Women's Autonomy, Women's Status and Nutrition in Zimbabwe, Zambia, and Malawi

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Abstract

There are several countries in Southern Africa that have been experiencing both a food crisis and an HIV epidemic. According to UNAIDS in 2002, it is estimated that 14.4 million people are at risk of starvation in Lesotho, Malawi, Mozambique, Swaziland, Zambia and Zimbabwe. This food crisis, which has been evolving since the 1992 southern African drought, has also been associated with high prevalence rates of HIV. In these countries, women have played a central role in food production for their households. Using data from the most recent Demographic and Health Surveys in Zimbabwe, Zambia and Malawi, the relationship between women's status and their own nutritional levels, measured by Chronic Energy Deficiency (CED), is explored. In Zambia and Malawi, women with less decision-making autonomy are more likely to have CED. There is no such association in Zimbabwe, where surveyed women have higher autonomy and a smaller proportion of all women have CED. In the most resource-constrained settings, women with less autonomy are at greater risk of compromised nutritional status which, in turn, may lead to loss of productive capacity, making them at greater risk of food insecurity for themselves and their households.

Introduction

There are several countries in Southern Africa that have been experiencing both a food crisis and an HIV epidemic. According to UNAIDS (UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance), it is estimated that 14.4 million people are at risk of starvation in Lesotho, Malawi, Mozambique, Swaziland, Zambia and Zimbabwe. This food crisis, which has been evolving since the 1992 Southern African drought, has also been associated with "alarmingly high prevalence rates" of HIV. While, in the past, households in these nations were able to cope with food crises through the production of food, earning cash from food produced, and relying on trading and bartering, HIV/AIDS, according to UNAIDS, has led to an erosion of coping mechanisms with food shortages. I hypothesize that in these highly constrained settings, women with low autonomy and status will be less likely to obtain adequate food resources and will then be more likely to experience undernutirion or Chronic Energy Deficiency (CED).

Defining a "resource-constrained" context

As of 2003, there are six countries suffering from both periodic food shortages the effects of high prevalence of HIV at the same time. These countries include Malawi, Zambia, and Zimbabwe. According to a Mission Report to the United Nations in 2003 (Morris & Lewis, 2003) there are three unique factors in the current food shortage in Southern Africa. In this most recent food emergency, the shortage was worsened by HIV/AIDS through the loss of productive working adults who can bring food to households, and, in particular, the loss of women who have been the main providers of food security in many of these households. In addition, many households have lost breadwinners and caregivers leaving households even poorer and more vulnerable to starvation, and therefore more vulnerable to HIV. This report also suggests that this trend toward crises in populations highly effected by HIV are likely to experience continued food crises (Morris et al., 2003).

In addition to the current food crisis, there has been a series of food shortages since the drought of 1992 (SADC FANR Vulnerability Assessment Committee, 2003). A report from the Southern African Development Community (SADC) on Malawi, Zambia and Zimbabwe finds that households affected by HIV (either through morbidity, mortality or high demographic load characterized by a high dependency ratio or the presence of orphans) has reduced agricultural production, non-farm income, and has led to lower levels of food security (SADC FANR Vulnerability Assessment Committee, 2003). At the same time, a recent report on African food security suggests that the food price index has soared and Zambia, Malawi and Zimbabwe are among countries in the worst shape (Rukuni, 2002). By the end of 2001, it was estimated that 33.7% of adults in Zimbabwe, 21.5% of adults in Zambia, and 15% of adults in Malawi were living with HIV/AIDS (SADC FANR Vulnerability Assessment Committee, 2003).

HIV and Nutritional Status

Since the onset of HIV epidemic, numerous studies have documented that one of the clinical problems associated with the disease is muscle wasting. Recent evidence, drawn from developed nations with access to antiretroviral therapies has documented a continued strong link between HIV and nutritional status. Several recent reviews have documented that malnutrition is a major complication of HIV and that malnutrition is associated with increased mortality, faster disease progression and decreased functional status (Grinspoon & Mulligan, 2003; Wanke et al., 2003; Salomon, De, & Melchior, 2002). These studies, in developed nations, note that while antiretroviral therapies are commonly administered, nutritional complications with HIV persist.

