



## Evidence-based gender findings for children affected by HIV and AIDS – a systematic overview

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This review (under the International Joint Learning Initiative on Children and AIDS) provides a detailed evidence analysis of gender, children and AIDS. Six systematic reviews provide the most up to date evidence base on research surrounding children and HIV on key topics of treatment resistance and adherence, schooling, nutrition, cognitive development and orphaning and bereavement. Traditional systematic review techniques were used to identify all published studies on four key topics, then studies were selected according to adequacy criteria (sufficient size, control group and adequate measures). A gender analysis was performed on included studies, detailing whether gender was measured, results were analysed by gender or any gender-based findings. For family studies, both the gender of the parents and gender of the child are needed. Secondary analysis by gender was performed on existing systematic reviews for treatment resistance and adherence. Of the 12 studies on treatment resistance, 11 did not look at gender. One found boys at a seven-fold risk compared to girls. For medication adherence, gender was not significant. Of the 15 studies on schooling, 12 analysed findings by gender with an overall female disadvantage. Of the 14 studies on nutrition, nine analysed by gender with mixed findings. Of the 54 studies on cognitive development, 17 provided gender data, but only four analysed by gender with few differences established. Of the 15 studies on bereavement, seven analysed data by gender again with mixed findings. Major policies fail to provide gender data for young children. WHO, UNAIDS and the international data sets are not gathered or coded by gender for young children (generally under 15 years of age) despite well-established gender challenges in later life. This review shows that the current evidence base is inadequate. Data on gender variation and outcome are urgently needed to inform policy and research on children and HIV.

**Keywords:** gender; HIV/AIDS; children; policy

### Background

Gender plays a well-established role in HIV prevention, transmission, vulnerability and response. Comprehensive studies have shown differential vulnerabilities and circumstances which affect males and females. This has covered epidemiology, access to treatment and research inclusion. Yet curiously, gender issues for children are neglected. In the non-HIV/AIDS literature gender is seen as an important factor in a number of developmental arenas, such as education, child development, cognition, socialising and parental interactions. Indeed, mental health, behavioural problems and access to education are all well-documented issues that are affected by gender.

Our society is bisected by gender. Within families, as within societies, gender affects the biological susceptibility to HIV/AIDS as well as the social susceptibility as gender roles, gender differences and gender responses intertwine with daily life. Much has been written about gender discrimination (Bhana, 2007), and how, from an early age, roles and role differentiation may adversely affect children gener-

ally, and girls specifically. Clearly family plays a key role in the construction of gender, gender roles, gender expectations and gender differences (Belden & Squires, 2008). Within this construction, there are a number of aspects of gender-related issues that are highly relevant to the study of HIV/AIDS, programme provision and research questions. In addition to biological gender differences, issues relate to gender differences in provision (within families and within the social network), social and cultural constructs of gender which disadvantage or disempower sub-groups, violence, sexual attitudes, gender selection and preferential treatment in terms of schooling, Alderman, Hodinott, and Kinsey (2006), Liu, Raine, Venables, Dalais, and Mednick, (2003) nutrition, attention and provision, genital mutilation and marriage (Andersson, Cockcroft, & Shea, 2008). There are also gender issues associated with care, caring roles and the imbalance of impact on a young child with disruption of care according to the gender of the child and the caregiver.

Given these important aspects of gender, it is vital that research, policy and programme provision take

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gender into account from the earliest stages. This is done as a matter of course in the adult literature, yet is piecemeal within the children's literature. Ignoring gender may directly affect both boys and girls. Given that, traditionally, greater gender discrimination is reported against girls; their situation should not be overlooked or inaccurately described. However this does not imply that boys are invulnerable. The lack of focus on boys may conversely indicate a greater effort to bring the focus on boys into line with girls. Lack of attention to the situation of boys may have consequences for gender discrimination against girls and women. Not aggregating by gender does both males and females a disservice.

This review explores the issues of gender within key elements of HIV as it affects the lives of children. It provides detailed information in order to summarise gender-based knowledge and present guidance on gender sensitivity and provision in future policies for children.

## Methods

As part of the Joint Learning Initiative on Children and AIDS, a series of systematic reviews were undertaken to study the evidence base. Six systematic reviews reported here provide the most up to date evidence base on research surrounding children and HIV on key topics. The six areas examined in relation to children are:

1. HIV treatment resistance.
2. Adherence to treatment.
3. HIV and schooling.
4. HIV and nutrition.
5. HIV and cognitive development.
6. HIV and bereavement.

Two different methods of analysis were undertaken. For Topics 1 and 2 (HIV treatment resistance and adherence to treatment) clear and recent systematic reviews already existed. For the purpose of this study, all shortlisted papers from these reviews were gathered and recoded according to gender variables. In addition, if any more recently published studies meeting the same criteria were identified, they were added to the body and subjected to the secondary analysis by gender as described below.

For the remaining four topics (schooling, nutrition, cognitive development and bereavement), original systematic literature reviews were undertaken. Research evidence was gathered by detailed study of peer-reviewed published studies. We gathered articles using electronic database searches covering Embase, Medline and Psycinfo until 2006. For all searches

the terms "HIV", "AIDS" and "Children" were used and specialised searches then included terms such as "Orphan", "School", "Education", "Bereavement", "Nutrition" and "Development". A search for allied studies was conducted by following up cross-referred articles. Identified articles were reviewed and hand sorted to include all reports that reached adequacy criteria. These criteria included sufficient sample size, presence of a control group and adequate outcome measures.

