INTRODUCTION

Research in the U.S. has highlighted that children living apart from their biological fathers are at greater risk of adverse outcomes regardless of race, education or mother's remarriage (Lamb, 2004; Amato, 2000; Cherlin, 1999; McLanahan and Sandefur, 1994). Such children tend to be poor and experience health problems (Horn and Sylvester, 2001); are more likely to have developmental, emotional or behavioral problems (Lamb, 2004; Dawson, 1991). In addition, these children are more likely than other children to have lower educational success (Lee, 1993; Zill, 1996; Lamb, 2004). Other studies have shown that adolescents living with both parents are also less likely to engage in delinquency like using drugs, and drinking alcohol (Carlson, 2006; Hoffmann and Johnson, 1998), and having a teenage pregnancy (King and Sobolewski, 2006). It is important, though, to note that the strongest effects of father absence have been found in behavioral problems.

Research has also investigated the mechanisms by which father absence affects children, with particular focus on loss of economic resources and parental time. This research suggests that non-resident fathers' high quality involvement tends to counteract the effects of absence from the household (Lamb, 2004; Amato and Gilbreth, 1999). In particular, Amato and Gilbreth (1999) found that frequency of contact by non-resident fathers was not related to child outcomes in general; rather, feelings of closeness and authoritative parenting were associated with better outcomes.[1] On the other hand, fathers' economic resources tend to play a much more important role for child well-being than father-child contact. In her study, King (1994) showed that father visitations were not statistically significant for any assessment of child well-being measures. Instead, the

[1] They reviewed 63 studies dealing with non-resident fathers and children's well-being.

study emphasized the importance of payment of child support for measures of schooling. These results were also support by Amato and Gilbreth (1999) meta analysis. In addition, child support does not only improve children's educational outcomes, but also children's health and well-being (McLanahan and Robins, 1994). From these studies, it could be argued that the effects of non-resident fathers are more evident in the domains that require financial resources. Thus, it is not absence per se; rather it is father-child relationship as well as resources that lead to differences in some child outcomes.

In Lesotho, like many parts of Southern Africa, father absence is prevalent and not a new phenomenon. The long history of child fostering coupled with male labor migration to South African mines has caused many children to spend most of their lives not co-resident with their fathers. For instance, in 1996, 60% of the male labor force had ever worked in South Africa (Makatjane, 1996), while recent statistics show that about 15% of the male labor force work in South Africa (BOS, 2003). However, absence here does not necessarily mean uninvolved. Rather, working in the mines is a major source of income for many rural households in this poor and high unemployment environment (Gustafsson and Makonnen, 1993). Townsend et al. (2002) in an investigation of South Africa, have shown that although children with both co-resident parents have higher levels of schooling on average than those with one or both parents not resident, having a father away from home does benefit some children. This suggests that in developing countries with high poverty and unemployment, and where the division of labor between men and women is quite prevalent, co-resident fathers might fail to provide for their children due to poverty, lack of employment, making fathers not co-resident better fathers (Engle, 1997). Therefore, reliance on father-child co-residence in understanding child

outcomes can undermine the important social connections that children have with their absent fathers.

This thesis extends understanding of the implications of fathers for child outcomes by explicitly taking into account the variety of connections between children and their fathers. In particular, it distinguishes between i) sharing household membership; and ii) co-residence. Making these distinctions I explore the relationship between type of father connection and child nutritional status. I look at nutritional status of children under five because malnutrition is reported to be the major cause of child morbidity and mortality in Lesotho (WHO, 2004), and has a direct link to the provider role that fathers in Lesotho continue to play.

> "Children who are undernourished have lower resistance to infection and are more likely to die from common childhood ailments such as diarrhea diseases and respiratory infections. In addition, those who survive may be locked into a vicious cycle of recurring sickness and faltering growth, often irreversible damage to their cognitive and social development" (UNICEF, 2006: 1).

According to UNICEF (2007), Lesotho under five mortality ranks 31 in the world, with an estimated 132 deaths per thousand live births in 2005. In the same period 20% of children below 5 years of age were underweight, with 4% wasting and 38% stunting (ibid). Because children's nutrition can be dependent on household resources and social connections, it is important to explore the relationship between children's living arrangements and nutritional status.

COUNTRY BACKGROUND

The Kingdom of Lesotho is a small landlocked country situated entirely within the borders of South Africa. As a result, the history and socio-economic development of the country has been intricately linked to that of its neighbor. The total population has been estimated at about 2.2 million, about 80% of which lives in rural areas (Bureau of Statistics, 2003). It is one of the world's poorest countries, ranking 145th on the Human Development Index (UNDP, 2005).

For over a century, the South African mines had been offering ready, lucrative and lifetime employment for many Basotho men. As indicated earlier, about 3 in 5 Basotho men reported to have ever been employed in the South African mines in 1996 (Makatjane, 1996). Currently, 1 in every 7 adult males is working in South Africa (BOS, 2003). Significantly many jobs in the mines do not require formal schooling. For this reason, women enjoy high rates of literacy rates estimated at 90% compared to 74% for men (BOS, 2003), and dominate the running of rural small holdings, which provide subsistence agriculture to the majority of the population. In urban centers, women account for 62% of the professional and technical positions in the formal sector (Kimaryo et al., 2004). Nonetheless, men still dominate higher administrative and managerial posts in government and private sector. This is due to high female drop out rates at late primary and secondary school levels, which result in fewer women than men attaining higher levels of education. At the same time, higher female literacy rates have not translated into higher employment rates. About 57% of the females relative to 31% of the males are unemployed (Bureau of Statistics, 2003). This situation reflects high

expectation of men to assume the breadwinning role, while the women take care of children – highlighting the persistent division of labor in the country.

Basotho are a homogeneous society and still very patriarchal, despite higher school enrollment for females, especially at primary school level. Based on the customary and common laws enshrined in the Constitution, the man is the head of the household and family, and the sole decision maker. However, with the absence of the men, many women have assumed the decision-making role, which has been reported to have empowered women in the country (Kimane et al., 1999). Male labor in the mines benefits the economy of Lesotho. Income from the mines is also an important source of livelihood for many families, especially rural families, in Lesotho.

Fathers who are migrants usually only come home upon retirement, when most of their children have grown into adulthood. The rest of the time, the labor migrants visit their families at the end of the month and during holidays. Little previous research has explored the types of relationships absent fathers have with their children, and how this might affect child outcomes. As indicated earlier, research in the U.S. highlight the importance of parental residence for better child outcomes. This is attributed to interaction, availability, moral guidance as well as financial support that fathers accord to their children when they co-reside with them (Lamb, 2004). If this model is imported to Lesotho, it would suggest that children who do not live with their fathers would be more likely to have adverse outcomes. However, unlike the U.S., residence with a father in Lesotho does not always imply economic support or involvement with children. In particular, some fathers fail to provide for their children due to poverty, lack of employment, or because they are spending resources on drugs and alcohol (Engle, 1997).

Although many children do not live with their fathers due labor migration in Lesotho, these children can benefit substantially from the remittances that their fathers send home. Remitting fathers tend to maintain household membership while absent. Thus co-residence per se might not be beneficial to children, rather father's membership to the household might be more important.