In the developing world, HIV and nutrition continue to be linked in the same way as was

seen in the early phases of the HIV epidemic in the developed world. In Malawi, a recent study of individuals admitted for tuberculosis, 80% had HIV. Among these patients, malnourishment, as measured by BMI (body mass index) was associated with mortality (Zachariah, Spielmann, Harries, & Salaniponi, 2002). Malnutrition was also prevalent among patients recruited in Burundi with food availability being the leading cause of malnutrition between HIV seronegative patients and tuberculosis being a leading cause of malnutrition among HIV seropositive patients (Niyongabo et al., 1999). In a context where HIV worsens nutritional status and food shortages increase the vulnerability to HIV, women's roles as food providers have become increasingly complex and difficult. According to the United Nations Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN, 2001), "at the social level, food insecurity is a major cause of vulnerability to HIV." (p.7) This operates through reduced agricultural production leading to increased difficulties for households. For example, women can be forced to trade sex for food or money, increasing their vulnerability to HIV.

Women's Autonomy and Anthropometry

Although women have tended to be producers for the family in many agricultural settings, their lack of access to the income from this labor leaves them resource-poor (Abbas, 1997). There has been some evidence to suggest that women who have lower levels of autonomy and status within in the household are more likely to experience undernutirion (Hindin, 2000) or have a lower BMI (Bindon & Vitzthum, 2002; Baqui, Arifeen, Amin, & Black, 1994). The theoretical rationale for why this may be the case is outlined in a paper on Zimbabwe by Hindin (2000) who suggests that women's health can be adversely affected if they are unable to negotiate for themselves, particularly in resource-constrained settings.

A combination of factors suggest that women with less autonomy and status will have poorer health, based on having a higher prevalence of CED. These factors include the fact that many households in these settings have been affected by the HIV/AIDS epidemics either directly, through loss of a family member or indirectly through the poor economic prospects in communities that have experienced substantial losses in the economically independent population. In addition, Malawi, Zambia and Zimbabwe have undergone a series of droughts that have led to poor food security throughout these nations. At the same time, gender norms in these countries often arise out of patrilineal and patrilocal practices that put women at a disadvantage when it comes to intrahousehold bargaining and resource allocation. In these highly resource-constrained settings, women with low autonomy will be less likely to obtain adequate food resources and may, in the long run, be at greater risk for contracting HIV/AIDS or having a more rapid progression of the disease if they have already contracted the virus. In addition, since women are the primary producers of food in these nations, the HIV/AIDS epidemic can compromise women's ability to devote as much time to food production due to additional care-giving responsibilities adding to indirectly to food insecurity in all constrained households.

Methods

Sample

Three Demographic and Health Surveys (DHS) were obtained from Measure/DHS for these analyses. The surveys are the 1999 Zimbabwe Demographic and Health Survey, the 2000 Malawi Demographic and Health Survey, and the 2001-2001 Zambia Demographic and Health Survey. Each of these surveys collected nationally-representative data on reproductive health issues from women ages 15-49. For the purposes of this paper, in each of the three countries, the sample

was limited to non-pregnant married or cohabiting women who had not given birth in the last three months. Since many of the key issues in this paper are focused on relationships, the sample needed to be limited to those women in partnerships. All women who reported being in a partnership at the time of the survey were included, however, a variable was created to determine whether or not the partner was co-residing at the time of the survey. Because there are a different set of nutritional guidelines and weight expectations for pregnant and lactating women, the sample was limited to women who were not currently pregnant or had recently given birth. These constraints led to a sample of 2,667 women in Zimbabwe, 3,485 women in Zambia, and 6,854 women in Malawi.