For each of the six topics, the finalised list of included studies was then subjected to a gender analysis. This second level review coded on the presence or absence of reported data on gender distribution (both for the child sample and the parent data where appropriate). Studies were then scrutinised to explore whether the results firstly reported on gender, secondly were analysed by gender and finally provide a review of gender-based findings.

## Results

### *HIV treatment resistance*

A systematic review (Arrivé et al., 2007) looked at all studies that examined Neviripine (NVP) resistance in mothers and children. They identified 33 reports where "offspring" received NVP, of which 24 were excluded on methodological grounds. The 11 that were entered into a meta-analysis (covering 339 children) revealed that half the children who became infected despite NVP treatment developed resistance. No data on gender of the child were given. A relevant study on treatment resistance was subsequently identified in the literature. Only this study provided gender related data, and revealed that boys were at a seven-fold risk of developing resistance to treatment. In this research, resistance was defined as triple resistance (resistance to three classes of drugs) (Delaugerre et al., 2007)

### *Adherence to treatment*

The most comprehensive review – carried out by Simoni et al. (2007) – reported that gender was not a significant factor in treatment adherence. Few studies appeared to analyse gender.

### *HIV and schooling*

Fifteen studies meeting inclusion criteria were identified comparing the impact of HIV infection on schooling (Ainsworth, Beegle, & Koda, 2005; Akresh, 2004; Bennell, 2005; Bhargava, 2005; Bicego, Rutstein, & Johnson, 2003; Case & Ardington, 2005; Case, Paxson, & Ableidinger, 2004; Chatterji et al.,

2005; Evans & Miguel, 2007; Kamali et al., 1996; Mishra et al., 2005; Monasch & Boerma, 2004; Nyamukapa & Gregson, 2005; Sharma, 2006; Yamano & Jayne, 2005).

Of these, 12 analysed findings by gender (see Table 1), with an overall female disadvantage.

### ***HIV and nutrition***

Fourteen studies were identified comparing the effect of HIV infection on nutrition between HIV affected and control children (Bhargava, 2005; Bridge, Kipp, Jhangri, Laing, & Konde-Lule, 2006; Chatterji et al., 2005; Crampin et al., 2003; Kamali et al., 1996; Lindblade, Odhiambo, Rosen, & DeCock, 2003; Mamas et al., 2004a,b; Mishra et al., 2005; Panpanich, Brabin, Gonani, & Graham 1999; Rivers, Silvestre, & Mason, 2004; Ryder, Kamenga, Nkusu, Batter, & Heyward, 1994; Sarker, Neckermann, & Muller 2005; Watts et al., 2007).

Of these, nine reported and analysed the findings by gender (see Table 2). The findings were mixed with some identifying a gender disadvantage, while others failed to establish a gender difference.

### ***HIV and cognitive development***

In total, 54 studies on the effect of HIV on cognitive development were identified (Sherr, Mueller, Varrall, & JLICA Working Group 1, 2008, in press). Of these 17 provided data on gender of participants, only four proceeded to analyse their findings according to gender: few differences were identified.

### ***HIV and bereavement***

Despite the fact that many millions of children have lost parents to HIV, we could only identify 15 controlled studies on the issue of HIV and bereavement (Atwine, Cantor-Graae, & Bajunirwe, 2005; Bhargava, 2005; Cluver & Gardner, 2006; Dowdney et al., 1999; Forehand et al., 1999; Grantham-McGregor, Walker, & Chang, 2000; Gregson et al., 2005; Lee, Detels, Rotherham-Borus, & Duan, 2007; Lester et al., 2006; Makame, Ani, & Grantham-McGregor, 2002; Operario, Pettifor, Cluver, MacPhail, & Rees, 2007; Rotherham-Borus, Stein, & Lester, 2006; Rotherham-Borus, Weiss, Alber, & Lester, 2005; Sengendo & Nambi, 1997; Tremblay & Israel, 1998; Wolchik, Tein, Sandler, & Ayers, 2006; Wood, Chase, & Aggleton, 2006).

It is important to note both the gender of the children as well as the gender of the deceased parent to understand the complexities of gender effects. Of these studies, four reported on the gender of parent and child, one provided no gender data and 12

described gender of the child. Seven of the studies proceeded to analyse the data by gender. Mixed gender differences were noted with patterns and clusters of response (see Table 3). There was no systematic difference pointing to overall gender differences.

### **Discussion**

Few studies report specifically on gender within the literature on HIV and child outcomes. Despite the wealth of literature on HIV treatment and children, and existence of clear systematic reviews of this evidence, gender is rarely even mentioned. When gender is recorded, a distinction between biological gender issues and pre-existing social factors is not explicit. Furthermore, if gender is recorded, it does not necessarily follow that results are analysed according to gender.

Gender of the child was not reported as a significant factor in outcome for medication adherence in a systematic review of adherence in children. Adherence is vital for efficacy in children (Simoni et al., 2007), yet the majority of studies are not conducted in resource-poor settings where the majority of HIV infected children reside. Studies are confounded by their coverage of a wide age range of children. These issues may have skewed the current picture. In terms of resistance to treatment, our analysis find that the only study to report on gender shows that males are reported at seven times greater risk than females. This dramatic finding was identified in the *only* study that carried out gender-based analysis (Delaugerre et al., 2007). In addition to this outcome of male vulnerability being particularly important given the traditional focus on female disadvantage, the finding vividly highlights the gender gap in the evidence base and would suggest an urgent need to examine resistance data by gender.