Alternatively, co-residence with fathers could be important. One possibility is that adult male presence offers social benefit. Given the strength of extended family ties and responsibilities in Lesotho, and other African settings, it is plausible that related co-resident adult men could provide as much benefit to a child as a father. Thus I explore whether child nutrition is associated with co-residence with a father. I also ask whether household membership confers advantage irrespective of co-residence. Finally, I explore whether any effects observed are due to father-child kin connection, or appear to be linked to co-residence with a related adult male.

HIV/AIDS and Children's Living Arrangements

Children's living arrangements with fathers in Lesotho are also very much affected by the HIV/AIDS epidemic. With an adult prevalence rate of about 25-30% (UNAIDS, 2005), more and more children are losing parents and caregivers to the epidemic. In the country, it is estimated that more than 15% of children below 15 years are currently orphaned (UNICEF, 2004). This figure is projected to increase and by 2010, about 1 in every 4 children would be orphaned. Paternal orphanhood is currently estimated at 22.8% (LDHS, 2004). With limited government support, a large majority of orphaned children are taken care of by surviving parents, siblings and extended family. Thus, following parental death, children are likely to move into new households; into

households that can provide for them (Ford and Hosegood, 2005). This suggests that HIV/AIDS has reinforced extended family living arrangements, making other members of kin important in understanding child well-being. These are households with other adult males who are likely to assume fatherly roles to children. This makes it worthy to explore the effect of co-residence with other male relatives on children's nutritional status.

RESEARCH QUESTIONS

Fatherhood literature stresses the importance of father-child co-residence for better child outcomes. In an environment where many children live most of their childhood without their fathers due to migration, child fosterage, and paternal death, it is important to understand i) whether this relationship holds; and ii) if it does, factors that diminish the negative effects of father absence on child outcomes. Specifically, this research aims at understanding the effects of non-co-residence with biological fathers on children's nutritional status, as well as the role that might be played by other adult male relatives co-resident with children on children's nutritional status. The following research questions are investigated:

1. Is household membership with father associated with children's nutritional status in Lesotho?
2. Is co-residence with other adult males associated with children's nutritional status, net of father presence?
3. Does the effect of presence of other males depend on presence of a father?

In order to address the above research questions, family resource explanations as well as socio-biological explanations are used in this research. In the following section, hypotheses and rationale for the research questions are presented.

1. Is household membership with father associated with children's nutritional status in Lesotho?

Contrary to literature in the US, this research hypothesizes that children with non-co-resident fathers who are household members are likely to have better nutritional status than children with fathers in Lesotho. Many studies have argued that not sharing a residence with children makes it difficult for men to enact the parental role (King and Sobolewski, 2006; Lamb, 2004; Amato and Gilbreth, 1999; McLanahan and Sandefur, 1994; Dawson, 1991). There are two social-biological explanations to support these arguments. First, Becker (1981) argues that biological parents are more altruistic towards their children than anyone else. If the fundamental function of the family is to reproduce and ensure biological continuity, this perspective suggests that parents have a stronger incentive to invest time, energy, money, and other resources in their children. This arguments has been supported by other research that has shown that relative to biological fathers, step-fathers spent less time with children (Cooksey and Fondell, 1996), while other research shows that step-fathers provide less support and discipline than biological fathers (Amato, 1987). In sub-Saharan Africa, it has been argued that children living in households headed by their parents fare better than fostered children and children living in households headed by other relatives (Shapiro and Tambashe, 2001, Case et al., 2004; Nyamukapa and Gregson, 2005). It could therefore be argued that non-parentals living with children are likely not to invest enough on children's nutrition.

Drawing on the social capital theory, the density of social relations within the family and between the family and outside institutions and individuals may affect how well the familial resources are transmitted to the children (Coleman, 1990). Since social capital is facilitated in closed systems, where each member of the system is linked to other members, then in line with Becker's argument, social capital is inherent in the parent-child relationship, and co-residence serves as an important proxy for this resource transfer for the child. In particular, fathers are even more important in this regard in a patriarchal society like Lesotho where the children follow the father's identity. Father-child co-residence as the transfer of social capital between fathers and children can be measured by both the quality and quantity of involvement (Amato and Gilbreth, 1999). For instance, early research on nonresident fathers was often predicated on the assumption that frequency of father-child contact benefits children (King and Heard, 1999). However, current research emphasis the quality of that relationship (Amato and Gilbreth, 1999).

At the same time, quality of the father-child relationship is determined by social norms prevailing in a society of what it means to be a good father (LaRossa, 1988). A good father in Lesotho is one who can provide for his children. With high unemployment and poverty, many fathers are forced to leave their families in search of employment opportunities in neighboring South Africa. These men leave their families for long periods of time, only visiting seasonally (see Murray, 1981 and Ramphele, 1993). Nonetheless, absence in this case does not mean lack if involvement. These men remain household members, and sometimes household heads of their families. Spiegel (1996) calls this relationship "stretched" households since a household is not necessarily defined

by co-residence, but rather social connections of members across space (also see Townsend et al., 2006). In this sense, using father-child co-residence as a proxy for father presence or involvement is very limited. Rather, household membership can be used as a better proxy for father connection to the child. When the father is reported as a household member, yet absent, there is commitment of resources in the form of remittances and other investments that the child benefits from. *I expect that compared to a child with a co-resident father, a child with a father who is a household member but not co-resident will on average have better nutritional status, net of other factors.*

2. Is co-residence with other adult males associated with children's nutritional status?

While concerns about the role of social fathers have long been raised in family research, there has been limited documentation. Current research often measures the role of step-fathers on child outcomes. For instance, research in the US has indicated inconsistent effects of step-fathers on children. In particular, child sexual abuse has been reported in step families (Margolin and Craft, 1989), while recent research indicates warm relations between children and their step-father (Goldscheider and Rogers, 2001). The important question that this research should pose is whether it is absence of a father (biological father) per se or absence of a second parent that affects child outcomes? Lamb and Tamis-Lemonda (2004) argue that father absence maybe harmful not because a male sex role model is absent, but because many paternal roles, economic, social and emotional, go unfulfilled. In line with this argument, it is reasonable to expect that uncles, grandfathers, brothers, and other male cousins, to the extent that they fulfill some

of the roles, could be important to children's outcomes. This research explores this possibility.

With high child fostering and parental death due to HIV/AIDS in Lesotho, the role of other men in children's lives is very important to understand. In particular, kinship networks in sub-Saharan Africa have been reported to buffer the effects of household shocks. For instance, Desai (1992) has shown the importance of extended household living arrangements on child nutrition. In particular, it has been shown that extended family networks in sub-Saharan Africa can benefit children through resource pooling (Desai, 1992; Kiros and Kertzer, 2000). Foster (2000) indicated similar schooling outcomes for orphans and non-orphans in this region. This is because orphaned children are absorbed into households with adults who assume parental responsibilities. In line with this, Akresh (2005) also showed that young fostered children were 18% more likely to enroll in school than their host and biological siblings in Burkina Faso. What could be happening here is that fostered children are getting additional resources from many more adults who are assuming parental responsibility to them. These are resources from own biological parents and the foster parents.

