Abstract

In South Africa, high levels of poverty and HIV/AIDS are believed to be impacting negatively on both social capital, and food security. This study tests the association of household social capital with household poverty, food security, AIDS status in three rural communities in South Africa. A total of 254 households were subject to three repeat (every three months) food security assessments, where an experiential measure of hunger was collected in conjunction with a 2 day detailed dietary recall of all food types eaten for a household dietary diversity score (HDDS). A record was kept to foods donated by neighbours. The study found that neither social capital nor presence of donated foods in the diet was associated with household poverty status; AIDS attributed chronic illness or mortality. Household fostering AIDS orphans, however, had greater social capital, and greater donated foods. Logistic regressions showed that high social capital is significantly associated with higher HDDS but not heightened experience of hunger when controlling for household socio-economic status. The elevated HDDS is not, however, attributable to greater use of donated food. Rather, it is more likely to be attributable to the tendency for high social capital scoring households to participate in community gardens.

Introduction

A proliferation of recent articles have drawn attention to the importance of defining and developing the concept of "social capital" in health (Galea et al, 2005; Kawacher et al, 1997; Pilkington, 2002; Siahpush et al, 2006) and development studies (Grooteart and Bastelear, 2001). More recently, the contribution of social capital, or "social safety nets and social protection" to household food security has been highlighted (Wiggins et al, 2004). In the USA, the relationship between social capital and food security has recently been explored by Martin et al (2004) who found that high social capital is associated with lower odds of household hunger, where a experiential self-rated measure was to determine the presence of hunger. This study sought to build on the work of Martin et al, firstly by repeating their study in a developing country context, and secondly subjecting the validity of the findings to more rigorous testing through the inclusion of a quantitative food security indicator in addition to a user-rated experiential measure. Moreover, given the importance that has been given to the community level impact of HIV/AIDS on household food access, as well as social capital, the effect of the presence of AIDS proxies in the household on social capital was recorded. The goals of this study were to (1) measure and analyse social capital at the household level in a developing country context, (2) examine possible associations between social capital and both a qualitative and quantitative index of food security and (3) explore and quantify the mechanisms by which social capital may contribute to food access.

Background

Social capital

While there is no universal definition of social capital, there is a growing consensus that it includes trust, social participation and norms of reciprocity (Helliwell & Putnam, 2004; Kawachi et al, 2004; Saihpush et al, 2006).Social capital is also very much tied to acquisition of resources, and Kawachi (1999, p.121) defines social capital as "the resources available to individuals through their behaviours and membership in community networks". In development discourse forms an essential part of the so-called 'sustainable livelihoods framework', which famously includes 'social capital' as one of the essential resources that form part of the so-called 'asset pentagon' (DFID, 2000).

The conceptualisation of social capital as a resource, while useful, needs to be carefully dealt with. As Fike (2003) notes, social capital has been used to "mop up" all the resources not included in physical, financial, human and natural capital. These actual resources are often ill

defined, and may come with considerable claims of reciprocity and social obligation, which ultimately have negative economic consequences (Burt, 1997; Portes, 1998; Adato et al, 2006). As du Toit et al (2005) note, social capital is not just a 'good' that needs to be maximised. Rather, researchers need to keep sight of the key issue, which is to understand not only what resource exchanges are occurring from the kinds of exchanges and relationships 'social capital' makes possible, but also a clearer understanding who benefits, and who does not. The inference that "social capital is the capital of the poor" (Woolcock and Narayan, 2000, Grootaert and Swamy 1999) is also in need of critical examination. Recent longitudinal data analyses by Gertler et al (2006) in India, and Adato et al (2006) in South Africa, have found little support of this notion, and indeed suggest that the reverse might even be true. Although neighbours and family members can be relied on to prevent destitution and stabilise resources, they are not in a position to help the household out of poverty because they too lack resources (Adato et al, 2006). Stable non-poor households make the greatest use of social networks which enable fortification of household wellbeing through the spreading of opportunities for employment; advice, contacts to employers (Wilson, 1996; Adato et al, 2006). This research sought to probe the relationship between social capital and resource access in a manner that is sensitive to the relationship between social capital poverty, as well as the discourse of entitlement and selective benefits.

Food security, Social Capital and HIV/AIDS

Food security is a concept that has at its heart, poverty and the dynamics of resource exchange. As a result, it is ideally positioned to probe the interface of current debates around social capital and resource access development discourse. Although descriptive, anthropological studies have long shown the pertinence of asset transfers during periods of prolonged food insecurity (see Rangasami, 1985; Pottier, 1999), the emphasis of these works have been more to expose the importance of these processes in subverting and maintaining structural power inequalities in times of heightened social and economic tension. The importance of social capital in maintaining household food access has not been widely studied. In developing country contexts, recourse on neighbours and relatives for food in times of hardship is a common coping strategy that has been widely documented in a range of cultural contexts (Maxwell et al, 2003). Despite this, we still have relatively little information on how this coping strategy relates to community and household level social capital status, and in turn, how this social capital status affects household food access. We also have very little understanding as to the socio-economic profile of those who employ this coping strategy, and what the cultural context of these activities is.

