothesis that poverty alleviation programs can improve mental health outcomes. Another existing study also found positive impacts (which dissipated after program termination) of a small, localized conditional cash transfer program targeting adolescent females in Malawi [29], 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. While the study in Malawi did find positive program impacts on mental health among girls, differences in the details (conditional, small, and targeted to school girls) 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. Moreover, 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, unlike in Africa cash transfers tend to be conditional on school attendance, have found only limited evidence of effects on mental health outcomes. These studies have shown mixed evidence that cash transfer programs can improve maternal mental health [30-32].

The observed pattern of gender differences in prevalence of depression is a widely recognized phenomenon [33,34]. Other studies have shown that women are more likely to be depressed and that this divide is more pronounced during adolescence [35,36]. 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. Additionally, among males, the CT-OVC has a stronger impact among orphans than non-orphans. One reason may be that the positive income shock from the cash transfer has a greater buffering

effect against depression by mitigating the economic losses due to parental loss for orphans over non-orphans [16].

### Limitations

There are several limitations of this study that merit discussion. First, we do not have baseline (pre-program) data on youth so our ability to make causal claims rests 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 and an important correlate of mental health. 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. More orphans in the treatment group could impact baseline depression since the trauma of losing a parent is a big risk factor for children's mental health functioning. AIDS-affected orphans in particular 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.

A third 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 households where a resident child has experienced parental loss. This limits the generalizability of the findings for other interventions not targeted to the OVC population. Nevertheless, our findings are an important contribution 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.

### Conclusion

This study provides novel evidence on the mental health impacts of young persons from a large-scale poverty alleviation program. A number of countries in SSA now implement unconditional cash transfer programs that have similar objectives and features as Kenya's CT-OVC program (e.g. Zambia, Ghana, Zimbabwe and Malawi) [37]. Results reported here show that such poverty-targeted unconditional cash transfer programs can contribute to the improved mental health of young people and can thus serve as an important complement to more targeted interventions whose primary goal is adolescent mental health. Further study of the mental health effects of national poverty targeted cash transfer programs in other countries, the pathways for these effects, and gender differences in these pathways are important priorities for future research.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

## 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 170,000 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**

170,000 households were enrolled as of January 2014. 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.

## Panel 2: Sample Attrition

Attrition in our study 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 1 displays sample characteristics from each wave. Heads of household in the intervention arm are older, more likely to be female, and have less education. Note 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.

## 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 | |

| Baseline Characteristics | Below cutoff | Above Cutoff | p-value |
|---|---|---|---|
| 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 (odds ratios)

| | Full Sample | | | | Young Women | | | | Young men |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 |
| Intervention | 0.75* | 0.77* | 0.76* | 0.94* | 0.98 | 1.09 | 1.07 | 1.02 | 0.65* |
| | [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] |
| 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 | | | |
| | | [0.50,0.85] | | | | [0.45,1.02] | | | |
| Worked | | | 1.19 | | | | 1.18 | | |
| | | | [0.88,1.62] | | | | [0.63,2.19] | | |
| Total hours worked per week | | | | 1 | | | | 1.01 | |
| | | | | [1.00,1.01] | | | | [0.99,1.02] | |
| Age | 1.14** | 1.07* | 1.08** | 1.02** | 1.26** | 1.13** | 1.14** | 1.03** | 1.08 |
| | [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] |
| 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 |
| | [0.62,1.20] | [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] |
| Child | 1.13 | 0.93 | 0.92 | 0.98 | 1.18 | 0.94 | 0.89 | 0.97 | 1.13 |
| | [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] |
| Grandchild | 1.17 | 0.98 | 0.94 | 0.99 | 1.16 | 0.84 | 0.79 | 0.94 | 1.2 |

