Differential probabilities of foster child residence across households during African AIDS epidemic

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Abstract

Child fostering—the sending of children to be reared by non-natal families for a temporary period of time–is a social institution that plays a pivotal role in safeguarding children and families in sub-Saharan Africa. The AIDS epidemic and resulting surge in the number of orphans in the region has raised considerable questions about whether child fostering systems are being overwhelmed. By examining the differential probabilities of fostering across households, this study establishes the normative patterns of fostering across socio-economic groups in 20 sub-Saharan African countries. It then goes on to examine if and how those patterns change over the course of each country's unique AIDS epidemic. Despite evidence of struggle in certain countries, results, on the whole, indicate the remarkable resilience of fostering systems in the majority of countries, despite high adult HIV prevalence levels.

1 Introduction

Child fostering is arguably one of the most important social institutions for families in sub-Saharan Africa, where childbearing is nearly universal and total fertility rates have been persistently high throughout recorded history (Bongaarts and Casterline 2013). The practice of child fostering—that is, sending children to be reared by non-natal families for temporary periods of time—affords families the opportunity to distribute the costs and benefits of childrearing across kinship networks as needed (Akresh 2005; Caldwell 1997; Eloundou-Enyegue and Shapiro 2004; Isiugo-Abanihe 1985).

A recent source of controversy in research on African families is whether, and to what extent, the institution of child fostering has been undermined by the HIV/AIDS epidemic in the region. Some argue that high young-adult mortality rates, coupled with an increasing population of orphans, are stressing the institution of child fostering to the detriment of host families and posit that traditional childcare mechanisms are being overwhelmed (Bicego et al. 2003; Foster 2000; Nyambedha et al. 2003). On the other hand, substantial evidence indicates that households have shown remarkable ability to absorb both orphaned and non-orphaned foster children (Monasch and Boerma 2004; Grant and Yeatman 2012; Hosegood et al. 2007).

Despite the wide-spread concern that the practice of fostering is changing, and to the detriment of families, there are no empirical estimates of changes to the institution as a whole. Nor do we know how much—if any—of those change can be attributed to the AIDS epidemic. In this paper I argue that examining foster child residence patterns across socioeconomic groups over the course of the AIDS epidemic provide a window through which to evaluate if the institution of child fostering is in crisis. Specifically, this paper asks the following question: Has there has been a shift towards poorer households hosting foster children or have the wealthiest household consistently cared for foster children over the course of the AIDS epidemic?

To answer this question I use repeated cross-sectional data from 20 countries in sub-

Saharan Africa. I explicitly look at *changes* to the differential probabilities of fostering across socio-economic groups within countries. This acknowledges the heterogeneity of the AIDS epidemic in terms of absolute levels of prevalence as well as temporal patterns (e.g., early and late peaks in adult prevalence levels).

2 Child fostering as a social institution

Tribal and extended kinship structures endow much of sub-Saharan Africa with a strong tradition of child fostering (Bledsoe 1990; Bledsoe and Isiugo-Abanihe 1989; Goody 1982; Madhavan 2004; Monasch and Boerma 2004; Urassa et al. 1997) and the practice of sending children to be reared temporarily by non-natal families is quite common. In Ghana, for example, children spend approximately 18 percent of their childhood years living away from their mothers (Lloyd and Desai 1992) .

Child fostering serves many purposes in sub-Saharan Africa and there are a variety of reasons for a child to be reared outside of his or her natal home. In a context characterized by high levels of economic- and health-related uncertainty (Johnson-Hanks 2004, 2006; Trinitapoli and Yeatman 2011), child fostering can act as a social safety net for families and children. In the absence of strong government welfare programs, the social institution of fostering safeguards children in the event of the death of a parent, divorce, or household economic crisis (Goody 1982; Madhavan 2004).

But crisis management is not the root of all fostering. Child fostering is also used as a form of social cohesion among extended family networks (Bledsoe and Isiugo-Abanihe 1989) and as a tool for smoothing out demographic inequalities, such as childlessness or gender composition of existing children (Bledsoe and Isiugo-Abanihe 1989; Isiugo-Abanihe 1985; Lloyd and Desai 1992). Perhaps most importantly, child fostering is also used as a means of expanding children's opportunities for upward social mobility. This takes place particularly in the form of access to education (Ainsworth and Filmer 2006; Akresh 2009; Bledsoe 1990;

Isiugo-Abanihe 1985). Children whose natal families live far from primary schools are often sent to live with extended family members in more urban areas (Akresh 2005; Eloundou-Enyegue and Stokes 2002). One multi-country study in southeast Africa found that children with highly educated mothers were more likely to be fostered, suggesting that educated parents may use their social capital to facilitate educational opportunities for their children (McDaniel and Zulu 1996).

2.1 Norms of foster child residence patterns

As with any social institution, child fostering is governed by norms, some of which dictate where foster children are placed. While it varies from setting to setting, children are typically fostered by extended family members, rather than strangers (Dahl 2009; Nyambedha et al. 2003)[1] and in accordance with lineage customs (i.e., patriarchal or matriarchal) (Goody 1982). Given that families who foster children become responsible for the childs basic needs (i.e. health care, food, and education), it stands to reason that foster children are placed in relatively wealthier households where possible. In fact, early ethnographic work on child fostering suggests that foster children were often selectively placed with wealthier families when possible, allowing natal parents to avoid some of the costs associated with childrearing (Goody 1982; Isiugo-Abanihe 1985).

This idea of selective socio-economic placement of foster children has been supported by a number of more recent studies. Using data from 21 countries in sub-Saharan Africa, Beegle and colleagues (2010) found that foster children typically resided in better-off households and that this selective placement operates to a higher degree for orphans. Even when foster children are not found in relatively wealthier households, evidence suggests that selective socio-economic placement operates at a regional level, with orphans having an increased likelihood of residing in wealthier communities (Weinreb et al. 2008). Additionally, rural to urban flows are common among foster children, meaning that foster chidden are often

[1] Although, in some circumstances, children are fostered by tribal chiefs as a means to forge family bonds (Goody 1982)

placed in relatively more resource-rich households (Eloundou-Enyegue and Stokes 2002; Kabore and Pilon 2006). Finally, more recent research in Malawi suggests that, under certain circumstances, households that take in foster children experience gains in wealth over time (Bachan 2014). While this latter evidence suggests that foster child residence patterns along socio-economic groups might be more about reciprocity than selective placement, the overwhelming evidence suggests foster children tend to reside in more resource-rich households.

3 Child fostering in the era of AIDS

Child fostering has been a feature of the African family long before the AIDS epidemic (Madhavan 2004). But AIDS has shined a new spotlight on child fostering in sociological, anthropological, and economic research. This is largely due to the increased number of orphans and resulting expansion of childcare responsibilities. Between 1990 and 2009, the number of children in sub-Saharan Africa who lost one or both parents to AIDS increased from less than one million to 14.8 million (UNAIDS 2007, 2010). Amidst these demographic shifts, there have been concerns about changes to the African family that could undermine the institution of child fostering. Scholars warn that increased nuclearization of family units could decrease obligations to help extended kin with childrearing responsibilities (Dahl 2009; Foster 2000; Wusu and Isiugo-Abanihe 2006). Together, the "orphan crisis" and the nuclearization of African families divided researchers on whether established family foster care systems would buckle under the pressure of increased fostering needs.

Certainly AIDS is a unique shock to family systems and there is ample evidence that it reduces the viability of household units. In Zimbabwe—a country with a particularly high HIV prevalence rate—health-care expenditures were highest among households that experienced an AIDS-related death and that the likelihood of dissolution was greatest among households that had a member die of AIDS (Gregson et al. 2007). Such evidence highlights the economic impact of AIDS and raises additional questions about whether family members

can afford to care for additional children (Seeley et al. 1993).

