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**Orphanhood and Self-esteem:
an 18-year longitudinal study from an HIV affected area in Tanzania¹**

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Background: The HIV epidemic exacerbated the prevalence of prime-aged adult death in many parts of sub-Saharan Africa, resulting in increased rates of orphanhood. Little is known about whether this will coincide with adverse psychosocial wellbeing in adulthood for those who were orphaned at childhood.

Methods: We studied a cohort of 1,108 children from Kagera, a region of Tanzania that was heavily affected by HIV early in the epidemic. During the baseline data collection in 1991-94 these children were aged 0-16 years and had both parents alive. We followed them roughly 16-19 years later in 2010, by which time 531 children (36%) had lost either one or both parents before their 19th birthday. We compared the 2010 10-item Rosenberg Self-Esteem Scale (RSES) score between children who lost a parent before the age of 19 and those who did not. We used the baseline data to control for pre-orphanhood confounders. This is important, since we find that children who will lose their fathers in the future before age 19 came from somewhat lower socioeconomic backgrounds.

Results: We found no correlation between maternal death and self-esteem measured through RSES. Paternal death was strongly correlated to lower levels of self-esteem (0.2 standard deviations lower RSES CI95% 0.059-0.348) and the correlation was stronger when the death occurred during the child's teenage years. These effects are net of socioeconomic differences that existed before the orphanhood event.

Conclusions: Our study supports the further development and piloting of programmes that address psychosocial problems of orphans.

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INTRODUCTION

The Global Burden of Disease Study 2015 estimated that there were 1.2m HIV/AIDS deaths worldwide (CI 95% 1.1m, 1.3m), out of which 859,000 (CI 95% 804,610, 912,930) were in Sub-Saharan Africa.¹ There are a range of studies about the impact of orphanhood in sub-Saharan Africa, particularly in countries where orphanhood increased sharply in the 1990s due to the AIDS epidemic²⁻⁹. These studies have mostly focused on schooling and sometimes health outcomes. Over time, they have evolved from use of cross-sectional survey data, to more sophisticated analysis with longitudinal data. This has facilitated interpreting results as informing on the causal impact of orphanhood. Generalizing these findings, the impacts that are found are mostly associated with the loss of a child's mother, rather than paternal deaths.

Another strand of the literature on orphanhood in Sub-Saharan Africa focuses on psychosocial consequences. The first case-control study investigating this came from Tanzania, where 41 orphans were compared with 41 matched non-orphans from the same neighborhoods^{10,11}. The study highlighted how orphans were not just socioeconomically disadvantaged, but also had elevated levels of internalizing problems, potentially jeopardizing their long-run mental health.

Similar evidence from other countries soon followed and over the past 15 years evidence has accumulated from many countries in the region, such as South Africa¹²⁻¹⁴, Uganda^{15,16}, Ethiopia¹⁷, Zimbabwe¹⁸, Namibia¹⁹ and Rwanda²⁰. By and large these studies found negative associations between orphanhood and psychosocial outcomes, although some studies stressed that circumstances surrounding the orphanhood experience are at least as important as orphanhood itself. This point is echoed in a recent systematic review focusing on the relation between AIDS-related orphanhood and child mental health²¹.

Much of the work is cross-sectional in nature and compares between orphans and non-orphans. Two recent studies were able to harness the power of panel data to take the analysis a step further. One study from South Africa followed orphans and non-orphans over 4 years and found that the mental health outcomes of orphans worsened over this period²². A study from Ethiopia, by contrast, found that the negative short term effects of pre-teenage maternal death disappeared by the age of 14-15²³.

These longitudinal data sets have sharpened insights into the long-run impact of parental death on psychosocial outcomes. However, neither had a sample of non-orphaned children who could then be compared in adulthood to those who had suffered parental loss. This would address concern about pre-orphanhood confounders. To the best of our knowledge, our study is the first to be able to use that kind of set-up.

We analyzed a sample of 1,108 children interviewed at baseline in 1991-94 in the Kagera region of Tanzania as part of the Kagera Health and Development Survey (KHDS). This region was heavily affected by HIV early on in the epidemic. The baseline included non-orphaned children and by the endline, about 18 years later in 2010, 15% had lost their mother before the age of 19 and double that number had lost their father.