Similarly, gender disparities are noted in other areas of the child HIV treatment literature. Sex differences have been noted in disease progression in children (ECS, 2002, 2003). Two studies have demonstrated that girls were at elevated risk of infection in mother to child transmission (Gabiano et al., 1992; Temmerman et al., 1995). Thorne and Newell (2004) studied 3231 mother child pairs (1684 boys (52%) and 1547 girls (47.9%)). Of these, 10.6% (350 children – 48.6% boys and 51.4% girls) were infected. Associations between gender and mother to child transmission in multivariable regression (allowing for antiretroviral treatment, cesarean section and maternal CD4 cell count) girls were 1.5 times at greater risk of HIV infection relative to boys. When the data were examined according to mode of

Table 1. Gender findings on systematic review of impact of HIV on schooling.

Study	Country	Sample	Control group	Gender description Yes/No Child/Parent	Analysed by gender effects		Child gender findings	Death of parent gender findings	Child and parent gender interaction
					Yes/No Child/Parent	Y Child Parent			
Ainsworth, Beegle, and Koda (2005)	Tanzania	Kagera health and development survey – longitudinal survey from 1991 to 1994. About 757 house- holds completed all rounds. Sixty-two primary schools	Non-orphans	Y Child Parent	Y Child Parent	Female negative effect on hours of attendance	Maternal death Negative effect on enrolment and attendance	Female maternal, female double orphans Negative effect on hours of attendance	
Akresh (2004)	Burkina Faso	Survey of 606 household heads and their 812 wives. About 300 paired households that had exchanged a foster child between 1998 and 2000	Siblings	N	N	–	–	–	
Bennell (2005)	Uganda, Malawi, Botswana	Review and analysis of empirical studies, DHS surveys	Non-orphans	See below	Y Parent	–	Maternal death Negative effect on repeating grade and dropping out Double parental death Negative effect on dropping out, positive effect on attendance	–	
	Botswana				Y Parent	–			

Table 1 (Continued)

Study	Country	Sample	Control group	Gender description		Analysed by gender effects		Child gender findings	Death of parent gender findings	Child and parent gender interaction
				Yes/No Child/Parent	Yes/No Child/Parent	Yes/No Child/Parent	Yes/No Child/Parent			
	Uganda			Y Parent	Y Parent	Y Parent	–	Maternal death Negative effect on dropping out	–	
	Malawi			Y Child Parent	Y Child Parent	Y Child Parent	None independent of parental gender	Paternal death Negative effect on repeating grade. Double death negative effect on dropping out positive effect on attendance	–	<i>Female paternal orphans</i> , male double orphans Negative effect on dropping out Female paternal/double negative effect on attendance
Bhargava (2005)	Ethiopia	The National Survey of Prevalence and Characteristics of Orphans in Ethiopia (2001–2002). (MMPI), ~1000 orphans completed inventory	Non-AIDS orphans	Y Child Maternal death	Y Child	Y Child	<i>Female</i> Negative effect on participation	–	–	–
Bicego, Rutstein, and Johnson (2003)	Zimbabwe Kenya, Tanzania, Ghana, Niger	DHS surveys 1995–2000	Non-orphans	Y Parent	Y Parent	Y Parent	–	Maternal and double parent death Negative effect on correct grade level	–	–

Table 1 (Continued)

Study	Country	Sample	Control group	Gender description Yes/No Child/Parent	Analysed by gender effects		Death of parent gender findings	Child and parent gender interaction
					Yes/No Child/Parent	Child gender findings		
Case and Ardington (2005)	South Africa	Longitudinal data from a demographic surveillance area office. HSE surveys. ~20,000 children	Non-orphan	Y Child Parent	Y Child Parent	No gender difference on any measure of schooling	Maternal and double parent death Negative effect on enrolment, years completed money spent on education	No interaction
Case, Paxson, and Ableidinger (2004)	Ten sub- Saharan Africa	Nineteen DHS stu- dies (Ghana, Kenya, Malawi, Mozambi- que, Namibia, Niger, Tanzania, Uganda, Zambia, Zimbabwe)	Non-orphan	Y Child Parent	Y Child Parent	No gender difference on any measure of schooling	No gender difference Negative effect on enrolment for all orphans	No interaction
Chatterji, et al. (2005)	Rwanda Zambia	Zambia: 496 pri- mary caregivers, 504 children, 563 ado- lescents Rwanda: 570 primary caregivers 656 children, 402 adolescents	Y	Y Child Parent	N	-	-	-
Evans and Miguel (2007)	Kenya	About 7815 children with completed questionnaire data and parental mor- tality data	Y Non-orphan	Y Child Parent	Y Child Parent	No gender difference	Maternal death Negative effect on participation	No interaction
Kamali et al. (1996)	Uganda	Rural population cohort 10,000 peo- ple 52% under 15 yrs. Demographic, socio-economic, ser- ological surveys	Y Non-orphan	Y Parent	N	-	-	-



Table 1 (Continued)