Shifts towards poorer households caring for orphans is often cited as evidence that the institution of child fostering is being overwhelmed, and such trends have been documented in some of the countries hardest hit by the AIDS epidemic (Bicego et al. 2003). Additionally, the rise in young-adult mortality has disproportionately placed the burden of fostering on uncharacteristically young adults or grandparents (Beegle et al. 2010), the latter arrangement leading to a marked increase in "skipped generation" households in some parts of the continent (Merli and Palloni 2006). The diminished earning capacity of extremely young or old caregivers may contribute to increasing the burden of childcare on poorer households.

Despite fears of eroding family systems in the face of AIDS, a number of scholars posit that the flexibility of the African family is a considerable strength in the face of demographic and social changes. In the midst of the epidemic, Caldwell (1997) predicted that, despite the great stress that orphanhood would place on society, Africa was best poised to deal with increased number of orphans because of the fostering norms throughout the region. It is recognized that "traditional" family forms in sub-Saharan Africa are highly adaptable to environmental circumstances—particularly in an environment of great political, environmental, and economic uncertainty (Johnson-Hanks and Chung 2013). Even if family systems and units change, the environment of uncertainty in which they exist is likely to remain, meaning that families must remain flexible in their ability to help extended kin (Johnson-Hanks and Chung 2013).

A distinct body of research supports these premises and underscores the considerable resilience of extended family systems to care for both orphans and non-orphans. Using regional data from 14 countries in sub-Saharan Africa, Grant and Yeatman (2012) find that most households are able to absorb orphans while also fostering non-orphans. Only in high-prevalence areas is the need to care for orphans beginning to displace opportunities for non-orphan fostering. Additionally, contrary to journalistic impressions, significant increases in Western-style orphanages, child-headed households, and street children have not been

documented (Heuveline 2004; Monasch and Boerma 2004). This suggests that the institution of child fostering has remained largely intact despite the AIDS epidemic.

Unfortunately, since the onset of AIDS very few studies have assessed changes in the institution of child fostering as a whole. Rather, research addressing the viability of child fostering systems has disproportionately focused on the living arrangements of orphans. While this child-centered research has provided a wealth of information about some of the most vulnerable populations in sub-Saharan Africa, it cannot be used to draw any comprehensive conclusions about the viability of the African institution of child fostering. The institution of child fostering is underwritten by private households, and thus our understanding of how the institution might be changing can benefit greatly from research that takes a household-centered approach. Additionally, child fostering involves *both* orphans and non-orphans. Thus, considering only orphans provides only a partial picture of child fostering systems.

4 The current study

This study expands upon previous studies that examine the living arrangements of orphans in four key ways. First I take a household-centered approach, which acknowledges that the institution of child fostering is supported by private households. Second, this study considers the fostering of all children, rather than just orphans. Third, I empirically examine the health of fostering systems across a number of countries *before* the peak of the AIDS epidemic. Establishing the baseline state of fostering systems allows us to understand what changes might be attributable to AIDS and examining many countries captures a variety response patterns. Finally, I examine subsequent changes to fostering systems that take place *in concert* with the epidemic. This allows for observing nuance patterns of response to AIDS and possible reversals of fostering patterns across households.

To accomplish this, I use foster child residence patterns across socio-economic groups as

a lever by which to examine the health of fostering institutions. Our knowledge of normative foster child residence patterns provides us with a picture of what a "healthy" fostering system should look like. If selective placement is a means of opportunity for children, a "healthy" system should reflect patterns by which relatively resource-rich households have the highest probability of fostering a child and the least resource-rich household have the lowest probability. If this pattern is reversed, and poorer households take on a higher probability of fostering a child than wealthier households, such a pattern would indicate that the social institution of child fostering is being stressed. The question of whether the AIDS epidemic has disrupted the institution of child fostering rests, in part, on our ability to determine whether and how the patterns of differential probability of fostering across socio-economic groups change in concert with the epidemic. It is also paramount to establish that child fostering systems were healthy before the AIDS epidemic peaked.

Because child fostering is, to a certain degree, heterogeneous across countries and because the AIDS epidemic has unfolded differently in different settings, there are numerous ways in which such patterns could have shifted over the past 25 years. But, generally, in countries where child fostering systems are being stressed, we might expect the pattern to shift from healthy to unhealthy as the AIDS epidemic progressed—that is for either resource-rich households to experience a decrease in the probability of fostering over time and/or for poorer household to experience an increase in probability of fostering. We may also observe no shift in the patterns of differential fostering across socioeconomic groups. The resilience of fostering systems may be evident when the pattern remains healthy over the course of the epidemic. The pattern could also remain unhealthy throughout the epidemic, suggesting that foster systems struggle with and without AIDS.

4.1 Data

This paper utilizes household roster data from 62 Demographic and Health Surveys (DHS) administered between 1990 and 2012 in 20 countries across sub-Saharan Africa. The DHS

are standardized and nationally representative surveys, allowing for meaningful comparison across countries and over time. The household rosters contain extensive information about all *de jure* residents, including parental co-residence and paternal vital status for children under 14, making them particularly well-suited for the current research objectives.

Countries were included in the sample if they had at least two surveys since 1990.[2] This timeframe was selected for two reasons: first, HIV prevalence estimates are rarely made for years before 1990; and second, because the DHS administered before this period did not contain the necessary questions to construct a wealth index, which I leverage in my analytic approach (discussed below) (DHS User Forum 2013). Table 1 lists the countries that met this criteria along with the corresponding surveys and sample sizes. These countries represent three geographical regions: West Africa, where the literature establishes the strongest traditions of child fostering and where HIV prevalence has been low, and Southern and East Africa, where the HIV/AIDS epidemics were most severe and where child fostering also occurs frequently (McDaniel and Zulu 1996). Taken together, these countries also provide a wide range of patterns of the HIV epidemic, in terms of both prevalence level and timing of onset. For conceptual reasons, I categorize countries in my sample into 4 mutually exclusive categories that calibrate two dimensions of the AIDS epidemic: peak prevalence level (among adults ages 15–49) and the year in which prevalence peaked (before and after 2000). Table 2 shows where countries are categorized in this two-by-two matrix.

The DHS also collects biomarker data from respondents; but the surveys only began conducting population-based HIV testing in 2001. Therefore, in order to map the trajectory of the AIDS epidemic within each country, I use HIV prevalence estimates from the World Health Organization data repository, which are estimated by UNAIDS. There are many indicators in which to measure the AIDS epidemic. For this research, I use adult HIV prevalence (ages 15-49). I choose to focus on prevalence rather than incidence or mortality

[2]The 1999 survey for Nigeria does not contain a DHS household wealth index (DHS User Forum 2014). In communication with a DHS employee about constructing a wealth index for this survey, I was advised not to use this survey at all.

levels because this measure best captures the AIDS related environment and because children are not only fostered as a result of the death or infection of a parent (Robson 2000; UNAIDS and BLCA 1999; Young and Ansell 2003).

4.1.1 Dependent Variable

For the multivariate models, the primary outcome of interest is a binary variable indicating whether a household is fostering any child (1=fostering). A household is fostering if a child under the age of 14 is living in the household in the absence of his or her parents.[3] This focus on *households* rather than children is driven by the fact that child fostering systems are underwritten by families. Additionally, I chose to look at the fostering of any child rather than specifically fostering orphans because it best represents the fostering system as a whole. A child need not be orphaned in order to be displaced into another household as a result of AIDS (UNAIDS and BLCA 1999). In addition to the death of a parent, children in high prevalence countries often move because a parent is ill (i.e. prior to death) or because they are tasked with caring for a sick relative (Robson 2000; Young and Ansell 2003).