With a population of over 47 million people and an estimated 5.3 million people infected with HIV, South Africa has the second highest number of individuals living with the HIV virus in a single country (Population Reference Bureau 2006). AIDS has had a devastating effect on many aspects of development, including food security (SADC FANR VAC, 2003; De Waal & Whiteside, 2003; Gillespie and Kadiyala, 2005). Food security research that builds on an understanding of how AIDS is exacerbating this condition is urgently needed (Hendriks, 2005). AIDS is so damaging to food security precisely because it erodes food security resilience on multiple levels (De Waal and Whiteside, 2003). This is because AIDS not only restricts financial capital, human and physical capital AIDS is believed can compromise social capital networks (Jayne et al., 2006; Thomas, 2006), which is believed to be critical to food security (Martin, Rogers, Cook & Joseph, 2004). This study aimed to explore whether the theoretical tendency of AIDS to cause "social fragmentation", where societies "unravel" (Bryceson, 2003) was evident in the study sites, and associated with household food access.

In order to conduct this study, relevant food security assessment tools had to be carefully selected. In the study by Martin et al (2004), the food security indicator used was an experiential (user rated) measure of household hunger based on over 2 decades of research

conducted in a US context. In developing countries, where food security indicator validation has a less impressive pedigree, the question has been raised as to how well experiential indicators collate with quantitative benchmarks of actual food intake (Migitto, Davis, Carletto and Beegle, 2005). As a result, this research made use of both a subjective, experiential measure of household food insecurity and an objective, quantitative measures of food intake. Furthermore, both the quantitative and qualitative index were disaggregated to account for social capital linked resource inputs. In the study by Martin et al (2004), authors suggested that the association of social capital with the user-rated experience of hunger and resource restriction may be attributable to food resource reciprocity; as households with high social capital are potentially more able to borrow resources such as a car, money or food. However, the study did not quantify the extent to which these resources are actually being materially employed in household food access. Thus, it is possible that a household's social capital ranking (which is sensitive to the respondents sense of *social security*) may be strongly correlated with the experiential, psycho-social dimensions of the *food security*, where user-defined hunger "and *uneasy or painful sensation* caused by lack of food" (Martin et al, 2004, p. 2646, own emphasis). This study sought to specifically target how, if at all, heightened social capital *materially* advances household access to food resources. This was done through recording the presence of donated food in the quantitative food security index. In the qualitative index, recourse on neighbours as a food insecurity coping strategy was included as an item in the scale (table 1).

Methods

Sample

The study populations were three rural sites in South Africa; the settlement of Moloweni in the Eastern Cape province; and in the Province of KwaZulu Natal, the Mahlayizeni settlement in Nkandla, and the KwaDlangezwa settlement in Zululand. The study was conducted as part of a larger research project into the relationship between rural livelihoods and household food security, which places specific emphasis on household and community level impacts of HIV/AIDS. AIDS effects are explored by means of five household AIDS proxies, defined by SADC FANR VAC (2003). These are (1) morbidity within 0-59 age group (2) with free treatment; (3) mortality within the last 2 years of someone aged 0-59 (4) preceded by 3 months of chronic illness; and (5) orphan fostering. The sampling frame was drawn up from aerial photographs of the settlement areas. In the first wave of research all households within the sampling frame (n<300) were initially assessed through a sweep census that recorded household AIDS proxies. Census surveys were then classed into three groups, based on the number of AIDS proxies each household had accumulated. Class 1 (34.2%) had no proxies, Class 2 had 1-2 (48.5%) proxies and Class 3 (16.8%) had 3-5 proxies. A random selection of 30 households in class 1, 2 and 3 was selected for each site, resulting in a total sample size of 270. Informed consent was attained by the target households to participate in the study, where participants were informed as to the goals and purpose of the study, assurance that participants could withdraw at will, and assurance of confidentiality. These household were then subject to a total of three repeat food security assessments at three monthly intervals over a nine month period from October 2006-June 2007. Surveys were completed door-to-door using trained interviewers. Participants were not paid for their participation. Over the course of 9 months, 15 households withdrew from the study or had to be abandoned due to household desertion, resulting in a final sample size of 255.

Survey Instrument

The survey instrument included two measures of household food security (and experiential and quantitative) measure, a measure of social capital, household demographics and household AIDS proxy status.