In addition, children living with closer relatives showed better survival rates in Uganda (Bashai et al., 2003). Thus the relationship of the child to the adult men in the household is also very important. For instance, Townsend (1997) used ethnographic research in Botswana to show the importance of grandfathers and maternal uncles to children of single mothers. Similar findings were also observed in South Africa, where children with social connections to their maternal uncles were more likely to have better educational outcomes (Townsend et al., 2002). Similar to previous studies on sub-

Saharan Africa (see Lloyd and Blanc, 1996), this study also found that female headed households were associated with better educational outcomes for children. While this could be used to support the notion that women invest more on children, it could also be used to reflect the role of other male relatives connected to that household. However, like co-resident fathers, in a high poverty and unemployment context, co-resident adult male relatives are likely not to be working, thus adding strain on the household resources. *The hypothesis is that children living with co-resident male relatives will have on average worse nutritional status, net of other factors.*

3. Does the effect of presence of other males on children's nutritional status depend on presence of a father?

Household composition is important in understanding the links between children's living arrangements with particular individuals and child outcomes (Townsend et al., 2002). Using data from 24 countries in sub-Saharan Africa, Zimmer and Dayton (2005) found that men are more likely to live in nuclear families than women. This suggests that it is possible that father absence in a household is associated with presence of other extended male kin. For instance, in Lesotho, children of single and divorced mothers are likely to live with mother's family (example grandfather and uncles). Thus the relationship of children's living arrangements with their fathers and nutritional status could be confounded by their living arrangements with other men. Households with other adult men and no father would suggest that the adult men are substituting the father's role, while households with both the father and other adult men would suggest supplementary role of these men on children's nutritional status. Townsend and colleagues (2002) have shown that children living in three-generational households in

South Africa have better educational outcomes than those living in nuclear households. Another study in Uganda also showed that these children have better behavioral and psychological outcomes (Alwad and Sonuga-barke, 1992). However, the resources that these adults bring to the household are important. Desai (1993) showed that children living in poor households with many adults have lower nutritional status due to extra pressure on the resources. *I expect that children co-residing with both a father and other adult males will on average have lower nutritional status than other children.*

DATA

Data and Sampling Frame

This research uses data from 2004 Lesotho Demographic and Health Survey (LDHS) conducted by the ORC Macro International in collaboration with the Bureau of Statistics and Ministry of Health and Social Welfare (ORC Macro, 2006). A two-stage sample designed was employed where 405 clusters, 109 in urban and 296 in rural areas, were selected from the 1996 population census frame enumeration areas list, and then systematic households were selected from each cluster.

Women aged 15-19 reported on the household roster who were reported as either permanent residents or visitors present in the household on the night before the survey were eligible to be interviewed. Another interesting characteristic of these is that a sub-sample of men aged 15-59 years was also selected. These were men in every second household selected for the survey who were either permanent residents or visitors present in the household the night before the survey. In these 4, 863 households selected for men's survey a sub-sample was interviewed with information on height and weight measurements taken for eligible women and children under 5 years.

The household questionnaire helped to identify eligible members, while also recording basic information about other household members and housing characteristics. This questionnaire was also used to record height and weight for eligible women and children in the household selected for men interviews. Height and weight were obtained from children born in the five years before the 2004. The children in this analysis are all children who stayed in the household the night before the interview. The overall quality of the survey was very good. Response rate for the households selected for height and weight measurement was reported at 94.6%, with a slightly lower response rate in urban areas of 88.3% (ORC Macro, 2006).

SAMPLE

Data on child nutritional status was collected for children aged 0 to 59 months in households selected for men's survey. This sample represents only children coresiding with their mothers. This is not a true reflection of children's living arrangements in Lesotho since many children do not live with their mothers due to maternal death, labour migration and child fosterage practices. However, for data collection purposes, presence of mothers was important to solicit correct information about prenatal and postnatal practices. At the same time, at younger ages the likelihood of living with a mother is higher than at older ages (Ansell and Van Blerk, 2004). About 88% of children aged 0 to 4 years co-reside with their mothers in Lesotho (LDHS, 2004). It should be noted that in the current research sample 98% of the mothers reported to be usual residents while 2% were non-usual residents, though household members, who happened to be available at the time of the survey interview. This yielded a total of 1, 363 children aged 0 to 60 months with complete living arrangements information for this analysis.

MEASURES

Dependent Variables

This research uses three anthropometric indices to understand the impact of father-child co-residence on children's nutritional status in Lesotho. Anthropometry provides one of the most important indicators of children's nutritional status. Anthropometric measures such as height and weight have been commonly collected and used in surveys to assess children's nutritional status. These measures reflect sources of nutritional determinants since body measurements are sensitive to a full range of factors (Cogill, 2003). The measures also reflect past, present and future health risks of children (WHO, 1995). The measures are standardised based on children's age and sex using a reference group set up by World Health Organisation (WHO) and the National Centre for Health Statistics (NCHS). This yields three standard nutritional status indices: weight-for-height, height-for-age and weight-for-age. These indices are used to reflect wasting, stunting, and underweight which are employed to assess determinants of children's nutritional status in Lesotho.

1. Weight-for-Height (Wasting)

Since the 2004 LDHS only collected information on current living arrangements of children with their fathers, wasting is an important indicator of current nutritional status since it measures short term effects of changes in food availability. Standard deviations of weight-for-height (wasting) were readily available from the survey. This is a dichotomous variable where children with 2 standard deviations of weight-for-height below the mean are considered malnourished (wasted).

2. Height-for-Age (Stunting)

Similar to the wasting measure, standard deviations of height-for-age were readily available in the survey. Height-for-age is an indicator of long-term chronic malnutrition, it captures the effects of long-term living arrangements of children. The long time tradition of labour migration subjects children to long term non-co-residence with the fathers who do migrate. It is therefore pertinent for this research to evaluate the long term effects of father absence, though household member, on young children's nutritional status. This is also a dichotomous variable where a child whose height-for-age is 2 standard deviations below the mean is considered stunted.

3. Weight-for-Age (Underweight)

If a child's weight with regard to his age is 2 standard deviations below the mean, he is considered as underweight. Underweight reflects stunting and wasting together. For instance, if a child is stunted, he will weigh less than other children of his age even if the child is not wasted. Thus underweight reflects long-term or past malnutrition (the cause of stunting) as well as short term and current malnutrition (the cause of wasting).

Independent Variables

Living Arrangements with Father

Living arrangements with father is the main variable of interest in this research. Information on the survival status of the father was recorded for every individual on the household roster. The question was "Is member's father alive?" There were three responses to this question: "Yes", "No", and "Don't know". All children who reported "No" to this question were classified as 1) "*Father deceased*". Those who reported "Don't know" were assumed to still have a father alive because the death of their father per se would not have an effect on them.

For the children who were reported as father alive, living arrangements with the father were established. If a father was on the household roster, a line number was required for all young children in the study. Thus, if a child shares the same household with the father, then the father's line number on the roster would be recorded. If there was no line number recorded, then living arrangements with father was classified as 2) "*Father not in household*". However, due to high labour migration, especially for men, children might share a household with their father without being co-resident with them. Thus, current residency status of the father was established for children whose fathers were on the household roster. The question on current residency was "Does member usually live here, or elsewhere in Lesotho, or outside Lesotho?" If the residence status of the father was recorded as "usual resident", then living arrangements with father was classified as 3) "*Father Co-resident*". If the residency status of the father was recorded as "elsewhere in Lesotho" or "elsewhere outside Lesotho" then living arrangements with father were classified as 4) "*Father Household Member but Absent*". To further account for long term father absence, a question on "How long has member been away?" was used. I therefore used this question together with children's age to find whether the child has ever lived with their father. This led to the break up of *"Father Household Member but Absent"* into two variables 4 i) *"Father Absent for some time"* and 4 ii) "*Father Absent Since Birth"*. This yields a total of five categories of living arrangements with fathers.