This study focused on self-esteem as the main outcome of interest. During the 2010 follow-up round we measured respondent's global self-esteem, which can be described as his or her overall sense of self-worthiness, self-acceptance, and self-respect²⁴⁻²⁵. A recent systematic review of the empirical research on the mental health effects of orphanhood by AIDS-related causes categorized studies by

outcomes and showed a concentration of studies looking at depression, anxiety, and conduct problems²¹. Of all the studies cited above in this introduction only one looked at self-esteem²³. Self-esteem is of interest as a measure of psychosocial wellbeing; it has been shown that those with positive self-esteem earn more and are more satisfied with life²⁶⁻²⁹. Global self-esteem is related to two domains of the Big Five personality traits, neuroticism and extraversion. The 10-item Rosenberg Self-Esteem Scale (RSES)³⁰⁻³² is a widely used measure of global self-esteem.²

A study that translated the items into 28 languages and administered it to 16,998 participants across 53 nations found that the internal reliability and factor structure of the Rosenberg-scale was psychometrically sound across many languages and cultures, although there is a tendency for people from collectivist cultures to avoid extreme ends of the scale as well as some cross-cultural variability in responses to negatively formulated items.³³ Thus, while self-esteem is only one aspect of a constellation of psychosocial wellbeing measures that may be affected by parental death – and indeed low self-esteem may coincide with other adverse personality traits – its importance for earnings and life satisfaction on the one hand and the pleasing psychometric properties of RSES on the other, make it an important and feasible trait to study.

Our research strategy was to compare the 2010 RSES of people who became orphaned before the age of 19 to those who did not. Our study sample was people originally interviewed for the first time between 1991-1994 when young (between 0-16 years) and not orphaned, who were re-interviewed in 2010 as young adults (15-30 years old). Given the period of study and age of respondents, we captured impacts of orphanhood in childhood on self-esteem in young adults. We further disaggregated results by whether the child was orphaned in pre-teenage or teenage years. In a second step, we controlled for a variety of background characteristics.

DATA AND METHODS

The KHDS is a publically available data set.³⁴ The 2010 round of the KHDS attempted to re-interview 6,353 individuals first interviewed in 1991-94 and representative for the Kagera Region at that time. In 2010, all respondents between the ages of 15 and 30 years were eligible to be administered the 10-item Rosenberg Self-Esteem Scale (described below). If there were two or more household members ages 15-30, then the survey software on handheld devices randomly selected one eligible person per household to be administered the self-esteem questions.

We studied people originally interviewed for the first time between 1991-1994 when young (between 0-16 years) and not orphaned, who were re-interviewed in 2010 as young adults (15-30 years old). There are 1,839 young persons who were not orphaned in the first interview. The 2010 interview teams traced and interviewed 1,430 (78%) that are used for the analysis. Of the remaining, 233 (13%) were not found, 151 (8%) had died, and 13 (0.7%) refused to be interviewed. For 12 (0.7%) we could not determine their orphanhood status.

It is a mobile population. Whereas 94% of these individuals originated from rural villages, by 2010 they were found residing, on average, 158 km from their 1991-1994 locations with 65% still found in villages, but 25% in towns and 10% in cities.

² Among the alternatives are the Tennessee Self-concept Scale^{50,51} and the Beck Youth Inventories⁴⁸.

Table 1 shows that out of the 1,430 children, non-orphaned at baseline and successfully interviewed in 2010, 15% had lost their mother, 30% their father and 9% both parents before the age of 19 by 2010. The higher rates of paternal orphanhood are typical for the region and exist despite a slightly higher prevalence of HIV among women in Tanzania -- 6.2% among women aged 15-49 compared to 3.8% among similarly aged men.³⁶ This pattern has been attributed to gender patterns in age-specific mortality and the age gap between husbands and wives.³⁵ Table 1 further breaks these numbers down by whether the parent died during the child's pre-teenage (0-12 years old) or teenage years (13-19 years old). The data do not allow us to ascertain the cause of death.

Out of the 1,430 successfully interviewed individuals 322 were excluded from analysis because they were not randomly selected to be administered the self-esteem module, giving a final analytical sample of 1,108 people. Table 1 shows that orphanhood rates within this sample were near-identical to those in the full sample.