4.1.2 Independent Variables

I use the DHS household wealth index as the primary independent variable of interest in the multivariate models. The DHS wealth index utilizes a households ownership of selected goods (e.g., bicycle, refrigerator, phone, etc.) and facilities (e.g., water and sanitation) placing households on a continuous scale relative to the sample (Filmer and Pritchett 2001; Howe et al. 2008; Rutstein and Johnson 2004). This asset-based approach to measuring socio-economic positioning and has been validated by a number of researchers (Filmer and Pritchett 2001; Howe et al. 2008). This variable is estimated in the multivariate models by a set of dummy variables for each quintile of a country's wealth distribution (with the poorest quintile as the reference category). The multivariate models also include a continuous

[3]The definition of "child" varies from survey to survey in the DHS. I define children as 14 years or younger because the parental status questions are consistently asked across surveys for this age group.

Table 1 Surveys included in sample and corresponding sample size (as measured by number of households)

Survey	Analytic N	Full N	Survey	Analytic N	Full N
Burkina Faso			**Mali**		
1993	5,111	5,143	1996	8,699	8,716
2003	9,066	9,097	2001	12,293	12,331
2010	14,422	14,424	2006	12,978	12,998
Cameroon			**Mozambique**		
1991	3,529	3,538	1997	9,171	9,282
1998	4,687	4,697	2003	12,302	12,315
2004	10,455	10,462	2011	13,808	13,919
2011	14,207	14,214	**Namibia**		
Chad			1992	4,004	4,101
1997	6,838	6,840	2000	6,355	6,392
2004	5,369	5,369	2007	9,176	9,200
Cote d'Ivoire			**Niger**		
1994	5,926	5,935	1998	5,906	5,928
2012	9,678	9,686	2012	10,742	10,750
Ethiopia			**Nigeria**		
2000	14,067	14,072	1990	8,927	8,999
2005	13,704	13,721	2003	7,204	7,225
2011	16,700	16,702	2008	33,947	34,070
Ghana			**Rwanda**		
1993	5,820	5,822	1992	6,174	6,252
1998	5,986	6,003	2000	9,686	9,696
2003	6,232	6,251	2010	12,535	12,540
2008	11,765	11,778	**Tanzania**		
Guinea			1996	7,954	7,969
1999	5,077	5,090	1999	3,613	3,615
2012	7,105	7,109	2004	9,726	9,735
Kenya			2010	9,620	9,623
1993	7,891	7,950	**Uganda**		
1998	8,361	8,380	1995	7,500	7,550
2003	8,539	8,561	2001	7,874	7,885
Madagascar			2006	8,867	8,870
1997	7,160	7,171	2011	9,028	9,033
2004	8,414	8,420	**Zambia**		
2009	17,846	17,857	1996	7,285	7,286
Malawi			2002	7,124	7,126
1992	5,308	5,323	2007	7,162	7,164
2000	14,206	14,213	**Zimbabwe**		
2004	13,639	13,664	1994	5,979	5,984
2010	24,798	24,825	1999	6,363	6,369
			2005	9,271	9,285
			2010	9,756	9,756

measure for the age of the household head and a dummy variable indicating if the head of the household is female.

4.1.3 Data-related considerations

The DHS data are widely used for research on families in Africa and offer particular advantages for this line of research, however they are not without limitations. Three limitations are especially note-worthy. First, the DHS does not collect information on children who are living in institutionalized foster case (i.e. orphanages). While studies from southern Africa show that the vast majority of orphans (as much as 90%) were not living in orphanages during the height of the epidemic (**???**Monasch and Boerma 2004; **?**), my analysis is unable to account for fostering that is taking place outside of family systems. If orphanages are being substituted for family foster care, then my estimates of how the probability of households fostering children changed may be too conservative (that is, if we assume that institutionalized foster care is used as an alternative to placing children with poorer families).

Second, while I am proposing to look at change over time, the DHS data are cross-sectional for each year in which they were collected. In other words, they do not represent information for the same individuals or households over time. Because of this, I will not be able to determine household SES at the precise time the child was placed in foster care. In other words, it is possible that household SES was high when the child was placed, but declined by the time the DHS survey was administered (or vice versa). However, recent research from Malawi provides evidence that, under certain circumstances, household wealth increases as a result of receiving a foster child, suggesting that families are not pulled into poverty as a result of fostering (Bachan 2014).

The third limitation is that the DHS does not collect information on the reasons why a child is being fostered or the type of household the child came from. Thus, we cannot make assumptions about whether or not the child is being fostered as a direct result of AIDS or if the child originated from a relatively wealthier or poorer household.

Table 2 Categorization of sample countries by pattern of HIV Epidemic

		Prevalence	
		Low (<5%)	High (>=5%)
Peak	Early(<2000)	Burkina Faso Ethiopia Madagascar Mali	Kenya Malawi Rwanda Tanzania Uganda Zambia Zimbabwe
	Late (>2000)	Chad Ghana Guinea Niger Nigeria	Cameroon Cote d'Ivoire Mozambique Namibia

4.2 Analytic Approach

To assess the relationship between household wealth and fostering a child, I fit separate logistic regression models of the odds of fostering a child for each of the 62 surveys included in the sample. Each model includes the covariates described above (with the exception of HIV prevalence). Missing data on key variables are rare (an average of 0.3 percent across all surveys); thus, list wise deletion was employed to deal with missing data (see Table 1 for a comparison of the full and analytic sample).

I use the results of these logistic regression models for three purposes. First, the results test the relationship between household wealth and child fostering in each of the 20 countries in the sample. They are then are used to establish the health of fostering systems before the epidemic among countries for which there is data before the peak of the epidemic. This is done by examining the likelihood of fostering for households from five distinct socio-economic groups. Finally, I map the patterns of differential likelihood of fostering over time for each country. Since it can not be assumed that logistic regression coefficients have identical error variances, the coefficients from the regressions may not necessarily be

comparable across surveys (Allison 1999; Mood 2010). To make meaningful comparisons for the second and third analytic purposes, I calculate predicted probabilities that households in each wealth quintile foster and use these as the basis for making comparisons over time, within countries. Predicted probabilities do not require the assumption of identical error variances; this approach has been employed previously by Beckfield and Sosnaud (2012) and championed by Mood (2010). To describe the association between the probability of fostering and the AIDS-epidemic, I present the results by mapping the predicted probabilities against yearly HIV prevalence rates as estimated by UNAIDS.

5 Results

5.1 Child Fostering and HIV/AIDS

Child fostering is common among all of the countries included in the sample. Averaged across all surveys within a country, the percentage of households fostering at least one child ranges from 13.8 to 33.4 (Nigeria and Namibia, respectively). Figure 1 illustrates the proportion of households fostering a child for each country (averaged across all surveys). With the exception of Rwanda, Kenya, and Guinea, there is a substantially larger proportion of households that fostered children in countries that have experienced a high-prevalence HIV/AIDS epidemic. In nine out of the ten countries where more than 20 percent of households were fostering a child, the epidemic peaked at an adult prevalence rate of five percent or higher.