<u>Living arrangements with other Adult Men</u>

Given the prevalence of non-child-father co-residence in Lesotho, the role of other adult men co-resident with the children is also established. These adult men are

classified as "grandfather" and "uncles/adult brothers". If a child was recorded as grandchild or great-grandchild to the head when the head is male, then it was certain that a grandfather was present in the household roster. For other children, then relationship to the head of the household was compared with their relationship of the other household members to the head. If the children's mothers were recorded as daughters/daughters-in-law to the head when the head is male, then the grandfather was present. If the mother was recorded as grandchild to a male head, then the child lived with the great-grandfather. If mother was head, and a male reported to be parent/parent-in-law to the head, then grandfather was classified as present. No assumptions were made about other relatives, and adopted and fostered children, or children who are not related to the head as these were only 5% of the cases.

To account for presence of other adult male relatives, adult brother was anyone reported on the household roster as sibling to the child and was above 20 years[2]. Similarly, uncle or older cousin was anyone whose relationship to the child was other male relative who was aged more than 20 years.

Child age and sex

Previous studies have found that very young children are less undernourished partly because of breastfeeding effect (Pongou et al, 2006). In line with this finding, Desai (1995) found that the difference between mean height-for-age for children under one year is small, but also increases with age, and peaks between age 2 and 3. However, the age effect on nutrition may interact with sex. Research identifying age-specific factors related to stunting of children from birth to 24 months of age shows that male

[2] Age 20 was an arbitrary number. However, it assumes that siblings who are at least 20 years older areno longer considered children, and therefore could assume adult roles in relationship to the young children.

children are more likely to be stunted in the first year, whereas females are more so in the second year of life (Adair and Guilkey, 1997). However, major sex differences in malnutrition are observed in countries with sex preference (Choudhury and Bhuiya, 1993) while in sub-Saharan Africa girls' anthropometrical status tends to be at par or even better than that of boys (Svedberg, 1990). Children's ages are divided into 6 categories as follow: 0-6months, 7-12 months, 13-24months (1 year), 25-36months (2 years), 37-48months (3 years), 49-59 months (4 years).

Mother's Characteristics

Mother's age, education, marital status and height-for-age of the mother were used as controls in this analysis.

Mother's Age

Mother's age measures their personal maturity in terms of child care. In addition, DHS surveys conducted in Burkina Faso, Ghana, Malawi, Namibia, Niger, Senegal and Zambia show that a greater proportion of mothers aged 15-19 and 40-49 are most affected by undernutrition, and this is closely related to their own children's nutritional status (Teller and Yimar, 2000). As such, it is important to control for mother's age in this analysis. The age of the mother is classified into four categories, "15-19", "20-29", "30-39"" and "40-49".

Mother's Education

Education is one of the most important resources that enable women to provide appropriate care for their children, and this is an important determinant of children's growth and development (Engle and Menon, 1996). Thus an increase in the level of mother's education is associated with lower incidences of malnutrition among young

children (Yimer, 2000). In this analysis, this variable was classified into three categories: "No education and some primary", "complete primary", and "secondary to higher education".

Mother's Marital Status

Mother's marital status is associated with household headship, and other social and economic status of the women that affect children's nutritional status. Compared to children of married mothers, malnutrition is higher among children of single and divorced/separated mothers in Ethiopia (Teller and Yimar, 2000). In this analysis, marital status is classified into 4 groups "never married", "currently married", "separated, divorced", and "widowed".

Mother's nutritional status

Mother's own nutritional status is important to account for when analyzing children's nutritional status. For instance, perinatal and neonatal mortality, risks of low birth weight babies, stillbirths, and miscarriages are some of the consequences of malnutrition in women (Krasovec and Anderson, 1991). Mother's height-for-age is often used as an indicator of her own nutritional status as well as genetic build and is positively associated with the nutritional status of her young children. This measure is used as a control in this analysis.

Household Characteristics

Other important household characteristics include: number of children and household wealth. The number of children in the household is typically inversely associated with child health. The mechanism for this effect is that higher number of children exerts pressure on the limited family resources (Montgomery and Lloyd, 1996).

Desai (1992) showed that compared to Latin America, sibling size did not affect children's nutritional status in sub-Saharan Africa because this effect is mediated by extended living arrangements. Many children in sub-Saharan Africa live with other children who are not their siblings. Therefore, these children do not necessarily have to compete for resources with their siblings who are not residents, but with the resident children in the household. In addition, the age of the children also matters in competition for resources. Older children may be an important resource for younger children in terms of child care and contribution to household economics. For instance, Horton (1988) showed that in Philippines the youngest children in large families benefit from older siblings through their financial contributions to household or child care. This suggests that composition of the children may play an important role than the number of the children in the household. It has been shown that siblings under 5 years of age have a negative impact on the children's height-for-age in India (Desai, 1995) and Ethiopia (Kinfu, 1999). In this analysis, the number of young children is defined as the total of all individuals on the household roster who are under 5 years of age.

Household Wealth

The economic status of a household is an indicator of access to adequate food supplies, use of health services, availability of improved water sources, and sanitation facilities, which are prime determinants of child nutritional status (UNICEF, 2006). The 2004 LDHS classified household wealth into 5 relative categories: "poorest", "poorer", "middle", "richer" and "richest", and these are used in the analysis.

Urban/Rural Residency

Due to limited sample size, the research only uses urban and rural residency to account for ecological variations. Urban and rural residency is important because of differences in economic and health resources access. In particular, people in urban areas have more access to health services due to availability of health clinics, pharmacies, and hospitals than rural areas, which are only often linked to health centers in the nearest urban area. Thus higher malnutrition rates are often observed rural areas (Teller and Yimar, 2000).

METHODS OF ANALYSIS – Logistic Regression Models[3]

This research employs logistic regression models because the outcome variables are dichotomous. The models determine the odds of being wasted, stunted and underweight when a child co-resides with a biological father and other men, controlling for other confounding factors for young children living with their mothers in Lesotho. The general estimated equation for the model is as follows:

$$\ln(p/1-p) = \beta_0 + \Sigma\beta_i X_i + e_i$$

Where,

p is the probability of a child being wasted, stunted or underweight

β_0 is the intercept

β_i are the estimated coefficients representing the odds of being wasted, stunted or underweight for individual predictor variables

[3] I also explored Poisson regression models to capture the effects on rare events such as wasting and the results were similar to logistic regression models.

X_i are the predictor variables (with focus on co-residence with father and other adult men)

RESULTS

In the following section I present descriptive statistics and regression of child nutrition on child connections to fathers and adult males.