The 10-item self-esteem questionnaire was a Swahili translation of the original Rosenberg³⁰ questionnaire. We ensured the Swahili wording accurately reflected the original meaning in English through a process of translation and back translation. We first inverted the 4-point Likert response codes of the negatively formulated items. We then standardized each item by subtracting the mean and dividing by the standard deviation. Finally, we constructed the RSES as the average of the standardized items. RSES values range from -1.31 to 1.09, with an average of 0.02 and a standard deviation of 0.38. For the analysis, we divided the RSES by its standard deviation so that we can assess differences in self-esteem in terms of standard deviations of RSES, which is more meaningful.

Table 2 shows that in terms of age, gender, weight, and height at baseline the (future) maternal and paternal orphans in our sample were similar to those who do not lose a parent. However, paternal orphans came from households where the head was older and had lower education outcomes. At baseline their households consumed about 1.5% less than others and they were 5.7 percentage points less likely to have been living in a house with good flooring.

Maternal orphans had a different pre-orphanhood profile. The household in which they resided were consuming about 9% more per capita and were 6.4 percentage points more likely to have a cement floor. Furthermore, maternal orphans had higher educated mothers and fathers.

Clearly orphans came from somewhat different socioeconomic backgrounds compared to non-orphans and these differences vary by the gender of the deceased parent. This is not surprising given the non-random distribution of HIV prevalence across gender and socioeconomic status in Tanzania and highlights the importance of taking into account potential confounders when comparing orphans to non-orphans.^{36,37}

We started our analysis by regressing (standard deviations of) RSES on dummies indicating whether the individual suffered paternal death or maternal death. These were two indicator variables when we considered any death at 0-19 years of age and four indicator variables when we divide parental death depending on whether it occurred during pre-teenage (0-12) or teenage (13-19) years. In a second regression model we did the same, but tightened the comparison by adding dummies for the origin village, gender, and age. In a final model we further added the remaining pre-orphanhood characteristics from Table 2. This last regression is our preferred specification. These pre-orphanhood characteristics are included as controls in order to compare like for like in this

observational setting. That is, we want to compare two children from similar households, where one of the children later becomes orphaned. These are not static traits. We measured these also in 2010 but we did not include the 2010 values in the regressions since these measures may be affected by the orphanhood experience (if, for example, lower self-esteem affects labor productivity and household income).

We also explored the interaction of parental death with (i) gender of the respondent, (ii) the time that has passed since the death, (iii) the death of the other parent (double orphanhood) and (iv) three contemporaneous variables measuring years of schooling, body stature and wealth.

RESULTS

Figure 1 shows the results from the three models described above (no controls, minimal controls, full controls) for maternal and paternal deaths. The point estimates and confidence intervals are presented in Appendix Table A2. The average self-esteem score in adulthood did not differ in any statistically significant manner by maternal orphanhood, regardless of specification. By contrast paternal orphans' RSES was on average about 0.204 (CI95% 0.059,0.348) standard deviations lower for those orphaned between the ages of 0-19 across the three alternate specifications. The fact that additional controls did not change the result suggests that cross-sectional data would produce the same findings as longitudinal surveys.

We introduced the age-dimension to when a parent passes in Figure 2 and Table A3, by looking at parental deaths when the young person was 0-12 years and when 13-19 years. Again, maternal deaths were not found to impact self-esteem. Paternal orphanhood in pre-teenage years is associated with a decline in RSES and the magnitude is consistent across specifications. Referring to the third specification, children who suffer pre-teen (0-12 years) paternal loss scored 0.172 (CI95% - 0.007, 0.350) standard deviations lower on RSES, while those who lost their father during teenage years score 0.236 (CI95% 0.039, 0.434) standard deviations lower. These findings mirror the direction of results on the same sample for a measure of locus of control (the extent to which someone believes what happens in life is beyond or in one's control), an adaptation of the Rotter internality/externality scale.³⁸ These results are not presented here.

We interacted the orphan dummies with each other, with a gender dummy, and with the years between the interview and the parental death. The results, presented in Table A4, show no gender differentiated effects (column 1), no multiplicative effects of double orphanhood (column 2) and no evidence that the effects depended on the time since bereavement (column 3).

In a further specification (table A4 column 4), we controlled for two contemporaneous human capital outcomes (the number of formal years of schooling and the attained height of the child in 2010) and one contemporaneous wealth indicator (household expenditures per capita in 2010). Including these separately or jointly did not change the coefficients on the orphanhood variables which indicates that the correlation between paternal orphanhood and adverse self-esteem outcomes holds across young adults of a variety of education, health, and wealth outcomes.