Additionally, although the classic literature on child fostering focuses on West African countries, Figure 1 demonstrates that many of the countries in this region of the world have a lower proportion of fostering households than those in Southern Africa, where the epidemic has been most rampant. Taken together, these patterns indicate a positive relationship between fostering and the HIV/AIDS epidemic. This is hardly surprising given that the epidemic has increased the need for child care among extended family networks. Important to note, however, is that these data represent fostering that is taking place within private

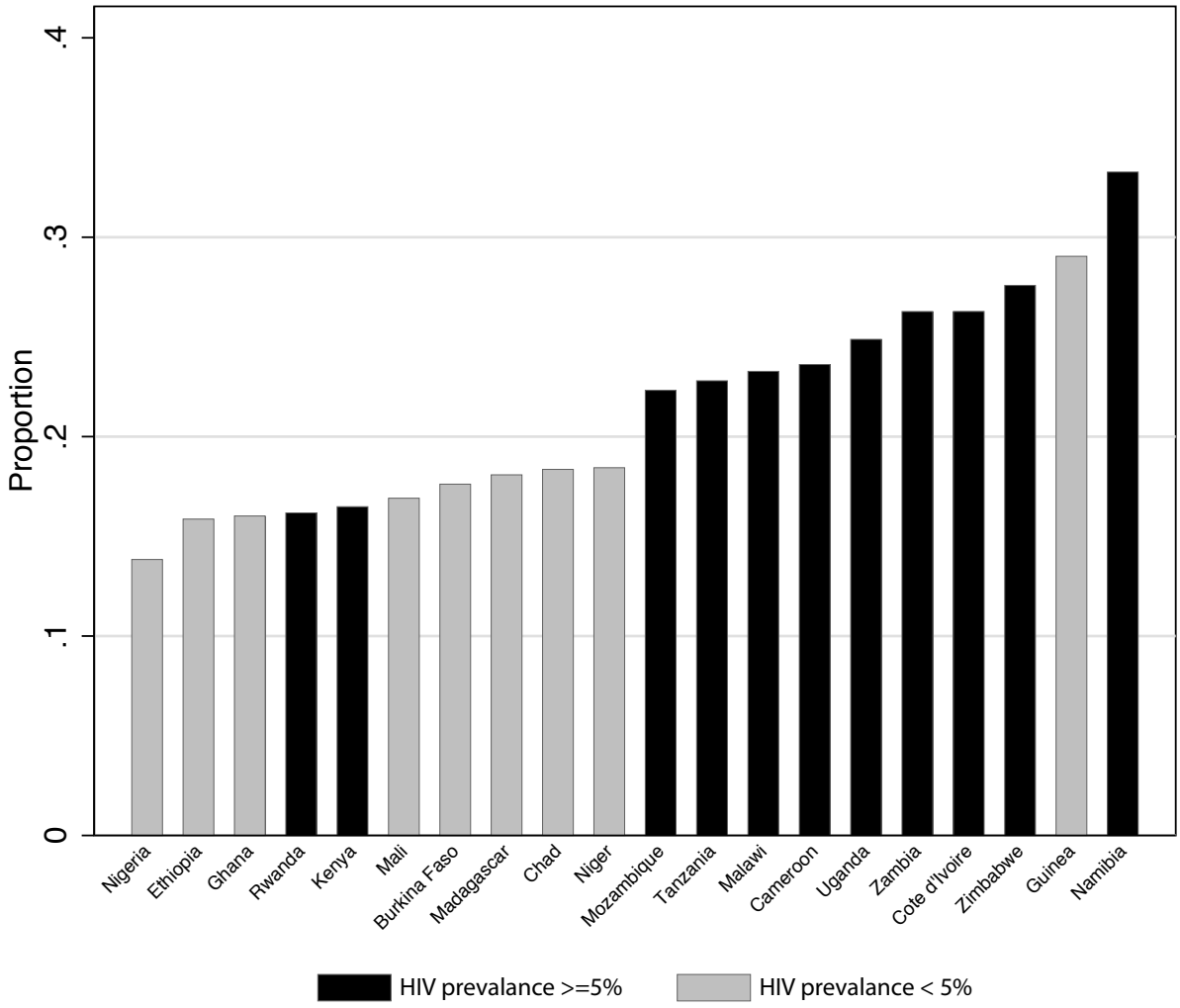

Fig. 1 Proportion of households fostering at least 1 child (averaged across all surveys within countries)

homes, rather than child-care institutions, suggesting that foster children were continuing to be absorbed by families even in high prevalence countries.

5.2 The relationship between wealth and fostering: Multivariate results

Table 3 summarizes the relationship between wealth and fostering from the results of the 62 regression models. The second column indicates the percent of surveys in which the

relationship between the given wealth quintile and odds of fostering were significant and the third and fourth column specifies the direction of the relationship. Controlling for the sex and age of household head, I find that in a majority of the surveys, being in the middle wealth quintile or higher is significantly related to the odds of fostering a child (compared to being in the lowest quintile). Furthermore, the odds of fostering are highest for the wealthiest households. Specifically, households in the highest wealth quintile had significantly greater odd of fostering compared to those in the lowest quintile in 73 percent of the 62 surveys.

Table 3 Summary of significant relationships between wealth quintiles* and fostering from 62 individual regressions

		Direction	
Quintile	Significantly Different (%)	Greater odds of fostering (%)	Lower odds of fostering(%)
Second	44	42	2
Middle	63	60	3
Fourth	68	58	10
Highest	89	73	16

**In comparison to lowest wealth quintile.*
All models control for age and sex of household head.

Yet, household wealth is not uniformly associated with a greater odds of fostering a child. In 16 percent of the surveys analyzed, being in the highest wealth quintile was associated with *reduced* odds of fostering compared to the lowest quintile. The ten surveys that fall into this category include Kenya 2003, Madagascar 2004 and 2009, and all of the Namibia and Zimbabwe surveys. With the exception of Madagascar, all of the countries that are characterized by a negative relationship between household wealth and fostering type experienced severe HIV epidemics, with adult prevalences ranging from 7.6 to 26.8 percent across the given survey years (Kenya 2003 and Zimbabwe 1999, respectively).

5.3 Establishing health of child fostering systems and examining change

Establishing the relationship between wealth and fostering, while informative, does not answer questions about how fostering as a social institution has—or has not—changed over the course of the HIV/AIDS epidemics experienced by each country. To do that, we must first establish the health of systems before the peak of the epidemic. Then we must examine deviations from that baseline health by looking at patterns in the differential probabilities of fostering among wealth quintiles over time.

For interpretation purposes I define a "healthy" fostering system as one in which the wealthiest households (5th quintile) have a significantly higher predicted probability of fostering than the poorest households (first quintile). I define "unhealthy" fostering systems as ones in which the poorest households have a significantly higher predicted probability of fostering relative to the wealthiest households. Of course, there are degrees along the healthy/unhealthy continuum. Ideally the healthiest systems would be ones in which the probabilities of fostering significantly increase from quintile to quintile. Less healthy systems, on the other hand, may be characterized by high probabilities of fostering in the second or third quintiles.

5.3.1 Health of fostering system before the peak of the epidemic

It has been implicitly assumed that fostering systems across sub-Saharan Africa were healthy before the AIDS epidemic began. However, heretofore this has been empirically unestablished. To assess this critical piece of information, I use data from the nine "early peak" countries in the sample (see Table 2) and from three "late peak" countries for which there was a survey administered before the peak of the epidemic (countries include Malawi, Mali, and Kenya).

Table 4 presents the probability of fostering for the poorest and wealthiest quintiles in the first survey available for each of these 12 countries. Before the epidemic peaked, the majority

of the countries had a baseline fostering systems that conformed to the healthy pattern. That is, the probability of the wealthiest households fostering a child was significantly higher than that of the poorest households. In only one country do we observe the reverse pattern. In Namibia's 1992 survey, the poorest household had a 38 percent chance of fostering a child, while the wealthiest households had only a 23 percent chance. In two of the countries—Kenya and Niger—the probability of fostering a child among the wealthiest households was not statistically distinguishable from that of the poorest households.