Descriptive Statistics

Table 1 presents the nutritional status of young children living with mothers in Lesotho. The prevalence of wasting as a measure of short-term malnutrition is low, with only 4% of children under 5 years wasted relative to 9% in sub-Saharan Africa as whole (UNICEF, 2006). However, for long term malnutrition measure, stunting prevalence is about 38%. This prevalence rate is similar to the sub-Saharan rate (UNICEF, 2006). A combination of long term and short term effects on children's nutritional status shows that 20% of children in Lesotho are underweight, which is much lower than the regional rate of 28% (UNICEF, 2006).[4]

Nutrition is very closely related to resources that households can command to feed children as well as protecting them from diseases. In Lesotho, the poverty rate of less than US$1 is estimated at 49.1% (World Bank, 2007). Table 2 shows that children 0-4 are disproportionately represented in poorer households.

Mothers' characteristics varied in this sample. About 8% of the young children's mothers were teenagers aged 15-19 years (see table 2). This shows high teenage childbearing in the country. Only 4% of the mothers reported to have no education. As indicated earlier, this is very low by sub-Saharan standards. Thirty six percent of the

[4] All the nutritional status of children living with their mother Lesotho were similar to the ones estimated for the country as a whole (UNICEF, 2006).

mothers had some primary education, while only 30% reported to have only completed primary school. Higher educational attainment was low, with only 31% of the women having secondary and higher education.

As seen in table 2, a majority (77%) of the children in this analysis had married mothers. Never married mothers were reported at 10%, while widowed, and separated or divorced were 7% and 5% respectively. Since marriage is still universal in Lesotho, the never married mothers were mainly young mothers. At the same time, the high widowhood shows high paternal mortality reported at 9% for these young children living with mothers.

Some 42% of children aged 0-4 co-resided with a father. Nonetheless, 22% of the children shared a common household membership with a father, but did not co-reside with him. Among these children, 12% had their fathers absent for part of their lives, while some 9% had never co-resided with their fathers at all. At the same time, as high as 36% of young children in the study were not sharing household membership with their fathers. About 9% were orphans. Other children might not share household membership with a father because of mother not married to father, marital disruption or other factors.

Figure 1 shows patterns of living arrangements with father by age of child. Many infants (37%) did not live with their fathers. These are children who are likely to be temporarily living in their mothers' natal home according to Sesotho custom of giving birth in the natal home. This practice is used assist new mothers with babies as well as to facilitate postpartum abstinence (Kimane et al., 1999). In line with this practice, it can be seen that not sharing household membership with biological father decreases with child's age, while sharing of common household membership and co-residence tends to increase

with age for these young children (see Figure 1). As expected, paternal orphanhood increases with age, where 7% of infants have lost a father compared to 13% of 4 year olds.

Figure 2 shows that infants are less likely to be malnourished than older children. This is likely due to the important role of breastfeeding in securing both nutrition and disease immunity at early life (Pongou et al, 2006). Although breastfeeding period is estimated at an average of 21 months in Lesotho (Mturi and Hlabana, 1999), once supplementation and weaning begin, sharp increases in malnutrition are observed after infancy, especially for stunting and underweight. This may be because many families tend to depend on breast milk even when it is not sufficient. Desai (1995) found that the difference between mean height-for-age for children under one year is small, but also increases with age, and peaks between age 2 and 3. Thus, older children are especially at higher risk of malnutrition.

Looking at children's nutritional status and co-residence with fathers in figure 3, children with absent fathers since birth, though household members, tend to be twice as likely to be wasted as all other children in the sample. At the same time these children have the least long term effects of malnutrition (stunting). This is interesting because it suggests that there is something about father-child living arrangements and short-term versus long term effects on malnutrition. Since labor migration is a long term phenomenon in Lesotho, this could suggest that absence of a father from the household causes short term shocks on children who later enjoy long term remittances home that benefit their nutritional status. Moreover, paternal orphans have a low risk of wasting but the highest risk of stunting. In addition, 40% of children with co-resident fathers are

stunted, while 23% are underweight. Thus, co-residence with a father does not protect children from malnutrition in this setting.

Multivariate Results

In the following section, I explore the relationship between of co-residence with father and other men and nutritional status of children living with mothers in Lesotho. Tables 3, 4 and 5 show the odds ratios of being wasted, stunted and under weight for young children. I explore nested models and in each case, I explore an additive and interactive model, with interactions for living arrangements with father and other male relatives. I assess model fit with Chi-square test ($p< 0.05$). The preferred specification for wasting and stunting is additive. I only present the preferred specification for these models. I also present both the additive and interactive models for underweight.

Table 3 shows the results for wasting. The results suggest that co-residence with fathers and other men have no significant effect on young children's risk of wasting in Lesotho. Rather the model shows that mother's educational status is the only important variable in this analysis. Here, children co-residing with mothers who have finished primary school or have secondary and higher education tend to be 0.54 and 0.45, respectively, times as likely to be wasted as children who live with mothers with no education or some primary education. This suggests that the higher the mother's education, the less likely a child living with a mother would suffer from short-term malnutrition in Lesotho. However, Desai and Alva (1998) have cautioned that when interpreting educational effects on children's nutritional status, one should be aware that anthropometric measures are available for surviving children only. Thus, because maternal education affects children's survival probability, the sampling of living children

overrepresents children of educated mothers. Consequently, the effect of maternal education is likely to be slightly underestimated.

Table 4 assesses the association between stunting and co-residence with father and other men for young children living with mothers in Lesotho. Contrary to US studies that emphasize the importance of paternal co-residence, children whose fathers have been away since birth tend to fare better than children who co-reside with fathers in Lesotho. Net of other factors, these children are 0.62 times as likely to be stunted as children who co-reside with fathers. This suggests that there is something about these long term absent fathers that is positive to children's long term nutritional status. Although I do not have direct evidence, I speculate that long term these may be migrant fathers remitting home to the children. I expect co-resident fathers are more likely to be unemployed. However, there was no statistically significant difference in the risk of stunting between children who co-reside with fathers and children whose fathers have been away for some part of their lives. There is some indication that fathers who are absent for a long time have a more positive effect on children's long term nutritional status.

In addition, the effect of co-residence with other men on children's likelihood of stunting is significant. The results demonstrate that co-residence with grandfather, uncles or adult brothers is associated with 1.38 times higher likelihood of stunting compared to not co-residing with these men. This indicates that children's nutrition status is better off without these adult men in the household. It is unclear whether factors that lead to these living arrangements or the living arrangements themselves account for this result.

The results further show that children's age is an important predictor of stunting where relative to infants aged 0 to 6 months, older children are more likely to be stunted,

and this effect increases with children's age. For instance, compared to infants aged 0 to 6 months, infants aged 7 to 12 months are twice as likely to be stunted, while children aged 49 to 59 months are 7 times more likely to be stunted. These results are in support of previous finding that dependency on breast feeding at early life is not affected by socio-economic and environmental status (Pongou et al., 2006). Hence young children who are likely to be intensely breastfeeding are likely to have better nutritional status than older children who are dependent on other food supplements.

Education also plays an important role in children's risk of stunting. This is especially important for children of mothers with secondary and higher education whom relative to having a mother with no education or some primary education, these children are 0.80 times as likely to be stunted. Again, as expected mother's own genetic and nutritional status is significantly related to a child's long term nutritional status. A unit increase in mother's log percentile height-for-age is associated with 0.24 less probability of stunting among children living with their mothers in Lesotho. However, mother's marital status, children's gender and urban residency do not seem to statistically predict stunting in this analysis. The lack of statistically significant effect of urban residency is particularly contrary to previous results which show that children living in rural areas are at a higher risk of stunting than children in urban areas (Yimer, 2000). Relative to children living in the poorest households in Lesotho, children living in richer households tend to be significantly less likely to be stunted, net of other factors in the model.