| | Full Sample | | | | Young Women | | | | Young men |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 |
| | [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] |
| No illness/injury past 4 weeks | 0.77 | 0.78* | 0.80* | 0.95* | 0.73 | 0.78 | 0.81 | 0.95 | 0.77 |
| | [0.59,1.00] | [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] |
| Female head | 1.2 | 0.99 | 0.98 | 1 | 0.81 | 0.68* | 0.68* | 0.92* | 1.52* |
| | [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] |
| Age of head | 1 | 1 | 1 | 1 | 1 | 0.99 | 0.99 | 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] |
| Head has education | 0.84 | 0.86 | 0.82 | 0.96 | 0.79 | 0.85 | 0.78 | 0.95 | 0.85 |
| | [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] |
| Nairobi | 1.12 | 1.51* | 1.43* | 1.10* | 1.02 | 0.86 | 0.81 | 0.97 | 1.18 |
| | [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] |
| N | 1334 | 1960 | 1960 | 1947 | 533 | 773 | 773 | 768 | 801 |
| Chi2 | 33.8 | 47.01 | 37.03 | | 20.19 | 29.68 | 26.73 | | 21.1 |
| p | 0 | 0 | 0 | 0 | 0.04 | 0 | 0.01 | 0 | 0.03 |

95% confidence intervals in brackets;

*** p<0.001,

** p<0.01,

* p<0.05.

Within each major category, the mediators are as follows: Column 1: School enrollment; Column 2: completed Standard 8; Column 3: whether engaged in paid work; Column 4: hours worked per week.

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## Acronyms

**CT-OVC**

**CES-D**

**OVC**

**SSA**

**GoK**

**SCT**

**SES**

## Implications and Contribution Statement

Kenya's Cash Transfer for Orphans and Vulnerable Children program contributes to the protection of young people's psychosocial health, with largest effects on young men and orphans. Results suggest that poverty-targeted unconditional cash transfers programs could help reduce the burden of mental health among young people in Sub-Saharan Africa.

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**Table 1**

**Household characteristics by data collection period and intervention status**

| Sample: | 2007 | | 2009 | | 2011 | |
|---|---|---|---|---|---|---|
| | **I** | **C** | **I** | **C** | **I** | **C** |
| **Demographics** | | | | | | |
| Household size (mean) | 5.48 | 5.79 | 5.54 | 5.81 | 5.53 | 5.82 |
| Female head (proportion) | 0.65 | **0.57** | 0.65 | **0.59** | 0.65 | **0.59** |
| Age of head in years (mean) | 62.34 | **56.06** | 62.21 | **56.20** | 62.55 | **56.55** |
| Head not completed primary (proportion) | 0.53 | **0.38** | 0.53 | **0.38** | 0.53 | **0.38** |
| **Poverty** | | | | | | |
| Per adult equiv. monthly consumption (mean KS) | 1533 | 1501 | 1542 | 1460 | 1550 | 1442 |
| Walls of mud/dung/grass/sticks(proportion) | 0.75 | 0.84 | 0.75 | 0.86 | 0.74 | 0.87 |
| Roof of mud/dung/grass/sticks(proportion) | 0.23 | 0.22 | 0.23 | 0.23 | 0.22 | 0.22 |
| Floor of mud/dung(proportion) | 0.66 | 0.74 | 0.65 | 0.77 | 0.66 | 0.79 |
| No toilet(proportion) | 0.55 | 0.56 | 0.55 | 0.56 | 0.54 | 0.56 |
| Unprotected water source (proportion) | 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.

**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 | 012 |
| Male | 0.620 | 0.60 | 0.61 | 0.80 |
| Orphan | 0.54 | 0.56 | 0.49 | 001 |
| Child of Head | 0.49 | 0.55 | 0.47 | 000 |
| Grandchild of head | 0.30 | 0.34 | 0.20 | 000 |
| Female head | 0.62 | 0.63 | 0.60 | 018 |
| Age of Head in years | 60.4 | 620 | 56.9 | 000 |
| Head any education | 0.54 | 0.53 | 0.58 | 002 |
| Nairobi residence | 012 | 014 | 0.07 | 000 |
| **Outcomes** |  |  |  |  |
| CES-D 10 | 0.334 | 0.32 | 0.37 | 002 |
| CES-D 10 women (N=689) | 0.34 | 0.34 | 0.33 | 0.82 |
| CES-D 10 men (N=1 129) | 0.34 | 0.31 | 0.40 | 000 |
| HOPE | 0.54 | 0.56 | 0.5 | 002 |
| No illness/injury past 4 weeks | 0.73 | 0.72 | 0.74 | 0.27 |
| Healthier than year ago | 0.50 | 0.49 | 0.43 | 002 |
| 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.

**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 |

| | Full sample | | Males | | Females | |
|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
| 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**

**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

**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

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