DISCUSSION

The last Tanzania HIV/AIDS and Malaria Indicator Survey 2011-12 put HIV/AIDS prevalence among the 15-49 year old population at 6.2% and showed that orphanhood is widespread in Tanzania.³⁶ One out of every eleven children (9%) under the age of 18 has lost either one or both parents and one out of every seven Tanzanian households (15%) hosts an orphan.

Our data come from the Kagera Region in the north-western part of the country, bordering Uganda. The first three Tanzanian AIDS cases were detected in this region.³⁹ Because Kagera has a much longer history of HIV/AIDS than most other areas, it now provides a unique window into intergenerational impacts, with the children of the victims of the early peak of the disease now transitioned into adulthood. Furthermore, the high HIV prevalence in the region prompted a number of data collection activities, which now provide the necessary baseline data to control for pre-orphanhood baseline confounders. Around the time of the baseline the Kagera region had elevated prevalence rates of HIV, which were slowly decreasing. In 1990 22.4% (CI95% 20.6, 25.2) of women going for antenatal care in the region's main hospital in Bukoba tested positive for HIV.⁴⁰ The results should then be interpreted as informing on the plight of orphans in a highly HIV-affected area.

Orphans could suffer from lower self-esteem through a variety of pathways¹⁰ and some studies suggest that AIDS-orphans may suffer more severely from social stigma^{22,41,42}. But empirical research has shown that stigmatized individuals actively protect their self-esteem, such that there is no simple one-to-one inverse relation between social stigma and low self-esteem.⁴³ This highlights the need to study these effects in the long-run in order to assess their persistence.

The debate on orphanhood is often focused on maternal orphans, perhaps in part motivated by previous findings of the importance of maternal status with regard to child schooling and nutrition. Still, there are many good reasons to examine the role of the father. For example, a nascent literature in economics shows how father presence plays a key role in the intergenerational transmission of education and earnings in high-income countries.⁴⁴⁻⁴⁶ A much earlier example, was a line of research on black identity in the US, initiated in the wake of the 1965 Moynihan Report, which was concerned with the possible contribution of elevated father-absence in the black community to poor self-esteem.⁴⁷

Our study points to the importance of paternal death, whether HIV-related or not, for long-run self-esteem of older children. This complements other work that has highlighted the adverse effects of maternal death on children of younger ages, but mostly narrowly focuses on schooling.²⁻⁹ Thus, our work broadens the range of outcomes measuring well-being and highlights the role of the father for psycho-social outcomes, with teenage paternal orphans suffering lower self-esteem.

The strength of our study comes the fact that we could observe children prior to orphanhood, which allows us to control for pre-orphanhood characteristics. The long, 18-year time frame gives us some confidence that these are long term and persistent effects. The two most important limitations of our study are, first, that it is focused on just one region in Africa and it remains unclear whether the results can be generalized outside this context. Second, our study is focused only on self-esteem, while there may be a host of other outcomes that are relevant.

Our study builds the case for further development and evaluation of psychosocial support programs for children who lose their parents. Evaluations have been conducted of a peer-group support program for AIDS-orphans in Uganda⁴⁸ and a South-African project that runs art and education activities to boost self-esteem, self-efficacy and HIV-insight for children affected by HIV⁴⁹. Both these programs were found to have positive effects on some psychosocial outcomes, but not on self-esteem. We do find positive effects on self-esteem documented in two evaluations of economic empowerment projects for orphans in Uganda^{50,51}.

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Table 1: Orphanhood rates

	Full Sample		Analytical Sample	
	N	%	N	%
Mother died when child was age 0-19	218	15.24	176	15.88
Mother died when child was age 0-12	128	8.95	101	9.12
Mother died when child was age 13-19	90	6.29	75	6.77
Father died when child was age 0-19	425	29.72	334	30.14
Father died when child was age 0-12	255	17.83	197	17.78
Father died when child was age 13-19	170	11.89	137	12.36
Both died when child was age 0-19	126	8.81	97	8.75
Both died when child was age 0-12	73	5.10	56	5.05
Both died by child age 13-19	53	3.71	41	3.70
TOTAL	1,430	100	1,108	100