Study	Country	Sample	Control group	Gender description		Analysed by gender effects	Death of parent gender findings	Child and parent gender interaction
				Yes/No	Child/Parent			
Mishra et al. (2005)	Kenya	The 2003 KDHS. About 9865 households. Population-based nationally-representative surveys link individual HIV test results	Y HIV+ parents HIV- parents	Y Child Parent	Y Child Parent	Y Child Parent	Maternal death, paternal death Negative effect on attendance Double positive effect on attendance vs. single orphans	Not detailed
Monasch and Boerma (2004)	Forty sub-Saharan Africa	Twenty-three MICS surveys Fourteen DHS surveys	Y Non-orphans	Y Child Parent	Y Child Parent	Y Child Parent	Double parental death Negative effect on attendance Maternal death Negative effect on completion rate	No interaction No difference maternal or paternal orphans, boys or girls Female paternal orphans Positive effect on completion compared with non-orphans
Nyamukapa and Gregson (2005)	Zimbabwe	First round data from Manicaland study. About 8399 households About 2402 children of primary school completion age.	Y Non-orphans	Y Child Parent	Y Child Parent	Y Child Parent	Maternal death Negative effect on completion rate Paternal death Positive effect on completion rate	No interaction No difference maternal or paternal orphans, boys or girls Female paternal orphans Positive effect on completion compared with non-orphans
Sharma (2006)	Malawi	Longitudinal. Five rounds between 2000 and 2004. Five hundred and thirty-four rural households	Y Non-orphans	Y Child Parent	Y Child Parent	Y Child Parent	No gender difference Negative effect on dropping out for all orphans	No interaction No interaction
Yamano and Jayne (2005)	Kenya	Three-year panel of rural household surveys. About 1266 households included in all three surveys.	Y Children No adult mortality	Y Child	Y Child	Y Child	Female Negative before death Male Negative after death	Female Negative before death Male Negative after death

Notes: DHS = Demographic & Health Surveys; HSE = Household Socio-Economic; KDHS = Kenya Demographic & Health Survey; MICS = Multiple Indicator Cluster Survey; C-SAFE = Consortium for Southern Africa Food Emergency; WFP = World Food Program; OVC = orphans and vulnerable children; PWH = parents with HIV/AIDS; STI = sexually transmitted infection.

Table 2. Gender findings on systematic review of the effects of HIV on nutrition.

Study	Country	Sample	Control group	Gender		Analysed by gender		Child gender findings	Death of parent gender findings	Child and parent gender interaction
				Yes/No	Child/Parent	Yes/No	Child/Parent			
Bhargava (2005)	Ethiopia	National orphans in Ethiopia (2001–2002), ~1000	Non-orphans and non-AIDS orphans	Y	N	Y	N	–	–	–
Bridge, Kipp, Jhangri, Laing, and Konde-Lule (2006)	Uganda	Cross-sectional, questionnaire and anthropometric measures About 205 homes sampled	Children from non-AIDS affected households	Y Child Parent	Y Child Parent	Y Child Parent	Y Child Parent	No gender difference	No gender difference No negative effect for orphans on nutritional status	No interaction
Chatterji et al. (2005)	Rwanda and Zambia	Zambia: 496 primary caregivers 504 children, 563 adolescents Rwanda: 570 primary caregivers, 656 children, 402 adolescents	Orphans compared with vulnerable children Other children	Y Child Parent	N	Y Child Parent	N	–	–	–
Crampin et al. (2003)	Malawi	Population survey About 1106 children included	Non-orphans	Y Parent	N	Y Parent	N	–	–	–
Kamali et al. (1996)	Uganda	Rural population cohort 10,000, 52% <15 yrs	Non-orphans	Y Parent	N	Y Parent	N	–	–	–
Lindblade, Odhiambo, Rosen, and DeCock (2003)	Kenya	1999 with follow up in 2000, 1347 children at baseline, 78.3% follow-up	Non-orphans	Y Child Parent	Y Child Parent	Y Child Parent	Y Child Parent	No gender difference	Paternal death Negative effect on malnourishment	No interaction
Masmas et al. (2004a)	Guinea-Bissau	Approximately 1100 interviews (300 case children, 800 non-orphan controls)	Non-orphans	Y Child Parent (Maternal)	Y Child Parent	Y Child Parent	Y Child Parent	No gender difference On nutritional status	–	–



Table 2 (Continued)

Study	Country	Sample	Control group	Gender		Analysed by gender		Child gender findings	Death of parent gender findings	Child and parent gender interaction
				Yes/No	Child/Parent	Yes/No	Child/Parent			
Masmas et al. (2004b)	Guinea-Bissau	Approximately 1100 interviews (300 case children, 800 non-orphan controls)	Non-orphans	Y Child Parent (Maternal death only)	Y Child	Y Child	<i>No gender difference</i> On mortality	-	-	
Mishra et al. (2005)	Kenya	The 2003 KDHS About 9865 households	Positive and negative parents	Y Child Parent	Y Child (Sample size too small)	Y Child	<i>Male</i> Negative effect on stunting, being underweight and wasting	-	-	
Panpanich, Brabin, Gonani, and Graham (1999)	Malawi	Cross-sectional study (76 orphanage children, 137 village orphans, 80 village non-orphans)	Non-orphans	Y Child	Y Child	Y Child	<i>Female – in orphanages</i> Negative effect on malnourishment	Maternal death Negative effect on malnourishment	-	
Rivers, Silvestre, and Mason (2004)	Botswana Uganda Malawi	Analysis of: 30 DHS and MICS II surveys, two sub-national UNICEF surveys, six C-SAFE/WFP	Non-orphans	Y Child Parent	Y Child (Sample sizes small)	Y Child	<i>No gender difference</i> On health and nutritional status	-	-	
Ryder, Kamenga, Nkusu, Batter, and Heyward (1994)	Zaire	About 466 HIV + women, their children and fathers About 606 HIV- women, their children and the fathers	HIV- women and families	N	N	N	-	-	-	
Sarker, Neckermann, and Muller (2005)	Uganda	Cross-sectional survey (241 orphans, 278 non-orphan controls)	Non-orphans	Y Child Parent	Y Child	Y Child	<i>No gender difference</i> On health status	-	-	