Food security measures

(1) The quantitative measure of food security was a Household Dietary Diversity Score (HDDS). HDDS, has been shown to perform well against benchmarks of overall dietary quality (Savy *et al*, 2005), and quantitative measures of nutrient adequacy (Ogle, Hung & Tuyet, 2001; Torheim *et al,* 2004; Azadbakht, Mirmiran & Azizi, 2005) on the Asian (Chung, Haddad, Ramakrishna and Reiley, 1997; Ogle, Hung & Tuyet*,* 2001) and African continents (Savy *et al*, 2005).

The dietary diversity assessment tool was adapted from the methodology originally suggested by Kant *et al* (1991), and more recently adapted by Hatloy *et al* (2000) for developing countries. Refer to Swindale and Blinsky (2005) for a full indicator guide. In brief, the methodology required that respondents enumerate how many of ten food groups (cereals; roots and tubers; vegetables; fruits; pulses, nuts and legumes; meat; fish and shellfish; dairy; fats and oils; sugars) were consumed as part of a household meal in the last 48hs. A household meal was defined as a meal in which at least two household members partook in. In order to account for the importance of social capital in food resource access, each food group recorded in the HDDS was disaggregated to account for method of food acquisition. This responded was asked to recall the source of the food reported in the dietary recall. This could be (a) purchased, (b) grown, (c) collected (for wild foods) or (d) donated.

The 48 hour (2 day) recall was repeated for each household at 3 monthly intervals, so that that for each household a cumulative total of 144 hours (or 6 days) of dietary recall over a nine month period were derived. Repeat spaced assessments were used in order to control for seasonal fluctuations in HDDS, and to ensure greater reliability from the food security indicators. The HDDS were then summed to derived a 144 hour HDDS. Dividing this HDDS by 6 gives the average 24 hour HDDS for that household.

(2) The qualitative measure of food security used was a 16-item Coping Strategy Index (CSI) with four response categories, adapted from the method developed and piloted Maxwell et al (1995, 1999, 2003) by the WFP and CARE international for use in detecting short-term food insecurity in developing countries. The CSI (see table 1) was piloted quite extensively by the author using focus groups in all three sites, and quantitatively in 178 cross sectional, randomised household surveys in the Nkandla district in 2006. In the pilot the CSI showed good collation with an HDDS benchmark, and most of the items were well received, with the exception of strategies to decrease household size (sending family members to eat elsewhere, sending household members to beg), which did not appear to be practices in the research sites and were often confused with “asking neighbours for food”, which was quite a common and socially acceptable coping strategy in the research sites. These two items were subsequently dropped. The remaining 16 items used in this study are listed in Table 1.

The items in Table 1 are divided into two sub-sections. The first sub-section includes 9 items that measure the household’s experience of food resource restriction (ERR). Namely uncertainty or worry about food, food of inadequate quality, quantity (which may occur with or without hunger) and the consumption of socially unacceptable food. These four domains of food insecurity were initially identified by Radimer, Olsen and Campbell (1990), and form the basis of the US national Household Food Security Survey Measure (HFSSM). Items covering these four domains have been tested quite extensively by Maxwell et al (1995, 1999, 2003) in approximately 12 developing countries More recently, they have been used to form

the basis a Household Food Insecurity Access Scale (HFIAS), which has shown promise of accuracy relevance across a range of developing country contexts and cultures (Coates *et al*, 2004 2006), following testing in Burkina Faso (Frongilo & Namana, 2003; 2006) and Bangladesh (Frongillo, Chowdhury, Ekström & Naved, 2003). Furthermore, recent findings of Frongilo and Nanama (2006) in Burkina Faso, who have shown that these experiential measures of food insecurity can indeed collate well with measures of dietary diversity, provided the association is interpreted within the context of a sensitivity to seasonal and temporal fluctuations. The final 8 items on the CSI relate to household coping strategies or Experience of Resource Augmentation (ERA). The ERA items are the same as the ones proposed by Maxwell et al (2003), however, the item relating to accessing wild foods was disaggregated into one item for wild plant foods, and one item for wild animal foods. This is because exploratory research in 2006 revealed that hunting (a primary male activity, often engage in by children) and wild plant gathering (mostly by adult women) had very different cultural associations. Wild plant gathering was also a much more frequently engaged in and socially acceptable activity than wild meat consumption.

The CSI was repeated in conjunction with the 48 hour HDDS through three door-to-door household visits spaced at three monthly intervals. At each assessment, and respondents were asked to recall their experience of the 16 items over the last three months. For analysis, the average household's response value (0-3) for each item was used. Average ERR, ERA and CSI totals were also used. Maxwell et al (2003) suggest that the CSI items be weighted using community ranks of the perceived item severity as a coping strategy. The response items in this study were not, however, weighted. The HFIAS does not use weighting of their responses, and pilots of a community weighted analysis in Nkandla in 2006 did not demonstrate any significant statistical power was derived from this action.