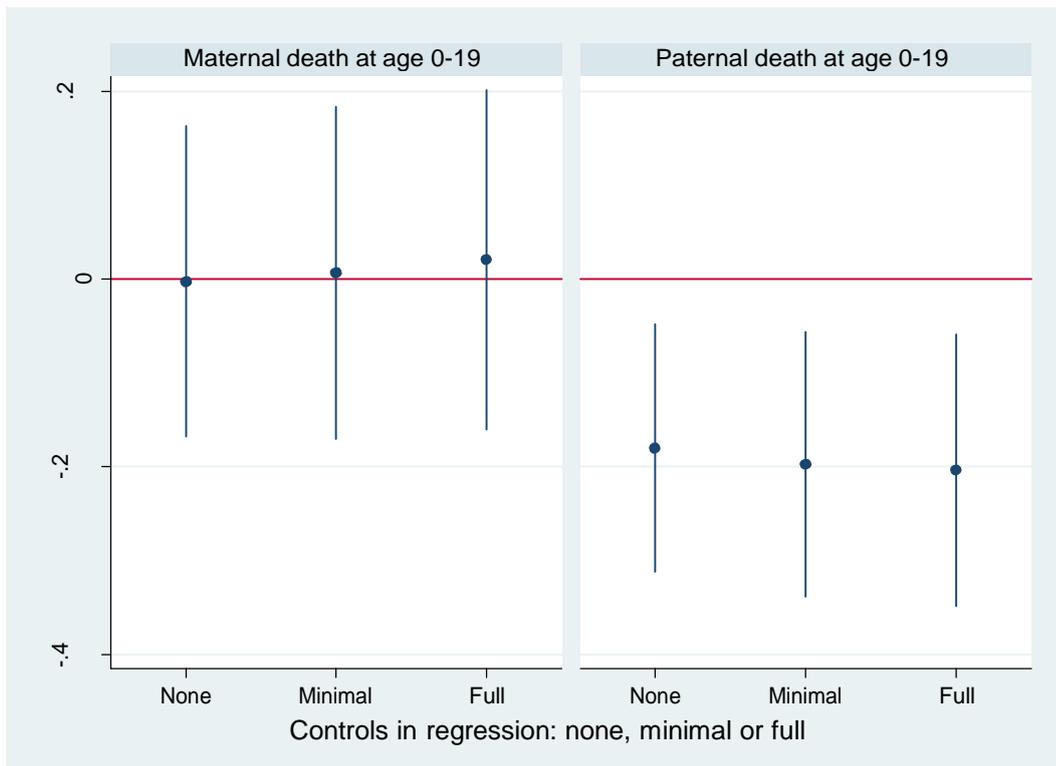
Notes: The full sample comprises people who were 0-16 years old, non-orphaned at baseline, and re-interviewed in 2010. The analytical sample is the subsample who were also randomly selected to be administered the self-esteem module in 2010.

Table 2: Baseline traits of (future) orphans and non-orphans

Pre-orphanhood traits (from baseline, 1991-94)	Sample Mean	Difference maternal orphan vs mother alive till age 19	p-value of dif. (two-sided)	Difference paternal orphan vs. father alive till age 19	p-value of dif. (two-sided)
Age in years	5.120	0.276	0.389	-0.330	0.195
Proportion male	0.464	0.056	0.169	0.039	0.235
Height in cm	100.324	2.477	0.252	-2.557	0.138
Weight in kg	16.613	0.849	0.214	-0.771	0.157
Years education of household head	4.542	-0.022	0.929	-0.775	0.000
Proportion female headed	0.150	0.079	0.007	0.077	0.001
Household head age in years	47.897	0.911	0.460	4.713	0.000
Log per capita consumption	11.821	0.090	0.054	-0.015	0.695
Good floor	0.162	0.064	0.036	-0.057	0.019
Mother resides in household	0.791	-0.096	0.004	-0.056	0.036
Mother's years of education	4.316	0.696	0.005	-0.183	0.352
Mother's height in cm	157.651	0.850	0.124	-0.065	0.880
Father resides in household	0.690	-0.171	0.000	-0.044	0.145
Father's years of education	5.408	0.645	0.009	-0.447	0.023