Dependent Variable

Chronic energy deficiency (CED) is based on an internationally derived standard. It is a dichotomous measure based on the standard BMI cutoff of <18.5 kg/m^2 (James, Ferro-Luzzi, & Waterlow, 1988)

Independent Variables

Measures of sociodemographic characteristics, women's and partners' characteristics. The sociodemographic characteristics of the sample are divided into two groups: household characteristics and women's characteristics. Urban residence is a dichotomous variable based on the woman's place of usual residence. Household wealth was calculated as a weighted sum of whether or not the household had the following items: electricity, radio, television, scooter, bicycle, cement floor, and flush toilet. The weights were calculated as the inverse of the proportion of households in the sample that had these items. The number of births the woman had was used as a dichotomous variable with women having no births compared to other women. Household size was left as a continuous measure of the number of individuals per household. Two additional sociodemographic measures were included to better describe the partnership. The first is whether or not the woman's partner was currently in the same household as she was at the time of the survey and the second measure was whether or not the partner was polygynous. Whether or not the woman was literate (excluded in the Zimbabwe analysis due to colinearity with education) and her current employment status at the time of the survey were included as dichotomous variables–however the woman's occupation was used instead of current employment status. Women's ages were used as continuous measures. Education (for both the respondent and her partner) was coded in four levels: no schooling, some primary school, completed primary school, and began secondary school or more. Occupation was divided into six categories: unemployed, working in agriculture, unskilled manual, skilled manual, non-manual, and professional. Since few women were in skilled manual jobs, for modeling, the skilled and unskilled manual laborers were combined. Partners' characteristics include their age, education, and occupation. In Zambia, women were asked if they were ever physically abused by their spouses and this variable was included in the Zambian analyses.

Measures of Women's Relative Status, Women's Status in Society, and Decision-Making Autonomy

Women's Relative Status. Women's relative status is conceptualized as their status relative to their partner's status in terms of age, education and occupation. For age, three categories were used based on the continuous measures of age: (1) respondents were four or more years older than their partners, (2) respondents were six or more years younger than their partners, or (3) everyone else who was near the same age as their partners. For education, four levels were used including for both respondents and their partners: no schooling, some primary school, completed primary school, or

attended some secondary school or more. Relative educational status was calculated as a difference between the partners' schooling levels with three categories: Respondent has more, the couple has same level, or the partner has more. For occupation, six levels were used for the respondents and their partners: not working, agricultural, unskilled manual, skilled manual, non-manual and professional. A relative occupational difference was calculated using five categories: both unemployed, both in agriculture, respondent at a higher level, couple at equal levels, and partner at a higher level. In Malawi, no women reported that their partners were unemployed, so there is no category for "both unemployed." Few women in all three countries were in unskilled manual labor, so unskilled and skilled manual were combined for the multivariate analyses.

Women's Status in Society. In each of the surveys, women were asked about their attitudes toward wife beating: "Sometimes a husband is annoyed or angered by things which his wife does. In your opinion, is a husband justified in beating his wife in the following situations:

- If she goes out without telling him?
- If she neglects the children?
- If she argues with him?
- If she refuses sex with him?
- If she burns the food?

From these dichotomous variables (yes/no), an index was created based on whether women think it is justified for a husband to beat his wife, under any of the circumstances. This variable is used as a proxy to measure women's status or lack thereof (self-perceived) within each of the three countries.

Measures of Decision Making. Depending on the survey, a different set of domains were included in terms of decision making. The domains included for the Zimbabwean women are based on a series of four questions about who makes the decisions. In Zimbabwe and Malawi, women were asked "Who in your family usually has the final say on the following decisions?"

- Your own health
- Large household purchases
- Daily household purchases
- Visits to family, friends, or relatives
- Food to be cooked each day

In Malawi, an additional domain was included:

- Number of children and when

In Zambia, the domains included:

- Your own health care
- Large household purchases
- Visits to family, friends, or relatives
- Number of children and when