Table 2 (Continued)

Study	Country	Sample	Control group	Gender		Analysed by gender		Child gender findings	Death of parent gender findings	Child and parent gender interaction
				Yes/No	Child/Parent	Yes/No	Child/Parent			
Watts et al. (2007)	Zimbabwe	Analysis of data from ~ 30,000 children	Non-orphans	Y	Y	Y	Y	No gender difference	Maternal death Heightened risk of stunting and being under-weight	No interaction
				Child	Child	Child	Parent	On health and nutritional status	Paternal death Heightened risk of stunting	Double parental death height-ened risk of being underweight

Notes: DHS = Demographic & Health Surveys; HSE = Household Socio-Economic; KDHS = Kenya Demographic & Health Survey; MICS = Multiple Indicator Cluster Survey; C-SAFE = Consortium for Southern Africa Food Emergency; WFP = World Food Program; OVC = orphans and vulnerable children; PWH = parents with HIV/AIDS; STI = sexually transmitted infection.

delivery (Caesarian section or vaginal delivery), for C Section girls were twice as likely to be infected compared to boys. Read et al. (2003, cited in Thorne et al., 2004) noted in a meta-analysis of HIV postnatal transmission via breastfeeding that boys were at a significantly greater risk of HIV infection than girls. Coovadia et al. (2007) monitored 1372 infants and found that of those who were HIV negative at six weeks, mixed breast and formula feeding was associated with increased HIV infection to the infant. In this study they reported on gender (49% males, 49% females) and showed that gender played no part in transmission. These data lend further support to the need for systematic investigation of gender within child HIV research.

Our original systematic reviews demonstrate the lack of attention given to gender considerations in key areas of the children and HIV literature. Of those that do analyse data with gender as a variable, findings are equivocal. Our review identifies females at a disadvantage for school attendance and achievement, with more mixed findings for nutritional status and bereavement outcomes. Male children may be at a disadvantage with respect to treatment resistance. Parental gender is much less well explored, with only four of 15 papers on bereavement reporting the gender of the deceased parent. We know that reporting orphan type in terms of parent gender is vital (Sherr, Varrall, Mueller, & JLICA Working Group 1, 2008). Individual settings and circumstances need to be taken into account given the lack of comprehensive data. No clear difference by gender was found within the cognitive development and HIV literature (Sherr et al., 2008, in press), however, as only four of 54 studies analysed by gender, conclusions are tentative. These findings need to be treated with caution given that the overall literature is inadequate, with gender often under reported and analysed.

Overall, the child literature is difficult to navigate. The neglect of gender information in parenting, a constant oversight of fathers and the focus on mothers may skew understanding. In studies of early childhood there is often incomplete gender data. This is most notable for babies, where the term “infant” supplants male and female infants, and the literature is invariably not disaggregated by gender. Even when gender is recorded, the data is often not analysed according to gender and thus data for evidence-based understanding (such as in transmission, infection, outcome, schooling, nutrition, bereavement and cognitive development) is not clarified by gender. Many major policies fail to provide gender data for young children. Global statistics are collected by gender only for those over 15 years of age. This was true for many reports such as World health Organisation,

Table 3. Gender findings for systematic review of studies on the effect of HIV and bereavement.

Study	Country	Sample	Control Group Yes/No	Gender Yes/No Child/Parent	Analysed by gender		Child Gender findings	Death of Parent Gender findings	Child and Parent gender interaction
					Yes/No Child/Parent	Yes/No Child/Parent			
Atwine, Cantor-Graae, and Bajunirwe (2005)	Uganda	11–15 yrs 123 case children (parent(s) died of AIDS), 110 controls	Non- orphans	Child Parent	Y Child Parent	Y Child Parent	No gender difference On psychological distress (orphans higher distress)	No interaction	
Bhargava (2005)	Ethiopia	The National Survey Orphans in Ethiopia (2001–2002) Approximately 1000	Non- orphans and non- AIDS	Y Child Parent (Maternal death)	Y Child	Y Child	Female Negative effect on emotional adjustment and social adjustment	–	
Cluver and Gardner (2006)	South Africa	6–19 yrs Thirty case/30 matched controls	Non- orphans	Y Child	Y Child	Y Child	No gender differences On psychological well-being	–	
Dowdney et al. (1999)	UK	2–16 yrs Sixteen boys, 29 girls matched controls	Y	Y Child Parent	Y Child Parent	Y Child Parent	No gender difference Psychological disturbance scores	No interaction	
Forehand et al (1999).	USA	6–11 yrs 20 case children 40 controls	Y	Y maternal death	N	Y	–	–	
Gregson et al. (2005)	Zimbabwe	15–18 yrs About 1523 teenagers population survey	Non-OVC	Y Child Parent	Y Child Parent	Y Child Parent	Female Increased risk of HIV infection, STI symptoms and teenage pregnancy	Maternal death Increased sex and marriage, no secondary school education, poor reproductive health.	Female maternal orphans Increased risk HIV poor reproductive health, commence- ment of sex and marriage, no sec- ondary school
Lee, Detels, Rotherham- Borus, and Duan (2007).	USA	11–18 yrs About 206 adoles- cents with PWH intervention, 207 control group	Y	Y Child Parent	Y Child	Y Child	Male Increased risk of depression	–	–
Lester et al. (2006)	USA	12–18 yrs About 423 adoles- cents intervention vs. no intervention	Y	Y Child Parent	Y Child	Y Child	Female increased risk of depression	–	–