I further explored whether the effect of co-residence with the father on nutritional status is mediated by presence of other adult males in the household. Adding the set of

interactions did not significantly improve model fit; hence the interactive specification is not presented here.

Table 5 explores the effect of children's co-residence with fathers and other men on underweight. The table presents both additive and interactive models. The additive model shows that compared to children co-residing with their fathers, children sharing household membership with fathers who have been away since birth tend to have a lower risk of underweight. It is also interesting that children with deceased fathers also have a lower risk of underweight compared to children with co-resident fathers. These results are puzzling because it is not clear who could be taking care of these orphaned children other than the co-resident mothers. Although, Nyamukapa and Gregson (2005) have shown that paternal orphans are less disadvantaged than maternal orphans due to differences in gender roles of who cares for the children, it is not clear from the current analysis why these orphans are better off than children co-residing with both living parents. Could it be that co-resident mothers work harder when the father is dead or there are other extra resources accorded to the family in case of paternal loss? These results suggest future exploration of household dynamics in the case of paternal death.

Co-residence with either a grandfather or other adult men has a significant effect on children's risk of underweight. Holding all other factors in the model constant, compared to children with no co-resident grandfather, uncle or adult brother, children co-resident with any of these men are 1.47 times more likely to be underweight. This supports the argument that in this setting, co-residence with men is generally disadvantageous for children's nutritional status.

Some controls in the model showed significant relationship with the risk of underweight. Similar to the model on stunting, children's age is associated with underweight. Compared to infants aged 0 to 6 months, children aged 7 to 12 months are almost 5 times more likely to be underweight, while children aged 49 to 59 months are 13 times more likely to be underweight. This indicates that the risk of underweight increases with age for these young children living with mothers in Lesotho.

Mother's education is also important in predicting young children's risk of underweight in Lesotho. For instance, relative to having a mother with no education or some primary education, having a mother with secondary or higher education is associated with 0.71 times likelihood of underweight. This is in line with the notion that educated women have more access to food and services that are beneficial for child nutrition. Moreover, mother's own genetic and nutritional status is a highly significant predictor of children's risk of underweight. A unit increase in mother's log percentile height-for-age is associated with 0.79 times likelihood of underweight.

Number of young children in the household and household wealth also matter. More children in the household are associated with higher risk of underweight. This finding is consistent with previous research that malnutrition is generally aggravated in families with many children because of the low per capita availability of food and other resources (Ahmed, 1991). Desai (1995) also adds that young children compete for similar resources hence the more young children in the household, the higher the risk of malnutrition.

Moreover, relative to children living in the poorest households, children living in wealthier households have a lower risk of underweight. For instance, children living in

middle wealth are 0.65 times as likely to be underweight as children living in the poorest households. This risk becomes even lower for children in rich households. Children living in richer and richest households are 0.49 and 0.36, respectively, times as likely to be underweight as children living in the poorest households. This highlights the importance of household resources in securing children's nutritional status, even among children who live with their mothers in Lesotho.

It is important to note, however, that sharing household membership with a father who has been away since birth is significant even when wealth has been controlled for in the model. This suggests that regardless of household wealth there is something about these absent fathers that is important for child nutrition. It could be the kind of resources such as medication and more nourishing food that they are able to access where they work, especially outside the country. This is most likely because South Africa is much more developed than Lesotho, and access to resources that can benefit children's nutrition is likely higher.

On the other hand, despite household wealth status, co-residence with other men remains disadvantageous for children's nutritional status in Lesotho. One explanation for this effect could be that co-resident men add pressure on household resources. It is not clear how this operates. The interactive results in Table 5 indicate that the effect of presence of other males in the household depends on presence of a father.

In figure 4, based on the interactive model in Table 5, I present the simulated probabilities of underweight for living arrangements with father and other men. The results show that co-residence with other men is associated with higher risk of underweight when children live in households with absent or deceased fathers. For

example, the predicted probability that children living in households with absent father for some part of their lives is 0.47 if there are other men co-resident, while the probability of underweight is 0.22 if there are no other men co-resident in the household. In addition, the probability that paternal orphans would be underweight is 0.15 if they co-reside with other men relative to 0.10 if they do not co-reside with other men. We see a reverse relationship when children live in households with co-resident fathers or in households where the father is not a member. In these households, young children's predicted risk of underweight is lower when there are other men co-resident in the household.

These results are interesting because they show different effects of co-residence with other men in different child-father living arrangements. In particular, if indeed absent fathers are working fathers, the negative effects of co-residence with other men could suggest extra strain on household resources. Since these are mainly grandfathers (88%) who are likely to be dependents too, additional dependents in the household increase strain on the household resources. This then implies fewer resources to boost children's nutritional status. On the other hand, the positive effect of co-residence with other men in households with co-resident fathers or father not household member or father deceased could be interpreted as extended living arrangements being advantageous in resource pooling. This warrants further exploration to understand the selectivity associated with co-resident adult male relatives in the different households.

CONCLUSION

This thesis set out to explore the context of fatherhood in Lesotho by looking at the effect of children's living arrangements with their fathers and other men on

nutritional outcomes. Due to high labor migration to South African mines in the country, the research makes an argument that we cannot export US models of fathering. In the context of high poverty and unemployment, father absence is indicative of employment and many children in the country are connected to these absent fathers through common household membership. Thus for child outcomes responsive to economic inputs such as nutrition, father absence in this setting is likely to have a positive relationship with child nutritional outcomes.

To account for important connections of children to their fathers, household membership should be considered. Household membership in this analysis was divided in three categories of living arrangements because these have different effects on children's nutritional outcomes. The results have shown that children living in households with long term absent fathers are better off in terms of long term nutritional status (stunting) and underweight, while there was no effect on short term nutritional status (wasting). This suggests that labor migration has a long term effect on children's nutrition. Since it takes a while for labor migrants to find jobs and establish themselves in South Africa, short term effects of absence of fathers could be devastating for children. However, once the father is well established, then the long term effects are enjoyed by the whole household, benefiting children's nutritional status.

It was interesting to observe that net of household wealth, children sharing household membership with long term absent fathers still fare better than children with co-resident fathers. This indicates that there is something about these absent fathers other than their income per se that tends to favor nutritional status of young children in Lesotho. Here, one possibility is that these men bring specific resources that they obtain

in South Africa that fare better than resources in Lesotho. This could be special medication and food that they are likely to access because of their location. On the other hand, absence of men in Lesotho has been associated with an increase in female autonomy (Kimane et al., 1999). If indeed women invest more in children than men, then mother's control of household resources in the absence of a father is likely to improve children's nutritional status.

Although child fosterage is prevalent in Lesotho, co-residence with other men does not seem to buffer the effects of risk of malnutrition among young children in Lesotho. In particular, the findings indicate that co-residence with other men is disadvantageous for children. This is because whether father or not, co-resident men are likely to be unemployed and therefore add strain on the already limited household resources. This is supported by the evidence that other co-resident men are mainly grandfathers who are likely to be dependents too. This then reduces the resources available for children.