For each of these questions, the women were given the following response options: (1) themselves (respondent), (2) husband/partner, (3) respondent and husband/partner jointly, (4) someone else, and (5) respondent and someone else jointly. A set of dichotomous variables was created for each of the decision-making domains to reflect patterns of decision-making. For each domain, the

variable was coded as 1 if the woman had final say over that decision alone and 0 if the woman did not have final say alone. A similar set of dichotomous variables was created for each domain based on whether or not the partner had final say in the decision or whether the final decision was made jointly. From the sets of dichotomous variables, indices were created to show the number of domains in which women or their partners had the final say or whether final say was made jointly. As the goal of these indices is to represent a range of domains, it was anticipated that alpha coefficients, showing the inter-item correlations, would be moderate–around 0.70. In Zimbabwe, the decision-making indices had alpha coefficients as follows: for respondent having the final say (Chronbach's alpha=0.58), partner having the final say (Chronbach's alpha=0.65), and joint final say (Chronbach's alpha=0.67). In Zambia, the decision-making indices had alpha coefficients as follows: for respondent having the final say (Chronbach's alpha=0.50), partner having the final say (Chronbach's alpha=0.74), and joint final say (Chronbach's alpha=0.73). In Malawi, the decision-making indices had alpha coefficients as follows: for respondent having the final say (Chronbach's alpha=0.70), partner having the final say (Chronbach's alpha=0.76), and joint final say (Chronbach's alpha=0.71).

Statistical Analyses

The analyses were completed in four parts. First, a description of the study population and its sociodemographic measures, women's status and decision-making autonomy are provided for each country. Using ordered logistic regression, possible confounders of the relationship between CED and decision-making autonomy are tested by modeling the associations between decision-making and the sociodemographics, woman's characteristics, women's relative status and women's status in society. Bivariate associations with CED are explored using cross-tabulations, and multivariate logistic regression is used to explore associations with adjustment for confounders.

Results

Table 1 describes the overall prevalence of the sociodemographic characteristics, women's characteristics, partner's characteristics, couple characteristics, and women's relative status, women's status in society and women's autonomy in household decision-making. In Zimbabwe, the percentage of women with CED is 4.6, in Zambia, the percentage of women with CED is 13.9, and in Malawi, it is 6.8. Some characteristics are quite similar across the three countries with all being predominately rural (70-80%), most women having had at least one birth (94-95%) and polygyny confined to a minority of households (approximately 16%). More than 50% of the women report currently working at the time of the surveys, with most employed in agriccultural jobs on their own land. The mean age of the samples ranges between 31-32 years old. Malawi has the largest number of people per households with 6.3, Zimbabwe has 6.2, and Zambia has 5.5 people in the average household. Malawi has some of the lowest indicators for women with the lowest literacy rate and the highest percentage of women and men who did not attend any formal schooling. In Zimbabwe, 29% of women reported that their partner was not living with them, in contrast to 13% in Malawi and 6% in Zambia. Whether or not the partner lives in the household can have an important relationship with both the availability of food resources and women's autonomy in decisions.

In terms of women's relative status, in each of the three countries, few women (approximately 1%) are older than their partners (by more than four years), in Zimbabwe and Zambia, most partners are more than six years older than their wives, and in Malawi, most couples are the same age. In all three countries, women and men attain about the same level of education or

men have more education than their partners. In Zimbabwe, 17% of women have a higher status job than their partners as compared to 12% in Zambia and 4% in Malawi.

The patterns of household decision making are shown in Figure 1. In Zimbabwe, women have substantially more autonomy than in either of the other two countries. Although the decision-making domains vary by country, a general pattern emerges. In Zimbabwe, men have the most final say over large household purchases and women's own health care, but even in these domains, men have the final say less than half the time. Women have more final say than their partners over their own health care, household purchases, and what food to cook. The decisions concerning large household purchases and visiting relatives are primarily made jointly. In Zambia, men have the final say more than half time in all four domains asked. Three of the four decisions are more often made jointly than by the respondent alone, but more women have the final say over their health care. Malawi has the most male-dominated decision-making pattern with men having the final say more than half the time in decisions about health care, large household purchases, and other household purchases. In terms of women's status in society, 88% of women in Zambia, 54% of women in Zimbabwe, and 36% of women in Malawi believe it is OK for husbands to beat their wives in at least one of the five domains posed in the questionnaire (data not shown).