Overall, these results suggest that before the AIDS epidemic it was often the case that wealthier households were more likely to foster children than their poorer counterparts. Deviations from this pattern as the AIDS epidemic escalated may indicate stress to fostering systems. I now turn to assessing evidence for such changes.

Table 4 Health of fostering systems before peak adult HIV prevalence (from countries for which survey were administered before the peak of the epidemic)

		Probability of fostering	
Country	Survey Year	Poorest Quintile	Wealthiest quintile
Healthy before peak			
Cameroon	1991	0.18 (0.15–0.20)	0.38 (0.34–0.42)
Chad	1997	0.18 (0.15–0.20)	0.38 (0.34–0.42)
Ghana	1993	0.12 (0.11–0.14)	0.17 (0.14–0.19)
Guinea	1999	0.22 (0.19–0.24)	0.39 (0.36–0.42)
Ivory Coast	1994	0.18 (0.16–0.20)	0.42 (0.38–0.45)
Malawi	1992	0.12 (0.10–0.15)	0.30 (0.27–0.33)
Mali	1996	0.13 (0.11–0.14)	0.25 (0.23–0.28)
Mozambique	1997	0.15 (0.12–0.19)	0.33 (0.28–0.37)
Nigeria	1990	0.14 (0.12–0.16)	0.21 (0.19–0.23)
Unhealthy before peak			
Namibia	1992	0.38 (0.35–0.42)	0.23 (0.20–0.26)
No significant distinction			
Kenya	1993	0.15 (0.13–0.17)	0.16 (0.15–0.18)
Niger	1998	0.19 (0.16–0.22)	0.23 (0.20–0.25)

95% confidence interval in parentheses

5.3.2 Changes in the patterns of fostering over the course of the epidemic

I use the definition of "healthy" and "unhealthy" fostering systems outlined above to categorize countries into four categories based on their patterns of fostering over time: (1) those with healthy fostering systems throughout the epidemic, (2) those that shift from healthy to less healthy systems, (3) those whose systems are unhealthy throughout the epidemic, and (4) those that have no distinguishable changes of fostering patterns because the likelihood of fostering was often not associated with household SES.[4] Table 5 summarizes the pattern category that each country falls into mapped onto the timing and prevalence-levels of the HIV epidemic. The patterns for each country over time are discussed in detail below.

Table 5 Categorization of countries by pattern of HIV Epidemic with corresponding pattern of fostering systems over time

		Prevalence			
		Low (<5%)	Pattern	High (>=5%)	Pattern
Peak	Early(<2000)	Burkina Faso	Healthy	Kenya	Unhealthy
		Ethiopia	N/A	Malawi	Healthy
		Madagascar	–	Rwanda	Healthy
		Mali	Healthy	Tanzania	Healthy
				Uganda	Shift
				Zambia	Healthy
				Zimbabwe	Unhealthy
	Late (>2000)	Chad	N/A	Cameroon	Shift
		Ghana	N/A	Ivory Coast	Healthy
		Guinea	Healthy	Mozambique	Healthy
		Niger	N/A	Namibia	Unhealthy
		Nigeria	Shift		

Healthy fostering systems

Half of the countries in the sample maintained a relatively healthy pattern of fostering throughout the epidemic, where the probability of fostering was positively associated with

[4]Out of the 20 countries analyzed in this study, only Madagascar revealed fostering patterns that did not fit in any of these four categories.

household wealth and remained significantly higher for the top quintile compared to the bottom quintile. Figure 2 shows the fostering patterns mapped to the HIV/AIDS epidemic for these countries, sub-divided into those that faced high prevalence epidemics (Panel A) and those that faced low-prevalence epidemics (Panel B).

From Figure 2 we see that the majority of these "healthy" countries experienced a serious epidemic, with adult prevalence peaking at 5 percent or higher (Panel A). While their remains a significant difference in the probabilities of fostering between the poorest and wealthiest quintiles for these countries, examining shifts in the probabilities of fostering among the middle quintiles reveals a more nuanced picture. For example, in the Ivory Coast, Mozambique, and Tanzania there are survey years where there is a small or insignificant distinction in the probabilities fostering between the 4th and 5th wealth quintiles. In Ivory Coast and Mozambique, this is observed after the peak of the epidemic, while in Tanzania this is observed at the peak prevalence levels.[5] Despite what appears to be faltering in these countries, in none of the countries in Figure 2 do we observe frank reversals in the patterns of fostering, which suggests that family networks were able to be leveraged fully despite the challenges of the AIDS epidemic.

In all of the countries in Figure 2, we also see that the overall probability that private households will foster has remained at comparable levels across all countries. A clear exception to this pattern is Rwanda, which experienced a sharp increase in the overall probability of private households fostering between the 1992 and 2000 survey. While this does correspond with the peak of Rwanda's HIV/AIDS epidemic, caution must be taken when interpreting this, as the increase in child fostering also follows the 1994 genocide. Nonetheless, the differential probabilities of fostering across socio-economic groups in 2000 and 2010 do correspond with a health system, suggesting that fostering systems are strong despite the various calamities that Rwanda endured.

[5]Because there were no surveys administered in Ivory Coast during the peak of the HIV epidemic, it is possible that the system faltered during the peak as well.