Social capital measure

To measure social capital, a seven-item Likert scale with four response categories was used. This scale is adapted from an instrument used to measure the collation between experience of hunger and social capital used by Martin et al (2004) in Connecticut, USA, which in turn was adapted from an instrument developed and validated by Sampson et al (1997) in the (USA?*). Sampson's index is designed to measure social cohesion, participation, values, trust and norms of participation and reciprocity. At the time of its development, this range of dimensions of social capital were also being shown to have a similar underlying structure and clustering of variables in a range of contexts, including East and West Africa * Ghana and Uganda (Narayan and Cassidy, 1999) and India (Krishna and Shrader, 1999). Subsequent work has used these same concepts to define and measure social capital (Helliwell & Putnam, 2004; Kawachi, Kim, Coutts, & Subramanian, 2004; Siahpush et al, 2006).

Responses were divided into "strongly disagree", "disagree", "agree" or "strongly agree" with Score allocations ranging from 1 to 4 respectively. Two questions that were worded negatively were reverse coded. The social capital scores ranged from zero to twenty eight for seven questions. The questions were also collapsed into binary indicators scoring 0 for a negative response and 1 for a positive response, and deriving an alternate index of zero to seven. The following questions comprised the social capital scale:

1.People around here are willing to help their neighbours.
2.This is a close-knit, or ''tight'' neighbourhood where people generally know one another.
3.If I had to borrow R50 (US$7.50) in an emergency, I could borrow it from a neighbour.
4.People in this neighbourhood generally don't get along with each other.
5.People in this neighbourhood can be trusted.
6.If I were sick I could count on my neighbours to shop for groceries for me.
7.People in this neighbourhood do not share the same values.

The following additional questions were asked in this study regarding residency
1.How long have you lived in your house?
2.How long have you lived in this village?

As group membership and civic involvement are considered important aspects of social capital, the following question was included.

Is anyone in your household a member of any social or civic organizations, such as the PTA, a community organization, or a religious organization?

The median response for the 7 index scale was 6, and for the 28 index scale it was 20. Data were categorised into high or low social capital, for continuous scores corresponding to above or below the median. For household food security, socio-demographic and economic variables, the 28 index scores were used. For the AIDS proxies, the 7 index scores were used, as the 7 index scale appeared to have more sensitivity to AIDS proxy associations.

Household socio-economic and AIDS profile

The following demographic information were also collected; highest level of education completed by each adult in the household, where the score 1 corresponded to no education, 2 some elementary school, 3 elementary school completed, 4 some senior school, 5 senior certificate and 6 tertiary education. The mean education level for all the adult members was then derived for each household. Household social grants, and earned income were also recorded, as were the presence of household wealth proxies (household appearance, asset ownership) and also livestock ownership. Wealth proxies and livestock proxies were weighted according to their relative monetary value and used to derive a household wealth ranking on a continuous scale. Household demographic characteristics (age, sex, relations of household members) and AIDS proxies, as detailed in the sample section, were also recorded.

Logistic regression models

Two regression models were used to determine if social capital, at the household level, significantly decreases the odds of experiencing food security when controlling for household socio-economic and demographic variables.

Model 1: does higher household level social capital decrease odds a high ERR, when controlling for household socio-economic and demographic variables?
Log likelihood (high household ERR) = F (household-level social capital +Household size + Total household income+ average adult education level.

Model 2: does higher household level social capital decrease odds a low HDDS when controlling for household socio-economic and demographic variables?
Log likelihood (Low household HDDS) = F (household-level social capital +Household size + Total household income+ average adult education level

Results

Community level determinants

Forty percent of all households had at least one food donated by a neighbour or community member in their 6 day HDDS (figure 1). Table 2 lists household characteristics by social capital, food security and donated food status. Presence of donated food was in no was associated with social capital scores. This was true for categorised data represented in table 2, as well as t-tests done on continuous social capital scores and logistic regressions performed on presence of donated foods in the HDDS with social capital as a independent variable

(analyses not shown here). Moreover, neither social capital scores nor presence of donated foods in the HDDS was significantly associated with any measures of household wealth. However households with high numbers of adult males may be more likely to ask for donated food. Logistic regression models showed that for every additional adult male in the household, odds of having a donated food in the HDDS increase by 27%. Income as a controlling factor was not significant in this model. Households headed by a senior (60 plus) were also more likely to have high social capital, as were households with high average adult education. Households with a household member part of a civic organisation were more likely to have high social capital, and less likely to have donated foods. Household with high social capital were also more likely to have a grown food in their HDDS. Donated food was significantly associated with a number of items in the food insecurity index. Those with donated foods were more likely to eat a limited variety of food and embarrassing foods, and they were more likely to report harvesting immature crops. Presence of donated foods was not, however, associated with overall HDDS, ERA, ERR or CSI. Social capital was, however, significantly associated with higher HDDS, lower ERR and CSI, but not ERA.