Most importantly, these results have highlighted the importance of using household membership rather than just co-residence to understand children's connection with their fathers in Lesotho. Although children may never have lived with their fathers, they remain connected to them through sharing of common household membership throughout the long absence. In this setting of high division of labor, these long absent fathers are actually 'good' fathers because they are able to support their children, thus playing their expected role as father.

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TABLES

Table 1. Nutritional Status of Children aged 0 to 59 months Living with Mothers in Lesotho, 2004 N = 1363		
Nutritional Status		
Wasted	59	4.33
Stunted	504	37.71
Underweight	273	20.47

Source: 2004 Lesotho Demographic and Health Survey

Table 2. Characteristics of Children Aged 0-59 months Living with Mothers in Lesotho 2004, N = 1363

		Frequencies	Percentage
Age	0-6 months	191	14.01
	7-12 months	172	12.62
	13-24 months	274	20.10
	25-36 months	263	19.30
	37-48 months	242	17.75
	49-59 months	221	16.21
Gender	Male	692	50.77
	Female	671	49.33
Rural/Urban	Urban	231	16.95
	Rural	1132	83.05
Living Arrangements with Biological Father			
	Co-resident	572	41.97
	Absent for Some Time but HH Member	169	12.40
	Absent Since Birth but HH Member	127	9.32
	Not Household Member	371	27.22
	Deceased	124	9.10
Living Arrangements with Other Adult Men			
	Other adult men co-resident	287	21.06
	No other adult man co-resident in HH	1076	78.94
Mother's Characteristics			
	Age		
	15-19 years	106	7.78
	20-29 years	726	53.26
	30-39 years	398	29.20
	40-49 years	133	9.76
	Education		
	Primary incomplete	487	39.58
	Primary Complete	402	29.52
	Secondary and higher	421	30.91
	Current Marital Status		
	Never Married	142	10.42
	Married[5]	1054	77.33
	Widowed	96	7.04
	Divorced and Separated	71	5.21
Household Characteristics			
	Mean No. of Children (0-14)	3.20	
	Mean No. of Young Children (0-4)	1.58	
	Household Wealth Index		
	Poorest	339	24.87
	Poor	350	25.68
	Middle	264	19.37
	Richer	221	16.21
	Richest	189	13.87

Source: 2004 Lesotho Demographic and Health Survey

[5] Married includes 6 children whose mothers were living with a partner, but not married.

Table 3. Logistic Regression of Wasting on Living Arrangements with Fathers for Children 0-59 months Living with Mothers in Lesotho, 2004, N = 1363		
		Odds Ratios
Demographic Characteristics		
Child Age	7-12 months	1.038
	13-24 months	1.249
	25-36 months	0.522
	37-48 months	0.541
	49-59 months	0.442
	(0-6 months omitted)	
Male		0.763
Urban		1.077
Mother's Characteristics		
Age	20-29 years	1.986
	30-39 years	1.815
	40-49 years	1.649
	(15-19 years omitted)	
Education	Primary Complete	0.545†
	Secondary and higher	0.449*
	(Incomplete primary and no education omitted)	
Marital Status	Married	0.838
	Divorced or Separated	0.951
	Widowed	2.526
	(Never Married Omitted)	
Mother's Log Percentile of Height-for-Age		1.001
Living Arrangements with Father		
	Absent for some time but HH Member	0.992
	Absent since Birth but HH Member	1.719
	Not HH Member	0.975
	Deceased	0.404
	(Co-resident Omitted)	
Co-residence with Other Men		0.484
(No other adult male co-resident		
-2 log likelihood		-230.85
df		21

†p<.10; * p<.05; ** p<.01; *** p<.001

Source: Lesotho Demographic and Health Survey, 2004

Table 4. Logistic Regression of Stunting on Living Arrangements with Fathers for Children 0-59 months Living with Mothers in Lesotho, 2004, N = 1350

Demographic Characteristics		Odds ratios
Child Age	7-12 months	2.413***
	13-24 months	7.338***
	25-36 months	5.374***
	37-48 months	6.499***
	49-59 months	6.831***
	(0-6 months omitted)	
Male		0.959
Urban		1.047
Mother's Characteristics		
Age	20-29 years	0.976
	30-39 years	0.859
	40-49 years	1.232
	(15-19 omitted)	
Education	Primary Complete	0.879
	Secondary and higher	0.803†
Marital Status	Married	1.114
	Divorced or Separated	0.666
	Widowed	1.351
	(Never Married omitted)	
Mother's Log Percentile Height-for- Age		0.762***
Living Arrangements with Father		
	Absent for some time but HH Member	1.097
	Absent since Birth but HH Member	0.626*
	Not HH Member	0.967
	Deceased	1.084
	(Co-resident Omitted)	
Living Arrangements with Other Men		1.384*
(No other adult men in HH omitted)		
No. of Young Children in HH		1.026
Socio-Economic Status		
	Poorer	1.077
	Middle	0.789
	Richer	0.672†
	Richest	0.677
-2 log likelihood		-798.12
df		26

†p<.10; * p<.05; ** p<.01; *** p<.001

Source: Lesotho Demographic and Health Survey, 2004

Table 5. Logistic Regression of Underweight on Living Arrangements with Fathers for Children 0-59 months Living with Mothers in Lesotho, 2004, N = 1350

		Additive Model	Interactive Model
Demographic Characteristics		**Odds Ratios**	**Odds Ratios**
Child Age	7-12 months	4.557***	4.402***
	13-24 months	10.019***	10.046***
	25-36 months	12.053***	12.343***
	37-48 months	9.241***	9.358***
	49-59 months	13.237***	13.322***
	(0-6 months omitted)		
Male		1.124	1.109
Urban		1.351	1.376
Mother's Characteristics			
Age	20-29 years	1.201	1.165
	30-39 years	1.157	1.147
	40-49 years	1.356	1.374
	(15-19 years omitted)		
Education	Primary Complete	0.845	0.858
	Secondary and higher	0.712†	0.722†
	(Incomplete primary and no education omitted)		
Marital Status	Married	0.686	0.694
	Divorced or Separated	0.514	0.527
	Widowed	1.725	1.855
	(Never Married Omitted)		
Mother's Log Percentile of Height-for-Age		0.792***	0.794***
Living Arrangements with Father			
	Absent for some time but HH Member	1.223	0.908
	Absent since Birth but HH Member	0.715*	0.630†
	Not HH Member	0.732	0.801
	Deceased	0.368†	0.286*
	(Co-resident Omitted)		
Co-residence with Other Men		1.473*	1.442*
(No other adult male co-resident			
No. of Young Children in HH		1.346**	1.306*
Socio-Economic Status			
	Poorer	0.909	0.911
	Middle	0.646*	0.656†
	Richer	0.489*	0.487*
	Richest	0.363**	0.359**
Interactions	Father absent for some time*Other men co-resident		1.164**
	Father absent since birth *Other men co-resident		1.045
	Father not HH member * Other men co-resident		1.338
	Father deceased *Other men co-resident		1.638†
-2 log likelihood		-602.71	-595.91
df		26	30