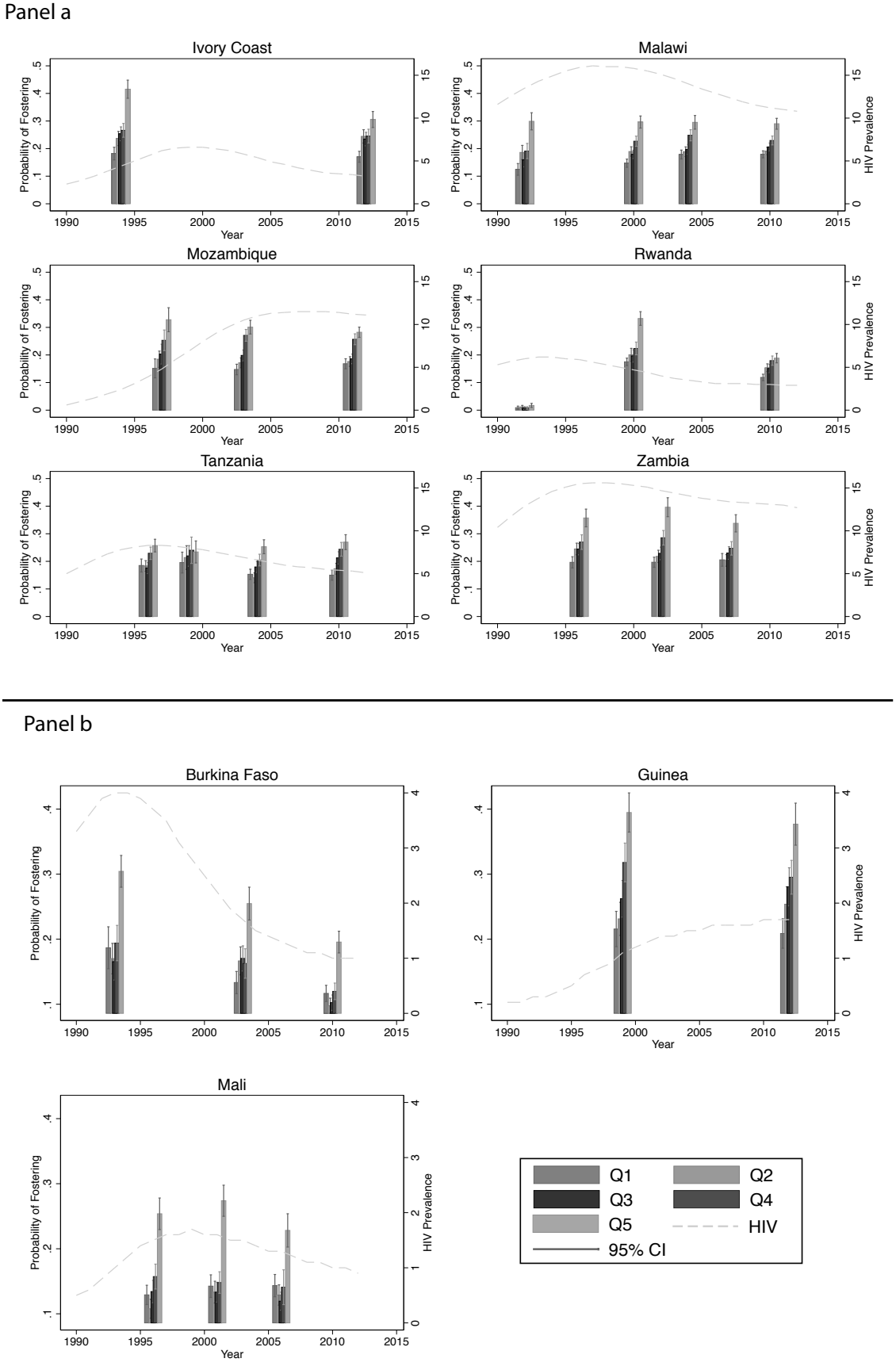

Fig. 2 Countries with "healthy" fostering patterns throughout epidemic

Shift from healthy to less healthy systems

Three of the 20 countries analyzed show distinct signs of stress to their fostering systems at later stages of the epidemic. Figure 3 contains the graphical results for Uganda, Cameroon, and Nigeria. In Uganda's 2011 survey, the probability of fostering is the highest among the 3rd and 4th wealth quintiles rather than the 5th. This pattern is a marked shift from three of Uganda's earlier surveys, where the wealthiest quintile had the distinctly highest probability of fostering a child. This shift happens after a protracted AIDS epidemic, when the HIV-prevalence rate plateaus at around 8%. Such pattern changes reveal some signs of stress to the fostering system. This is unsurprising given that Uganda experienced a high-prevalence epidemic, coupled with ongoing political unrest in the north, which displaced and orphaned many children in and of itself (Ntozi et al. 1999; Oleke et al. 2005).

The changes in the differential probabilities of fostering in Cameroon and Nigeria are different from the Uganda case. In both countries, at the onset of the HIV epidemic, the wealthiest households have, by far, the greatest probability of fostering relative to all other households. As the epidemic escalated, however, this ceased to be the case in Cameroon, which had a quintessential health pattern of fostering in its 1991 survey when the epidemic was low. In subsequent surveys in Cameroon, the probability of fostering for the wealthiest households became indistinguishable from all but the poorest households. In Nigeria, the probability of fostering was equally shared across all households in the 2003 survey. By 2008, the wealthiest households were, again, the most likely to foster, but the probability of *any* household fostering had dropped substantially compared with earlier stages of the epidemic, indicating a broader decline in family fostering.

Again, in none of these countries do we find a frank reversal of early fostering patterns. While the wealthiest households no longer stand out as having the highest probability of fostering relative to all other wealth quintiles, we do not observe an increase in the likelihood of fostering among poorest households either. Rather, there is merely a flattening of the differential patterns of fostering. While not ideal, these results do not indicate a absolute

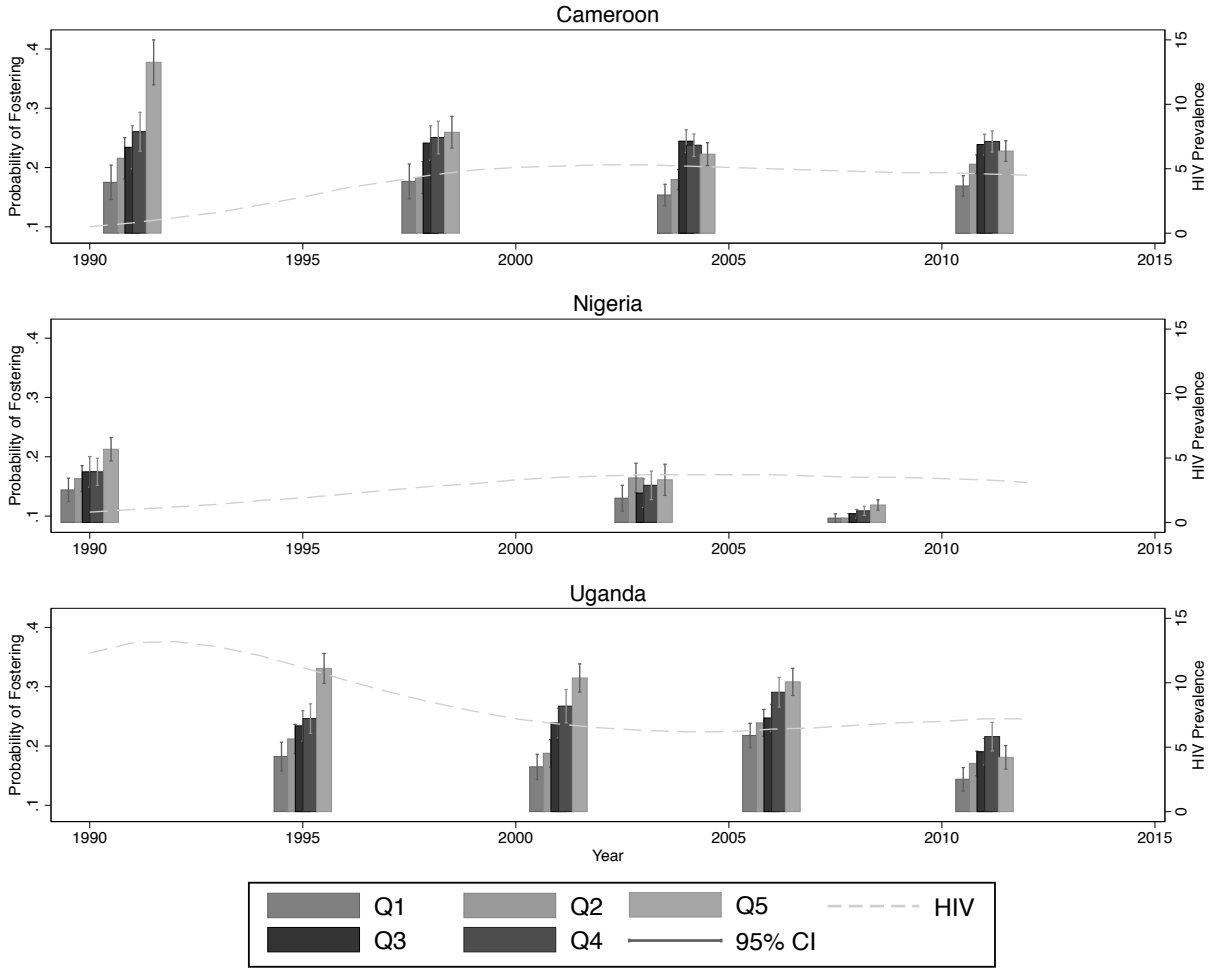

Fig. 3 Countries that show a shift from healthy to less healthy fostering patterns

fracturing of fostering systems.