Table 3 lists breakdowns the frequency distributions of AIDS proxies by household social capital status, and presence of donated food(s) in the 6 day HDDS. The presence in the household of recent death (someone under 60), and chronic illness (someone under 60), was not associated with either social capital or presence of donated foods. However, household fostering orphans had higher social capital. Households fostering paternal orphans had both higher social capital and higher incidence of donated food in the 6 day HDDS. Logistic regression models (not shown here) which explored the log likelihood of donated foods occurring in a paternal orphan fostering households HDDS found that the effect of paternal orphans on increasing donated food was no longer significant when household size, income and education were included as covariates in the model. However, the effect of paternal orphans on increasing social capital was still significant when household size and income and education were included as covariates in the model. Indeed, this affect was so significant, household size, income and education failed to show statistical significance at all when social capital was included in the model.

Logistic regression models

Logistic regression models showed that social capital, although initially associated with greater odds of experiencing higher resource restriction (ERR), was no longer significant when controlling for household socio-economic status (model 1, table 4). However, the same was not the case for HDDS, which was significantly positively associated with higher social capital even when controlling for household size, income, and education (model 2, table 4). The model shows that, holding all else constant, for every additional point on the 28 point social capital index, the odds of having a high HDDS increase by 11% even when controlling for household socio-economic status and demographics.

Discussion

Most studies on social capital find social capital to be positively associated with household wealth status and education (Galea et al, 2005; Kawacher et al, 1997; Pilkington, 2002; Martin et al, 2004; Adato et al, 2006, Siahpush et al, 2006). This study confirmed the latter, but failed to confirm the former. In other words, social capital was associated positively with

average adult education, but not with wealth status. In keeping with the literature, other strong determinants of social capital included the age of the household head and involvement in civic organisations.

It is notable that social capital was in no way associated with presence of donated foods in the HDDS. Thus, the theory that social capital affects food resource access through facilitating resource "transfers" (Martin et al, 2004) is in need of serious review, at least in this context. Donated food did have significant associations with some of the questions in the ERR, which indicates that those household who are requesting donated food are doing so as a response of heightened food insecurity, rather than their social capital standing.

This study found little evidence to support the belief that household AIDS status can compromise social capital networks (Jayne et al, 2006; Thomas, 2006). Social capital failed to be negatively associated with the presence of household AIDS proxies. Indeed, the opposite was the case. Household fostering orphans appeared to have a higher experience of community level social capital, which was highly significant when controlling for socio-economic factors. However, increased incidence of donated foods in paternal orphan fostering households HDDS was not significant when controlling for other factors, which suggests that although these households have heightened social capital, it is not the primary reason for increased donated foods. Socio-economic determinants are more at play here. Why only paternal orphaned households experienced elevated social capital is not clear, but may have something to do with the fact that paternal orphans would usually be retained in the father's household by the fathers kin, where as maternal orphans would be sent back to their mother's original village, and thus as newcomers have diminished social standing.

This study failed to confirm the findings of Martin et al (2004) for communities in the USA, that social capital is significantly associated heightened experience of hunger. Although social capital was, in simple categorised chi-squared tests of significance, significantly associated with ERR, this association failed to hold when socio-economic co-variants were introduced in the model. However, the study did find that social capital was significantly positively associated with elevated HDDS, the quantitative food security indicator used in this study. This suggests that household with higher social capital are acquiring additional food groups from sources independent of financial capital. This study originally hypothesised that these independent sources would be donated foods. However, as donated foods are not significantly associated with either HDDS or social capital we must reject this hypothesis. Where then are social capital households deriving their "extra" food groups? Given that incidence of grown foods in the HDDS are significantly associated with both heightened HDDS and heightened social capital, it is likely that high social capital scoring households are in fact deriving their heightened HDDS scores from the inclusion of grown foods, and not donated foods in their diet. This collates well with the tendency of high scoring social capital and HDDS households to be associated with community organisations, which are often community gardens and co-ops.

This study reveals the complexity of social capital linked resource transfers. As yet there is no "gold standard" for measuring social capital (Martin et al, 2004), and there is certainly no standard for measuring aspects of social capital that relate to food access. Indeed, food access as a form of social capital linked resource transfers has been greatly under researched. For example, qualitative research by Adato et al (2006) in KwaZulu Natal, South Africa, identified over 20 ways in which social assets are used; including cash loans, savings and borrowing groups, and community gardens. No mention was made, however, of donation of food. In the absence of more reliable data, the types of resource transfers that social capital facilitates cannot be assumed. Although heightened incidence of donated foods in a households diets seems to be reasonable material consequence of heightened food security in the presence of elevated social capital, more critical analysis reveals that in the research context this is not the necessarily the case. This research indicates that it is perhaps increased

involvement in civic organisations, including community food gardens, that is the most important material consequence of elevated social capital to household food access.