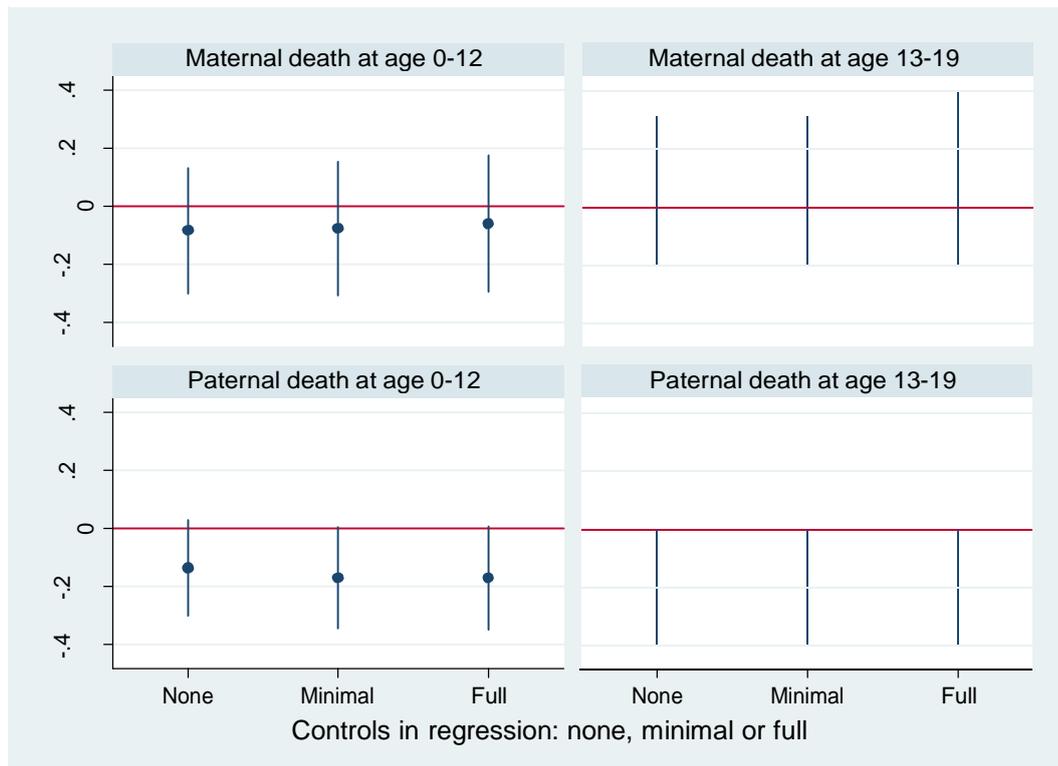
Notes: N=1,108, except for height in cm (2 missing observations), log per capita consumption (41 missing observations), mother's years of education (7 missing observations), father's years of education (12 missing observations), and mother's height (218 missing observations). [Table A1](#) presents standard deviations, minimum values and maximum values for the continuous variables of this table.

Figure 1: The effect of parental death on child self-esteem



Notes: Results from three different regressions models. Each regresses the Rosenberg Self-Esteem Score (RSES) on two dummies indicating whether the individual has experienced, respectively, maternal or paternal death before the age of 19 years. The first regression model has no controls; the second model adds in dummies for the individual's sex, home village and years of age; the third model further controls for all the pre-orphanhood characteristics of Table 2 (in addition to the dummies from the second model). The results present point estimates and 95% confidence intervals of the coefficients of on the maternal and paternal death dummies. They represent the difference in standard deviations of RSES associated with parental death.

Figure 2: The effect of parental death on child self-esteem, by age



Notes: Results from three different regressions models. Each regresses the Rosenberg Self-Esteem Score (RSES) on four dummies indicating whether the individual has experienced, respectively, maternal death at age 0-12 years, maternal death at 13-19 years, paternal death at 0-12 years or paternal death at 13-19 years. The first regression model has no controls; the second model adds in dummies for the individual’s sex, home village and years of age; the third model further controls for all the pre-orphanhood characteristics of Table 2 (in addition to the dummies from the second model). The results present point estimates and 95% confidence intervals of the coefficients of on the maternal and paternal death dummies. They represent the difference in standard deviations of RSES associated with parental death.