Unhealthy fostering systems

Three countries stand out as failing to place children in wealthier homes throughout the epidemic. These include Kenya, Namibia, and Zimbabwe, and changes in their respective patterns are elaborated in Figure 4. Common across these three countries is that they have all experienced severe HIV/AIDS epidemics, with Namibia and Zimbabwe having the two highest adult-peak prevalences in this sample. Private households in Namibia and Zimbabwe are substantially more likely to foster a child relative to those in Kenya. However, in all three

countries the majority of the additional child-care responsibilities fall on households in the first and second wealth quintiles. In fact, patterns in the differential probabilities of fostering across socio-economic groups in both Namibia and Zimbabwe are the quintessential definition of unhealthy.

In Namibia this appears to be the pattern before the epidemic escalates, making it difficult to determine if wealthy households are not fostering as a result of AIDS or if placing children in poorer household is the normative practice in the country. However, the fact that HIV prevalence is so low in the country during the first survey in 1992 suggests that this pattern might be the norm for the country. At minimum, the AIDS epidemic did likely cause this "unhealthy" pattern of fostering in Namibia.

The relationship between AIDS and the unhealthy pattern of fostering is harder to determine in Zimbabwe because there the epidemic peaked early and the absolute prevalence levels were extremely high. During the 1994 survey (the first data point available), adult HIV prevalence was nearly at its peak. In this case, it would be ideal to have a survey from the mid-1980s to observe the fostering patterns across socio-economic groups before AIDS escalated. In the absence of this, the one thing that can be determined is that child fostering systems in Zimbabwe did not rally to a healthy patterns of fostering. Rather, it faltered throughout the epidemic.

Kenya stands apart from Namibia and Zimbabwe, in that we see more of a negative change in the pattern of fostering, rather than a persistent struggle to place children in wealthier households. In the 1993 and 1998 surveys, there was no statistically significant distinction in the probability of fostering among households in different wealth quintiles. However, in the 2003 survey—after the peak of the epidemic—households in the highest wealth quintile are significantly less likely to foster a child compared to all other households. This could be interpreted as a negative response to HIV/AIDS or it could be indicative of the wealthiest households becoming more disconnected and socially insulated from their poorer counterparts.

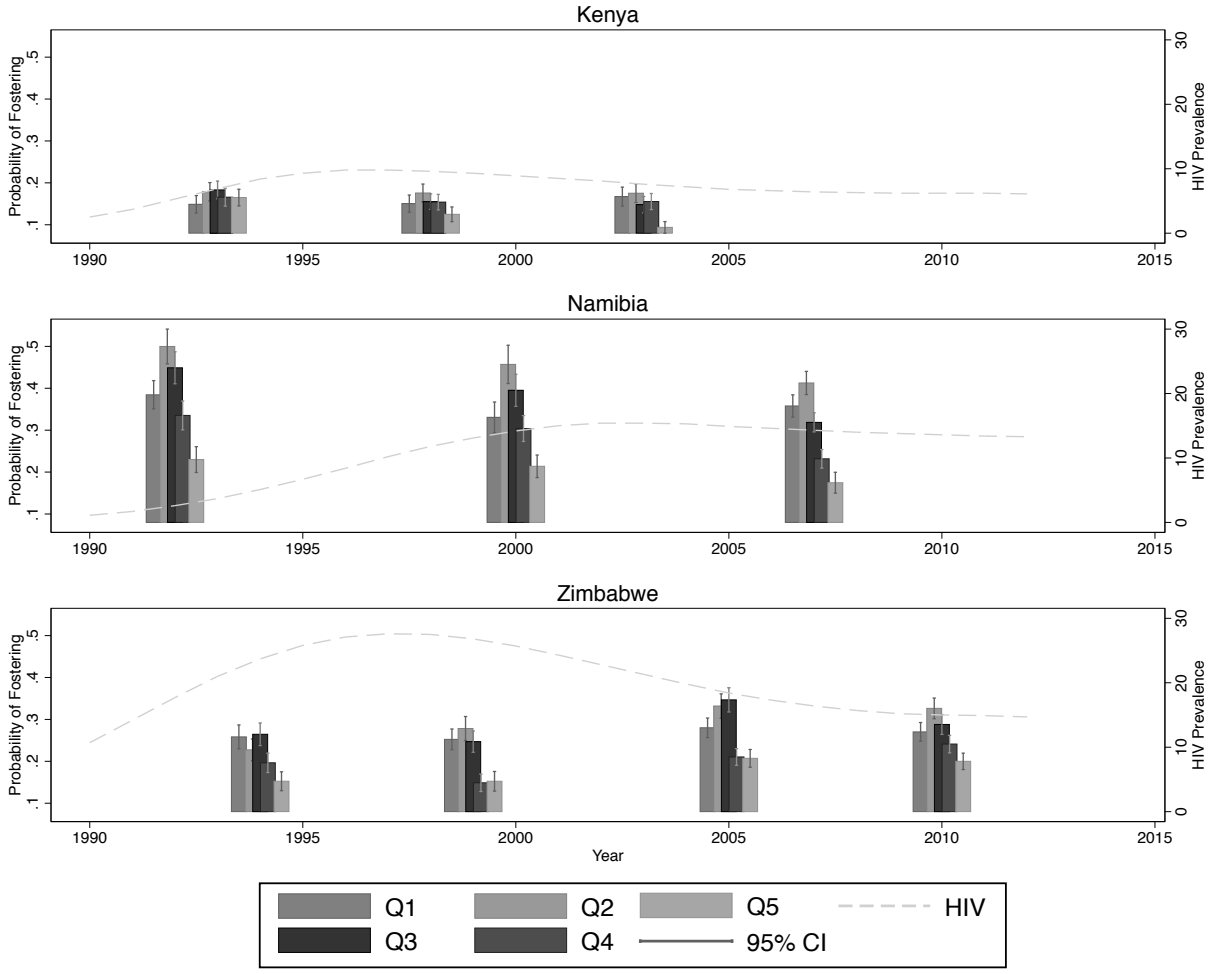

Fig. 4 Countries where fostering systems struggled throughout the epidemic

No distinguishable or detectable changes to fostering system

In four of the countries analyzed I find either no real changes in the probabilities of fostering among socio-economic groups over time or no significant distinction in the probabilities of fostering between socioeconomic groups.[6] These countries and their respective fostering patterns can be found in Figure 5. What these four countries have in common is relatively low levels of HIV. With the exception of Ethiopia, these are also West African Countries. Chad and Ethiopia stand out in having a clear distinction in the probabilities of fostering

[6]In the Ghana's 2003 and 2008 surveys and in Niger's 1998 and 2012 surveys, wealth was not statistically associated with the likelihood of hosting a foster child.