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Table 1 The Coping Strategy Index	Points allocated in Index			
	Never	1 time a week	2 or 3 times a week	4 times a week or more
Experience of Resource Restriction (ERR)				
Food discomfort experience				
1. Did you, or anyone in your household, worry about not having enough food?	0	1	2	3
2. Were you, or anyone in your household, not able to eat foods you preferred?	0	1	2	3
3. Were you, or anyone in your household, forced to eat a limited variety of foods?	0	1	2	3
4. Were you, or anyone in your household, forced to eat food you preferred not to eat?	0	1	2	3
5. Did you, or anyone in your household, eat a smaller meal than they felt they needed?	0	1	2	3
6. Did you, or anyone in your household, eat fewer meals in the day than you would have liked to because of no food?	0	1	2	3
Severe hunger experience				
7. Was there ever no food at all in the house?	0	1	2	3
8. Did you, or anyone in your household, go to sleep hungry	0	1	2	3
9. Did you, or anyone in your household, go a whole day without eating anything due to lack of food?	0	1	2	3
Experience Resource Augmentation (ERA)				
10. Did you, or anyone in your household, borrow food or go to relatives or friends?	0	1	2	3
11. Did you, or anyone in your household, sell any of your animals to buy food	0	1	2	3
12. Did you, or anyone in your household, buy foods on credit from a shop?	0	1	2	3
13. Did you, or anyone in your household, collect and eat wild spinaches?	0	1	2	3
14. Did you, or anyone in your household, collect and eat wild animals, or other wild protein like insects or birds?	0	1	2	3
15. Did you, or anyone in your household, harvest immature crops?	0	1	2	3
16. Did you, or anyone in your household, work for food?	0	1	2	3