ON-LINE APPENDIX:

1. Standard deviations, minima and maxima of continuous variables (Table A1)
2. Point estimates and CIs for figure 1 and 2 (Table A2 & A3)
3. Interaction effects (Table A4)

Table A1: Standard deviations, minimum values and maximum values

Pre-orphanhood traits (from baseline, 1991-94)	standard deviation	minimum	maximum
Age in years	3.90	0.00	16.00
Height in cm	26.28	42.00	162.50
Weight in kg	8.31	2.20	49.60
Years education of household head	3.06	0.00	18.00
Household head age in years	15.01	7.00	95.10
Log per capita consumption	0.56	9.64	13.77
Mother's years of education	2.99	0.00	11.00
Mother's height in cm	5.80	140.80	176.00
Father's years of education	2.99	0.00	19.00

Note: This table provides further information on the standard deviations, maximum values and minimum values of the continuous variables used in the analysis. Means for all variables are found in Table 2. For dummy variables all the information is included in the mean, so they are excluded from this table.

Table A2: Point estimates and 95% CIs of Figure 1

	(1) SDs of RSES	(2) SDs of RSES	(3) SDs of RSES
Maternal death at age 0-19	-0.00246 [-0.168,0.163]	0.00667 [-0.170,0.184]	0.0204 [-0.160,0.201]
Paternal death at age 0-19	-0.180*** [-0.312,-0.0480]	-0.197*** [-0.338,-0.0564]	-0.204*** [-0.348,-0.0588]
R ²	0.00685	0.0201	0.0304
F	3.813	1.120	0.889
N	1108	1108	1108

Notes: (1) no controls, (2) minimal controls (3) full controls

* p<0.1, ** p<0.05, *** p<0.01

Table A3: Point estimates and 95% CIs of Figure 2

	(1) SDs of RSES	(2) SDs of RSES	(3) SDs of RSES
Maternal death at age 0-12	-0.0835 [-0.300,0.133]	-0.0769 [-0.308,0.154]	-0.0589 [-0.293,0.176]
Maternal death at age 13-19	0.0761 [-0.160,0.313]	0.0988 [-0.151,0.349]	0.104 [-0.150,0.359]
Paternal death at age 0-12	-0.135 [-0.300,0.0295]	-0.170* [-0.345,0.00427]	-0.172* [-0.350,0.00681]
Paternal death at age 13-19	-0.225** [-0.407,-0.0435]	-0.221** [-0.415,-0.0275]	-0.236** [-0.434,-0.0385]
R ²	0.00819	0.0213	0.0315
F	2.276	1.071	0.872
N	1108	1108	1108

Notes: Regression specifications in column 1 have no controls, in column 2 have minimal controls, and in column 3 have full controls as described in the text.

* p<0.1, ** p<0.05, *** p<0.01

Table A4: Interaction effects

	(1) SDs of RSES	(2) SDs of RSES	(3) SDs of RSES	(4) SDs of RSES
Maternal death at age 0-12	-0.241 (0.165)	0.0767 (0.645)	0.410 (0.389)	-0.0467 (0.697)
Maternal death at age 13-19	-0.0399 (0.822)	0.0939 (0.567)	0.0402 (0.901)	0.147 (0.260)
Paternal death at age 0-12	-0.0642 (0.611)	-0.122 (0.237)	-0.134 (0.709)	-0.166* (0.068)
Paternal death at age 13-19	-0.196 (0.152)	-0.236** (0.026)	-0.448** (0.027)	-0.238** (0.018)
(Maternal death at age 0-12) * (male respondent)	0.342 (0.140)			
(Maternal death at age 13-19) * (male respondent)	0.299 (0.238)			
(Paternal death at age 0-12) * (male respondent)	-0.209 (0.241)			
(Paternal death at age 13-19) * (male respondent)	-0.0871 (0.658)			
Double orphan at age 0-12		-0.285 (0.231)		
Double orphan at age 13-19		0.00954 (0.967)		
(Maternal death at age 0-12) * (years since death)			-0.0322 (0.315)	
(Maternal death at age 13-19) * (years since death)			0.00594 (0.846)	
(Paternal death at age 0-12) * (years since death)			-0.00319 (0.892)	
(Paternal death at age 13-19) * (years since death)			0.0248 (0.242)	
contemporaneous years of education				0.0339*** (0.008)

contemporaneous height (cm) -0.00506
(0.377)

contemporaneous log
consumption per capita (TZS) 0.0618
(0.256)

R ²	0.0350	0.0330	0.0338	0.0438
F	0.877	0.866	0.845	1.079
N	1108	1108	1108	1108

p-values in parentheses

* *p*<0.1, ** *p*<0.05, *** *p*<0.01