Table 3 (Continued)

Study	Country	Sample	Control Group Yes/No	Gender Yes/No Child/Parent	Analysed by gender		Child Gender findings	Death of Parent Gender findings	Child and Parent gender interaction
					Yes/No Child/Parent	Yes/No Child/Parent			
Makame, Ani, and Grantham-McGregor (2002)	Tanzania	10–14 yrs Forty-one AIDS orphans, 41 controls	Y	Y Child	Y Child	Y Child	Female negative effect on internalising problems	-	-
Operario, Pettifor, Cluver, MacPhail, and Rees (2007)	South Africa	15–24 yrs About 11,904 cases national survey	Y	Y Child Parent	Y Child	Y Child	<i>Female</i> Increased risk of HIV infection, commencement of sex and multiple partners Male Increased risk of unprotected sex	-	-
Rotherham-Borus, Stein, and Lester (2006)	USA	11–18 yrs Longitudinal 6 year study, 288 (intervention vs. no intervention)	Y	Y Child Parent	Y Child	Y Child	<i>Female</i> Increased risk of emotional distress	-	-
Rotherham-Borus, Weiss, Alber, and Lester (2005)	USA	11–18 yrs Six year study About 414 adolescents	Y	Y Child Parent	Y Child	Y Child	Increased substance <i>No gender difference</i> On psychosocial adjustment	-	-
Sengendo, and Nambi (1997)	Uganda	About 172 orphans (6–20 yrs), 24 controls	Y	Y Parent	Y Parent	Y Parent	-	<i>Maternal death</i> Increased risk of depression	-
Wolchik, Tein, Sandler, and Ayers (2006)	USA	Mean age 11.46, 339 cases longitudinal	Y	Y Child	Y Child	Y Child	<i>Female</i> Negative effect on fear of abandonment, internalising problems and self-esteem	-	-
Wood, Chase, and Aggleton (2006)	Zimbabwe	7–22 yrs Fifty-six OVC, 41 adults	N	N	N	N	-	-	-

UNAIDS and international country data sets. Treatment need, uptake, rollout, cotrimoxicol availability were all not recorded according to gender in global statistics. It is crucial to know of any gender considerations in terms of treatment access and availability. Not surprisingly there appears to be a lack of gender focus in programmatic provision for young children; girl children run a risk of discrimination whilst boy children may be overlooked.

Despite well-established gender challenges in later life, the omission of gender data from current policy and research leads to ignorance by neglect. Gender needs to be routinely monitored and analysed in research with young children. Clear gender differences in early adulthood, such as distribution of HIV infection by age, treatment access and adherence cannot be traced to childhood if no data are available. Data on gender variation and outcome are urgently needed to inform policy and research. Inattention to gender differences in infancy may create irreversible foundations for complex disparities and discrimination.