Table 1: Questions appearing in the Coping Strategy Index

Figure 1: % of HDDS recording presence of one or more donated foods

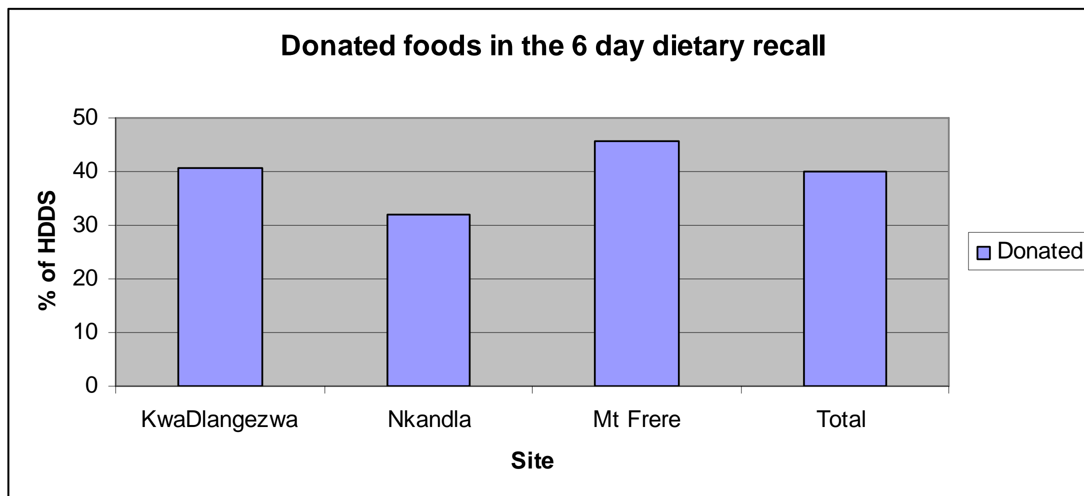

Table2	*Low or High Social Capital*			*Low, Medium or High HDDS*			*Low, Medium or High ERR*			*Low, Medium or High ERA*			*Presence of Donated food(s) in HDDS*		
Variable	p value	Chi Squared		p value	Chi Squared		P value	Chi Squared		p value	Chi Squared		p value	Chi Squared	
Female Headed	0.43	0.617		0.92	0.009		0.05	5.884	**	0.18	3.456		0.18	1.776	
HHH over 60	0.04	4.353	*	0.37	2.011		0.33	2.188		0.40	1.849		0.26	4.944	
HH size large or small	0.59	2.983		0.22	3.046		0.00	12.276	*	0.61	0.991		0.07	3.403	**
High or Low No. of children U19	0.37	0.285		0.89	0.230		0.03	6.712	*	0.50	1.302		0.22	1.512	
High or Low No. adult females	0.53	0.396		0.02	7.820	*	0.03	6.907	*	0.49	1.443		0.44	0.590	
High or Low No. adult males	0.46	0.550		0.15	3.855		0.26	7.305		0.95	0.100		0.01	6.166	*
High or Low earned income	0.53	0.396		0.21	3.086		0.72	0.669		0.61	0.997		0.44	0.590	
High or low grant Income	0.61	0.263		0.27	2.631		0.81	0.412		0.75	0.582		0.57	0.315	
High or Low total income	0.38	0.776		0.00	14.102	*	0.05	6.169	**	0.22	3.072		0.80	0.066	
High or Low livestock proxies	0.26	0.257		0.00	0.162	*	0.04	4.227	*	0.12	4.228		0.61	0.262	
High or Low wealth proxies	0.98	0.008		0.04	6.442	*	0.36	2.044		0.32	2.201		0.28	1.159	
High or Low ave. adult education	0.02	5.721	*	0.08	5.009	**	0.87	0.284		0.34	2.148		0.12	2.359	
Donated food ***	1.00	0.000		0.09	4.881	**	0.99	0.011		0.28	2.519		n/a	n/a	
Grown food ***	0.01	6.360	*	0.00	16.468	*	0.02	7.837	*	0.22	3.015		0.02	5.573	*
Wild food ***	0.34	4.315		0.55	1.183		0.00	43.314	*	0.04	6.668	*	0.83	0.049	
High or Low Social capital index	n/a	n/a		0.01	9.862	*	0.00	12.135	*	0.48	1.462		0.43	0.600	
1. Willing to help	n/a	n/a		0.03	6.853	*	0.00	15.442	*	0.21	3.079		0.24	1.379	
2. Close knit	n/a	n/a		0.18	3.425		0.01	5.407	*	0.07	5.361	**	0.64	0.216	
3. Borrow R50	n/a	n/a		0.16	3.685		0.00	13.679	*	0.04	6.276	*	0.50	0.464	
4. Get along	n/a	n/a		0.00	11.089	*	0.00	19.088	*	0.01	9.525	*	0.13	2.242	
5. Trust	n/a	n/a		0.06	5.627	**	0.03	7.219	*	0.09	4.873	**	0.73	0.116	
6. Shop groceries	n/a	n/a		0.07	5.398	**	0.21	3.105		0.65	0.849		0.93	0.007	
7. Values	n/a	n/a		0.80	0.441		0.33	2.193		0.07	5.231	**	0.09	2.837	**
Long or short residence in HH	0.43	0.617		0.45	1.600		0.00	11.938	*	0.99	0.027		0.65	0.211	
Long or short residence in Village	0.22	1.511		0.51	1.342		0.00	14.508	*	0.40	1.816		0.28	1.158	
Member of organisation	0.00	8.187	*	0.00	14.177	*	0.05	5.981	**	0.39	1.861		0.02	5.479	*
Tercile 6 Day HDDS	0.01	9.862	*	n/a	n/a		0.00	36.247	*	0.46	3.620		0.44	1.629	
1. Worry about food	0.31	2.321		0.00	20.631	*	n/a	n/a		0.02	12.302	*	0.17	3.586	
2. Eating non-preferred food	0.01	9.706	*	0.00	32.347	*	n/a	n/a		0.00	17.448	*	0.08	5.067	
3. Limited variety	0.02	7.770	*	0.00	35.102	*	n/a	n/a		0.00	17.460	*	0.00	12.894	*
4. Embarrassing food	0.11	4.465		0.00	24.942	*	n/a	n/a		0.00	18.289	*	0.05	6.101	**
5. Smaller meals	0.27	2.265		0.00	24.244	*	n/a	n/a		0.00	40.482	*	0.03	6.904	*

6. Fewer meals	*0.00*	20.325	*	*0.00*	36.028	*	*n/a*	n/a		*0.01*	13.017	*	0.32	2.297	
7. No food in house	*0.02*	7.655	*	*0.00*	29.642	*	*n/a*	n/a		*0.00*	23.282	*	0.30	2.392	
8. Sleep hungry	*0.22*	2.997		*0.00*	23.891	*	*n/a*	n/a		*0.00*	48.892	*	0.56	1.159	
9. Whole day no food	*0.36*	2.070		*0.00*	25.084	*	*n/a*	n/a		*0.00*	39.161	*	0.78	0.489	
Tercile ERR	*0.00*	12.135	*	*0.00*	36.247	*	*n/a*	n/a		*0.00*	23.937	*	0.41	1.793	
10. Borrow food	*0.12*	4.191		*0.01*	12.995	*	*0.00*	66.164	*	*n/a*	n/a		0.15	3.794	
11. Sell livestock	*0.28*	1.147		*0.43*	1.694		*0.76*	0.538		*n/a*	n/a		0.72	0.127	
12. Buy on credit	*0.74*	0.601		*0.63*	2.557		*0.90*	1.053		*n/a*	n/a		0.98	0.038	
13. Collect wild plants	*0.37*	2.211		*0.38*	4.191		*39.41*	0.000		*n/a*	n/a		0.99	0.014	
14. Collect wild animals	*0.01*	6.829	*	*0.46*	1.560		*0.00*	12.149	*	*n/a*	n/a		0.53	0.396	
15. Harvest immature crops	*0.69*	0.735		*0.77*	1.814		*0.45*	3.698		*n/a*	n/a		0.01	10.467	*
16. Work for food	*0.14*	3.967		*0.22*	5.712		*0.06*	8.915	**	*n/a*	n/a		0.30	2.430	
Tercile ERA	*0.48*	1.461		*0.46*	3.620		*0.00*	23.937	*	*n/a*	n/a		0.24	2.820	
Tercile Total CSI	*0.04*	6.492	*	*0.00*	36.259	*	*n/a*	n/a		*n/a*	n/a		0.66	0.830	