†p<.10; * p<.05; ** p<.01; *** p<.001

Source: Lesotho Demographic and Health Survey, 2004

FIGURES

Figure 1.Proportion of Children 0-59 months by Living Arrangements with Fathers and Age, Lesotho 2004

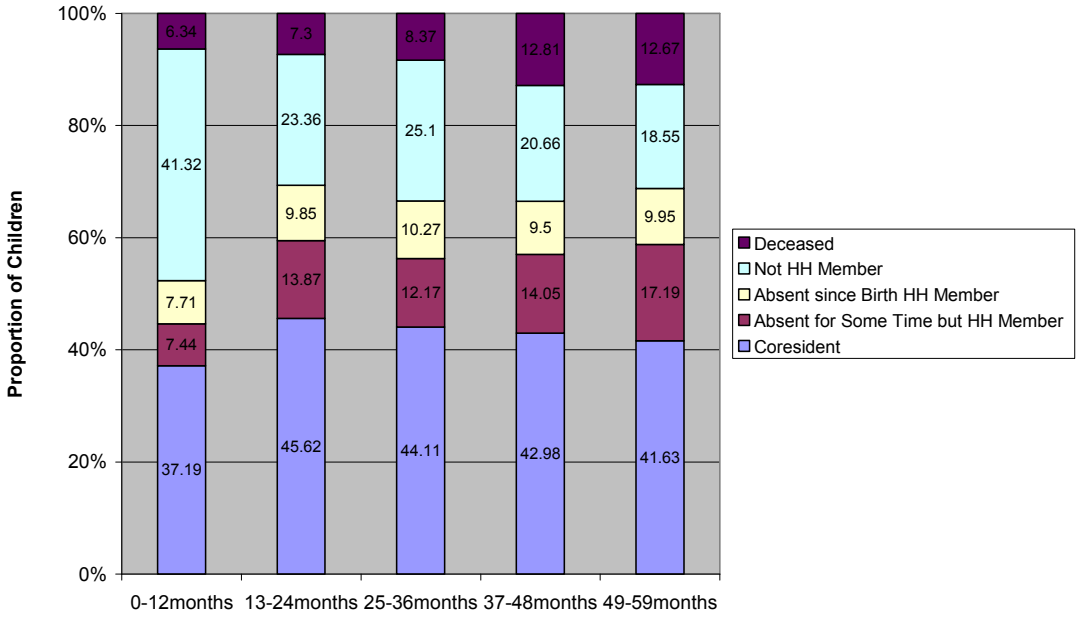

Figure 2. Children's Nutritional Status by Age, Lesotho 2004

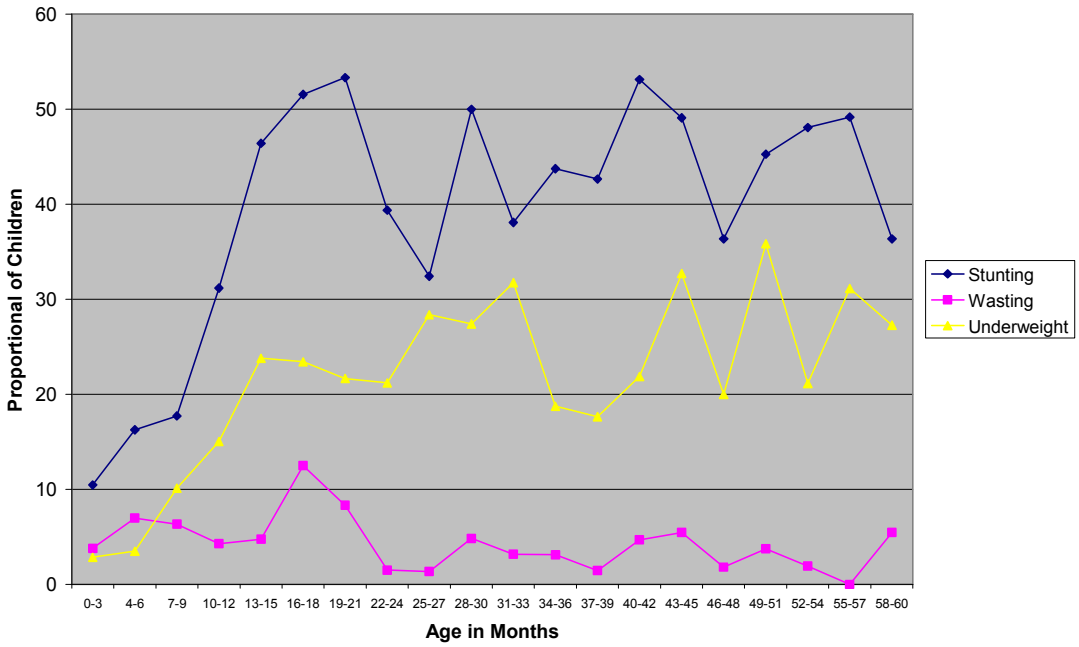

Figure 3. Nutritional Status of Children 0-59 months by Living Arrangements with Biological Father, Lesotho 2004

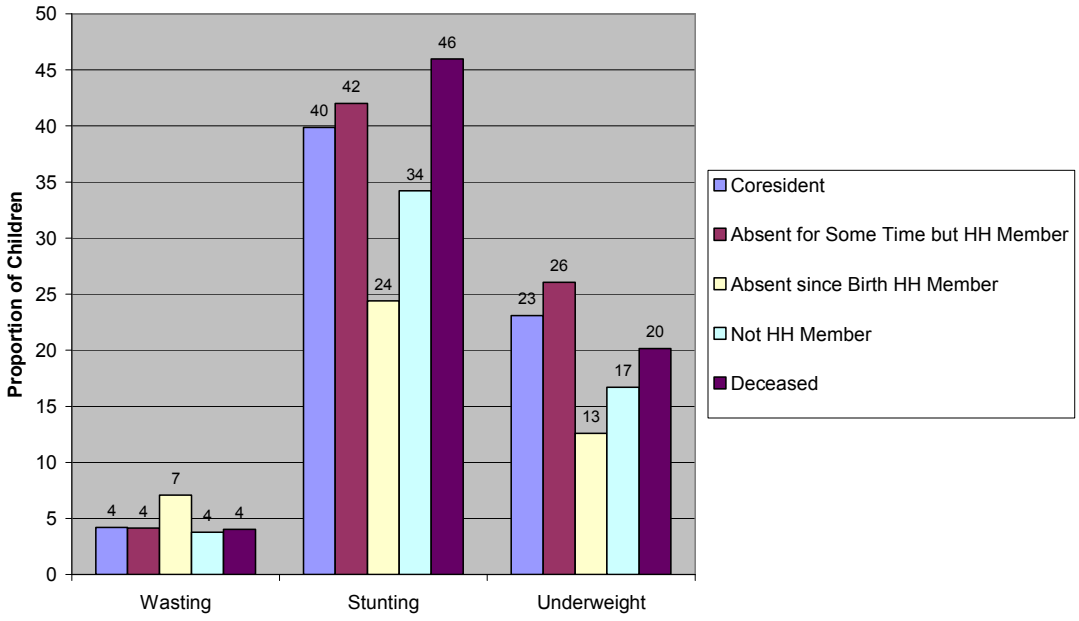

Figure 4. Simulated Probabilities of Underweight by Living Arrangements with Fathers and Other Men