## References

- Ainsworth, M., Beegle, K., & Koda, G. (2005). The impact of adult mortality and parental deaths on primary schooling in North-Western Tanzania. *Journal of Development Studies*, 41(3), 412–439.
- Akresh, R. (2004). Adjusting household structure: School enrolment impacts of child fostering in Burkina Faso. BREAD working paper No. 089.
- Alderman, H., Hoddinott, J., & Kinsey, B. (2006). Long term consequences of early childhood malnutrition. *Oxford Economic Papers*, 58, 450–474.
- Andersson, N., Cockcroft, A., & Shea, B. (2008). Gender-based violence and HIV: Relevance for HIV prevention in hyperendemic countries of southern Africa. *AIDS*, 22(Suppl. 4), S73–S86.
- Arrivé, E., Newell, M., Ekouevi, D.K., Chaix, M., Thiebaut, R., Masquelier, B., et al. (2007). Prevalence of resistance to nevirapine in mothers and children after single-dose exposure to prevent vertical transmission of HIV-1: A meta-analysis. *International Journal of Epidemiology*, 36, 1009–1021.
- Atwine, B., Cantor-Graae, E., & Bajunirwe, F. (2005). Psychological distress among AIDS orphans in rural Uganda. *Social Science and Medicine*, 61, 555–564.
- Belden, K.A., & Squires, K.E. (2008). HIV infection in women: Do sex and gender matter? *Current Infectious Disease Report*, 10(5), 423–431.
- Bennell, P. (2005). The impact of the AIDS epidemic on the schooling of orphans and other directly affected children in sub-Saharan Africa. *The Journal of Development Studies*, 41(3), 467–488.
- Bhana, D. (2007). Childhood sexuality and rights in the context of HIV/AIDS. *Culture. Health and Sexuality*, 9(3), 309–324.
- Bhargava, A. (2005). AIDS epidemic and the psychological well-being and school participation of Ethiopian orphans. *Psychology Health and Medicine*, 10(3), 263–275.
- Bicego, G., Rutstein, S., & Johnson, K. (2003). Dimensions of the emerging orphan crisis in sub-Saharan Africa. *Social Science and Medicine*, 56, 1235–1247.
- Bridge, A., Kipp, W., Jhangri, G.S., Laing, L., & Konde-Lule, J. (2006). Nutritional status of young children in AIDS-affected households and controls in Uganda. *American Journal of Tropical Medicine and Hygiene*, 74(5), 926–931.
- Case, A., & Ardington, C. (2005). *The impact of parental death on school enrolment and achievement: Longitudinal evidence from South Africa*. Princeton, NJ: Princeton University Manuscript.
- Case, A., Paxson, C., & Ableidinger, J. (2004). Orphans in Africa: Parental death, poverty, and school enrolment. *Demography*, 41(3), 483–508.
- Chatterji, M.C., Dougherty, L., Ventimiglia, T., Mulenga, Y., Jones, A., Mukaneza, A., et al. (2005). *The well-being of children affected by HIV/AIDS in Gitarama Province, Rwanda, and Lusaka, Zambia: Findings from a study* (Community REACH Working paper No. 2). Washington, DC: Community REACH program, Pact.
- Cluver, L., & Gardner, F. (2006). The psychological well-being of children orphaned by AIDS in Cape Town, South Africa. *Annals of General Psychiatry*, 5(8) (online publication).
- Coovadia, H.M., Rollins, N.C., Bland, R.M., Little, K., Coutoudis, A., Bennish, M.L., et al. (2007). Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: An intervention cohort study. *Lancet*, 369, 1107–1116.
- Crampin, A.C., Floyd, S., Glynn, J.R., Madise, N., Nyondo, A., Khondowe, M.M., et al. (2003). The long term impact of HIV and orphanhood on the mortality and physical well-being of children in rural Malawi. *AIDS*, 17, 389–397.
- Delaugerre, C., Warszawski, J., Chaix, M.L., Veber, F., Macassa, E., Buseyne, F., et al. (2007). Prevalence and risk factors associated with antiretroviral resistance in HIV-1-infected children. *Journal of Medical Virology*, 79, 1261–1269.
- Dowdney, L., Wilson, R., Maughan, B., Allerton, M., Schofield, P., & Skuse, D. (1999). Psychological disturbance and service provision in parentally bereaved children: Prospective case-control study. *BMJ*, 319, 354–357.
- European Collaborative Study. (2002). Level and pattern of HIV-1 RNA viral load over age: Differences between girls and boys? *AIDS*, 16, 97–104.
- European Collaborative Study. (2003). Are there gender and race differences in cellular immunity patterns over age in infected and uninfected children born to HIV