* significant at 5% level, ** Significant at 10% level, ***Summed grown, donated or wild foods in 6 days, standardised to the median to devise a High/Low incidence for each HH

Table 2 Categorised household characteristics by categorised social capital, food security and donated food status. Pearsons Chi-squared test statistic given.

Table 3 AIDS Proxy	Low Soc. Cap	High Soc. Cap.	Total	Low Soc. Cap	High Soc. Cap.	Total	Pearson Chi-Squared		No Don. food	Don. food(s)	Total	No Don. food	Don. food(s)	Total	Pearson Chi-Squared	
	N Obs	N Obs		%	%				N Obs	N Obs		%	%			
No Orphan	100	91	191	52.4	47.6	100	3.855,		115	76	191	60.2	39.8	100	0.0431,	
Orphan(s)	24	39	63	38.1	61.9	100	p=0.049	*	37	26	63	58.7	41.3	100	p=0.835	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No Paternal Orphan	72	50	122	59.0	41.0	100	9.770,		81	41	122	66.4	33.6	100	4.192,	
Paternal Orphan(s)	52	80	132	39.4	60.6	100	p=0.002	*	71	61	132	53.8	46.2	100	p=0.041	*
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No Maternal Orphan	93	85	178	52.2	47.8	100	2.798,		108	70	178	60.7	39.3	100	0.1712,	
Maternal Orphan(s)	31	45	76	40.8	59.2	100	p=0.094	**	44	32	76	57.9	42.1	100	p=0.679	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No CI U60	67	65	132	50.8	49.2	100	0.413,		82	50	132	62.1	37.9	100	0.593,	
CI U 60	57	65	122	46.7	53.3	100	p=0.520		70	52	122	57.4	42.6	100	p=0.441	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No CI U60 FT	82	85	167	49.1	50.9	100	0.0156,		104	63	167	62.3	37.7	100	1.200,	
CI U 60 FT	42	45	87	48.3	51.7	100	p=0.09	**	48	39	87	55.2	44.8	100	p=0.273	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No Death U60	94	89	183	51.4	48.6	100	1.700,		108	75	183	59.0	41.0	100	0.1858,	
Death(s) U60	30	41	71	42.3	57.7	100	p=0.192		44	27	71	62.0	38.0	100	p=0.666	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
No Death U60 with CI	101	99	200	50.5	49.5	100	1.064,		108	75	183	59.0	41.0	100	0.278,	
Death(s) U60 with CI	23	31	54	42.6	57.4	100	p=0.302		44	27	71	62.0	38.0	100	p=0.598	
Total	124	130	254	48.8	51.2	100			152	102	254	59.8	40.2	100		
Not afflicted	38	30	68	55.9	44.1		1.854,		37	31	68	54.4	45.6		1.140,	
Afflicted	86	100	186	46.2	53.8		p=0.1732		115	71	186	61.8	38.2		p=0.286	
Total	124	130	254	48.8	51.2				152	102	254	59.8	40.2			

Table 3. Frequency distributions of AIDS proxies by household social capital status, and presence of donated food(s) in the 6 day HDDS. CI= chronic illness. FT=free treatment.

Logistic Regression Model					
	B	SE	Wald	Sig	AOR
Model 1 Odds of social capital level in the household affecting the log likelihood of having high or low ERR when controlling for HH Socio-Economic Status					
Soc. Cap. Score	-0.076	0.042	3.333	0.068	0.926
HH size	0.105	0.036	8.463	0.004	1.111
Total Income	0.000	0.000	2.734	0.098	1.000
Ave. Adult Edu.	-0.274	0.153	3.210	0.073	0.760
Model 2: Odds of social capital level in the household affecting the log likelihood of having high or low HDDS when controlling for HH Socio-Economic Status					
Soc. Cap. Score	0.104	0.043	5.877	0.015	1.110
HH Size	-0.019	0.035	0.294	0.588	0.981
Total Income	0.000	0.000	6.283	0.012	1.000
Ave. Adult Edu.	0.262	0.153	2.914	0.088	1.299

Table 4. Logistic regression outputs showing B coefficient, the Standard Error (SE), Wald Test Statistic and statistical significance, and Adjusted Odds Ratio (AOR).