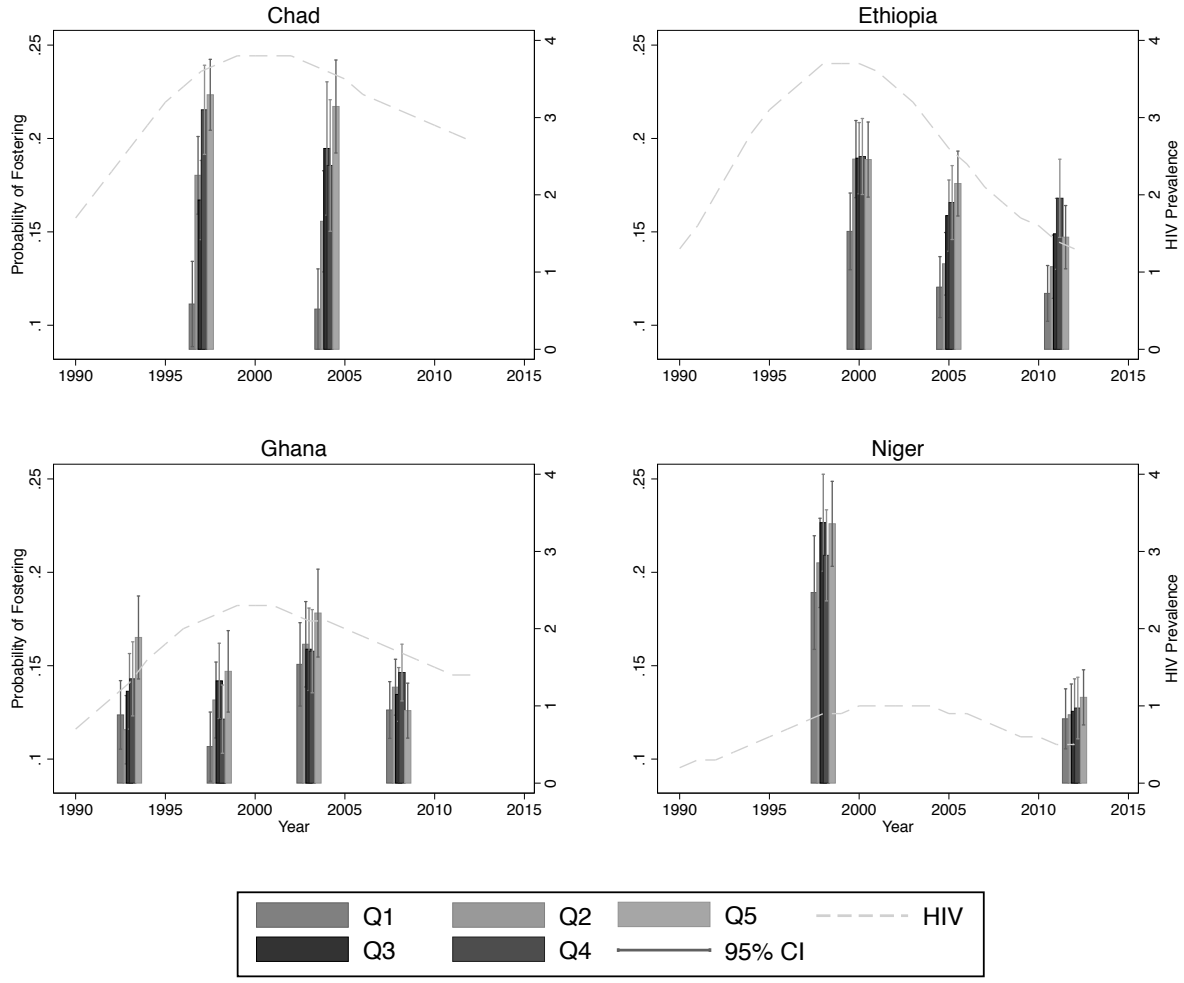

Fig. 5 Countries with ambiguous associations between fostering and SES groups

between the poorest and wealthiest quintiles. However, the extremely wide confidence intervals for the predicted probabilities of the other quintiles make these countries unlike the other "healthy" countries found in Figure 2.

6 Summary and Discussion

Child fostering is a social institution in sub-Saharan Africa that acts as a safety net and means of opportunities for children and families. Since the onset of the AIDS epidemic in

the region, scholars have been divided on whether the epidemic and ensuing "orphan crisis" was overwhelming families' ability to continue to care for foster children. This paper uses changes in foster child residence patterns across socioeconomic groups as a lever to evaluate if and how the institution of child fostering is being stressed across 20 countries in sub-Saharan Africa over a 23 year span of the AIDS epidemic. Rather than focusing on the living arrangements of orphans, this paper takes a holistic approach that acknowledges that households and families underpin child fostering systems and that fostering is a process that serves *both* orphans and non-orphans.

This study presents new findings that contribute to our understanding of how the institution of child fostering has weathered the AIDS epidemic. First, it establishes that many countries did, in fact, have a healthy pattern of fostering prior to the onset of the AIDS epidemic, something that has heretofore not been empirically established on a large scale. This study also demonstrates the remarkable resilience of families to foster children in the face of the AIDS epidemic. In nine of the 20 countries analyzed, overall healthy patterns of fostering were observed throughout the epidemic. And these were not just low-prevalence countries—six of these nine countries experienced a sever epidemic. In fact, over half of the 11 countries in the sample that experienced an adult prevalence rate of 5% or higher maintained their ability to continue to have the wealthiest households foster children. This suggesting that, overall, "healthy" patterns of fostering persist despite the increased childcare responsibilities.

Even where signs of stress are observed, such as in Uganda and Cameroon, there is no evidence of frank reversals from healthy to unhealthy systems. Among countries that showed signs of stress, the wealthiest households remain significantly more likely to foster compared to the poorest families. While it is unclear whether children were placed in these home or if the homes became wealthier because of fostering, we nonetheless see little change in the overall relationship between wealth quintiles and probability of fostering in the majority of the countries analyzed.

While the HIV/AIDS epidemic does not seem to overwhelmingly hurt fostering systems, countries with particularly high epidemics *do* struggle to selectively place foster children in wealthier households. In some cases data availability makes it difficult to tell if normative patterns of fostering in these countries were "unhealthy" before the epidemic began. However, what these results do allow us to say for certain is that, in the cases of Namibia and Zimbabwe, the poorest households had greater probabilities of fostering a child relative to wealthier households, which has a number of implications for policies directed at families and children in these countries.

The present study also confirms two things that have been demonstrated by smaller scale studies on child fostering. First, results of this study demonstrate the strong link between household wealth and fostering across a number of different sub-Saharan African countries. This supports previous research suggesting selective placement of foster children into relatively wealthier households (Beegle et al. 2010; Isiugo-Abanihe 1985) as well as research that suggests that households that foster may increase their wealth over time (Bachan 2014). Second, I find that most fostering occurs in high-prevalence countries, not in West African countries, which are traditionally cited as having the most robust fostering institutions. This confirms the work by McDaniel and Zulu (1996) and suggests that families high-prevalence countries have responded to the demand of additional child care responsibilities.

6.1 Future research and considerations

A number of data-related limitations were discussed above (see "Data considerations" subsection). In addition to these limitations, it was beyond the scope of this study to address what these patterns mean for fostered children in terms of the quality of the fostering experience. Previous literature on the relationship between child fostering and educational opportunities would lead us to believe that foster children in relatively wealthier households have greater access to opportunities for social mobility. However, residence in a relatively resource-poor household does not necessarily indicate that children lack educational opportu-

nities. For example, Parker and Short (2009) find that maternal orphans who are fostered by their grandmothers are just as likely to being in school as children living with their mothers.

This study takes a household-centered approach, which is largely appropriate for the study of child fostering systems, but is is also constrained by data availability. While households can serve as good proxies for families, the this study should ideally be replicated with data on family networks, which often extend beyond the household. Ethnographic work can help to illuminate shifts in family networks over the course of the AIDS epidemic, and more of that type of research is needed. This body of research would also benefit greatly from the increased collection of social network data, which could ideally be collected longitudinally.

While one strength of the present study is that it considers the fostering of *both* orphans and non-orphans, more research is needed to look at differential probabilities of fostering of both types of children. Grant and Yeatman (2012) take large steps in this direction and more work of this kind is needed to determine other ways in which fostering systems are changing. It is my hope that by demonstrating the overwhelming resiliency of child fostering systems as a whole, research on child fostering can begin to tackle other questions that matter for children and families.

It is not the goal of this paper to argue that the AIDS epidemic has not had a negative impact on families. Research in this area certainly confirms that it does. Nonetheless, by demonstrating that normative patterns of foster child residence across socio-economic groups has remained relatively stable, this research suggests that the institution of child fostering continues to be a safety net for children and families in many countries in the region.

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