- infected women? *Journal of Acquired Immune Deficiency Syndrome*, 33, 635–41
- Evans, D.K., & Miguel, E. (2007). Orphans and schooling in Africa: A longitudinal analysis. *Demography*, 44(1), 35–57.
- Forehand, R., Pelton, J., Chance, M., Armistead, L., Morse, E., Morse, P., et al. (1999). Orphans of the AIDS epidemic in the United States: Transition-related characteristics and psychological adjustment at 6 months after mother's death. *AIDS Care*, 11(6), 715–722.
- Gabiano, C., Tovo, P.A., de Martino, M., Galli, L., Giaquinto, C., Loy, A., et al. (1992). Mother-to-child transmission of human immunodeficiency virus type 1: Risk of infection and correlates of transmission. *Pediatrics*, 90(3), 369–374.
- Grantham-McGregor, S.M., Walker, S.P., & Chang, S. (2000). Nutritional deficiencies and later behavioural development. *Proceedings of the Nutrition Society*, 59, 47–54.
- Gregson, S., Nyamukapa, C.A., Garnett, G.P., Wambe, M., Lewis, J.J., Mason, P.R., et al. (2005). HIV infection and reproductive health in teenage women orphaned and made vulnerable by AIDS in Zimbabwe. *AIDS Care*, 17(7), 785–794.
- Kamali, A., Seeley, J.A., Nunn, A.J., Kengeya-Kayondo, J.F., Ruberantwari, A., & Mulder, D.W. (1996). The orphan problem: Experience of a sub-Saharan Africa rural population in the AIDS epidemic. *AIDS Care*, 8(5), 509–516.
- Lee, S., Detels, R., Rotherham-Borus, M., & Duan, N. (2007). The effect of social support on mental and behavioural outcomes among adolescents with parents with HIV/AIDS. *American Journal of Public Health*, 97(10), 1820–1826
- Lester, P., Rotherham-Borus, M.-J., Lee, S.-J., Comulada, S., Cantwell, S., Wu, N., et al. (2006). Rates and predictors of anxiety and depressive disorders in adolescents of parents with HIV. *Vulnerable Children and Youth Studies*, 1(1), 81–101.
- Lindblade, K.A., Odhiambo, F., Rosen, D.H., & DeCock, K.M. (2003). Health and nutritional status of orphans <6 years old cared for by relatives in western Kenya. *Tropical Medicine and International Health*, 8(1), 67–72.
- Liu, J., Raine, A., Venables, P.H., Dalais, C., & Mednick, S.A. (2003). Malnutrition at age 3 years and lower cognitive ability at age 11 years. *Archives of Pediatrics and Adolescent Medicine*, 157, 593–600.
- Makame, V., Ani, C., & Grantham-McGregor, S. (2002). Psychological well-being of orphans in Dar El Salaam, Tanzania. *Acta Paediatrica*, 91, 459–465.
- Masmas, T.N., Jensen, H., da Silva, D., Hoj, L., Sandstrom, A., & Aaby, P. (2004a). The social situation of motherless children in rural and urban areas of Guinea-Bissau. *Social Science and Medicine*, 59, 1232–1239.
- Masmas, T.N., Jensen, H., da Silva, D., Hoj, L., Sandstrom, A., & Aaby, P. (2004b). Survival among motherless children in rural and urban areas of Guinea-Bissau. *Acta Paediatrica*, 93, 99–105.
- Mishra, V., Arnold, F., Otieno, F., Cross, A., & Hong, R. (2005). Education and nutritional status of orphans and children of HIV-infected parents in Kenya. DHS working papers, USAID.
- Monasch, R., & Boerma, J.T. (2004). Orphanhood and childcare patterns in sub-Saharan Africa: An analysis of national surveys from 40 countries. *AIDS*, 18(Suppl. 2), S55–S65.
- Nyamukapa, C., & Gregson, S. (2005). Extended family's and women's roles in safeguarding orphans' education in AIDS-afflicted rural Zimbabwe. *Social Science and Medicine*, 60, 2155–2167.
- Operario, D., Pettifor, A., Cluver, L., MacPhail, C., & Rees, H. (2007). Prevalence of parental death among young people in South Africa and risk for HIV infection. *Journal of Acquired Immune Deficiency Syndrome*, 44(1), 93–98.
- Panpanich, R., Brabin, B., Gonani, A., & Graham, S. (1999). Are orphans at increased risk of malnutrition in Malawi? *Annals of Tropical Paediatrics: International Child Health*, 19(3), 279–285.
- Read, J.S., Newell, M.L., Leroy, V., & Dabis, F. (2003, February 10–14). *Late postnatal transmission of HIV in breastfed children: An individual patient data meta-analysis (BHITS)*. Paper presented at: 10th Conference on Retrovirus and Opportunistic Infections. Abstract 97.
- Rivers, J., Silvestre, E., & Mason, J. (2004). *Nutrition and food security status of orphans and vulnerable children*. Washington, DC: US, International Food Policy Research Institute.
- Rotherham-Borus, M.J., Stein, J.A., & Lester, P. (2006). Adolescent adjustment over six years in HIV-infected families. *Journal of Adolescent Health*, 39, 174–182.
- Rotherham-Borus, M.J., Weiss, R., Alber, S., & Lester, P. (2005). Adolescent adjustment before and after HIV-related parental death. *Journal of Consulting and Clinical Psychology*, 73(2), 221–228.
- Ryder, R.W., Kamenga, M., Nkusu, M., Batter, V., & Heyward, W.L. (1994). AIDS orphans in Kinshasa, Zaire: Incidence and socioeconomic consequences. *AIDS*, 8(5), 673–679.
- Sarker, M., Neckermann, C., & Muller, O. (2005). Assessing the health status of young AIDS and other orphans in Kampala, Uganda. *Tropical Medicine and International Health*, 10(30), 210–215.
- Sengendo, J., & Nambi, J. (1997). The psychological effect of orphan hood: A study of orphans in Rakai district. *Health Transition Review*, 7(Suppl.), 105–124.
- Sharma, M.P. (2006). Orphanhood and schooling outcomes in Malawi. *American Journal of Agricultural Economics*, 88(5), 1273–1278.
- Sherr, L., Mueller, J., Varrall, R., & JLICA Working Group 1. (2008, in press). A systematic review of cognitive development and child HIV infection. *Psychology Health and Medicine*.
- Sherr, L., Varrall, R., Mueller, J., & JLICA Working Group 1. (2008). A systematic review on the mean-



- ing of the concept 'AIDS Orphan': Confusion over definitions and implications for care. *AIDS Care*, 20(5). *AIDS Impact Special Issue*, 527–536.
- Simoni, J.M., Montgomery, A., Martin, E., New, M., Demas, P.A., & Rana, S. (2007). Adherence to antiretroviral therapy for pediatric HIV infection: A qualitative systematic review with recommendations for research and clinical management. *Pediatrics*, 119, e1371–e1384.
- Temmerman, M., Nyong'o, A.O., Bwayo, J., Fransen, K., Coppens, M., & Piot, P. (1995). Risk factors for mother-to-child transmission of human immunodeficiency virus-1 infection. *American Journal of Obstetrics & Gynecology*, 172, 700–705.
- Thorne, C., Newell, M.L. (2004). European collaborative study. Are girls more at risk of intrauterine acquired HIV infection than boys? *AIDS*, 18, 344–347.
- Tremblay, G.C., & Israel, A.C. (1998). Children's adjustment to parental death. *Clinical Psychology: Science and Practice*, 5, 424–438.
- Watts, H., Gregson, S., Saito, S., Lopman, B., Beasley, M., & Monasch, R. (2007). Poorer health and nutritional outcomes in orphans and vulnerable young children not explained by greater exposure to extreme poverty in Zimbabwe. *Tropical Medicine and International Health*, 12(5), 584–593.
- Wolchik, S.A., Tein, J., Sandler, I.N., & Ayers, T.S. (2006). Stressors, quality of the child-caregiver relationship, and children's mental health problems after parental death: The mediating role of self-system beliefs. *Journal of Abnormal Child Psychology*, 34(2), 221–238.
- Wood, K., Chase, E., & Aggleton, P. (2006). Telling the truth is the best thing': Teenage orphans' experiences of parental AIDS-related illness and bereavement in Zimbabwe. *Social Science and Medicine*, 63, 1923–1933.
- Yamano, T., & Jayne, T.S. (2005). Working-age adult mortality and primary school attendance in rural Kenya. *Economic Development and Cultural Change*, 53, 619–653.