Factors Associated with Decision-Making Autonomy

Tables 2-4 display the results of ordered multivariate logistic regressions with each of the three decision-making autonomy indices as outcomes, and sociodemographics, women's characteristics, women's relative status and their status in society as independent variables for each country. For each country, three separate models are run. Net of the other factors in the models, many of the same factors are associated with decision-making autonomy across the three countries. Among the sociodemographic characteristics, urban residence, having a partner living at home, and having a polygynous partner are all associated with decision-making autonomy. In all three countries, urban women report that their partners have the final say in fewer decisions, and in Zambia and Malawi, urban residence is associated with more decisions where the woman has final say. In all three countries, having the partner living in the same household as the woman is associated with fewer decisions being made by the women, and more decisions being made by the partner. In both Zimbabwe and Malawi, the presence of a male partner is associated with more joint final say. Polygynous men have more final say in Zimbabwe and Malawi, and in all three countries, polygynous households have fewer decisions made jointly. Higher levels of household wealth are associated with more joint decision-making and less decision making by the women alone, and in Zambia women in larger households make fewer final household decisions alone.

In terms of woman's characteristics, while age is a consistent factor associated with decision-making in all three countries. Older women report having the final say alone in more decisions, and younger women report more decisions being made by their partners alone. In Malawi, older women also report more jointly made decisions. In Zimbabwe, more educated women report having the final say in fewer decisions, but more joint decisions. In Zambia and Malawi, more educated women report having more final say in decisions and report that their partners have the final say in fewer of the decisions. In Zimbabwe, women employed in non-manual and professional occupations have the final say in more domains as compared to unemployed women, and professional women report that their partners have the final say in fewer domains. In Zambia, as compared to unemployed women, women in nearly all occupations have the final say in more decisions, and report that their partners have the final say in fewer decisions. In Malawi, there is a general trend toward employed women having the final say in more domains, and it is clear that

women's employment is inversely related to partners having the final say in more domains. Employed women in Malawi also report more decisions being made jointly.

Few of the relative status variables are statistically significant in these models, after controlling for the sociodemographic characteristics, women's characteristics, and women's status in society. In Zimbabwe, the only significant result is that when both women and their partners work in agriculture, they make more joint decisions. In Zambia and Malawi, women who have more education than their partners make more decisions, and in Malawi, women with more education than their partners have partners who make fewer decisions. In Zambia, women who are more than four years older than their partners make more decisions jointly and fewer decisions are made by their partners. In terms of relative occupational status, women who report having a higher level of education than their partners also make fewer decisions on their own or jointly, and have partners who make more decisions. When the partners have a higher level of education, women make fewer of the decisions, and more decisions are made by the partner, himself. In Malawi, couples whose members are both in agriculture made fewer decisions jointly as compared to couples at the same occupational level. In all three countries, women's status in society, approximated by a higher number of domains in which women feel wife beating is justified, the fewer decisions that are made jointly. In all three countries, women's attitudes towards wife beating are related to household decision-making. In Zimbabwe and Zambia, women who find wife beating justified are more likely to report that their husbands have the final say in more household decisions. In Malawi, women who find wife beating justifiable have the final say themselves in more household decisions.

Factors Associated with CED

Sociodemographic characteristics and women's and partner's characteristics.

In Table 5, the unadjusted associations with CED are explored using cross-tabulations and chi-squared tests. In Zambia and Malawi, more rural women have CED than urban women. In Zambia, fewer nuliparous women have CED than women who have at least one birth. In both Zambia and Malawi, fewer literate women have CED than non-literate women, and fewer women with more education have CED. In Zambia, more women in agricultural work have CED than women in other occupations or unemployed women. More women with partners who have more education have CED in Zambia and Malawi, and in Zambia, fewer women with partners employed in occupations other than agriculture have CED.

Women's Relative Status, Women's Status in Society, and Decision-Making Autonomy.

Women in couples who are the same age in Zambia and Malawi have more CED than couples where one partner is older. Based on the findings concerning the association between CED and agricultural work in Zambia, it is not surprising to note that when both members of the couple are employed in agriculture, more women also have CED. Decision-making is most associated with CED in Malawi, where the trend suggests that more women with partners who make more decisions have CED. Some individual measures of women's attitudes toward wife-beating are associated with CED in Zambia and Malawi and fewer women who report ever being beaten by their partners have CED in Zambia. Since Zambia has the only survey which includes this question, it was eliminated from the final set of models in order to make the analyses more parallel.

Mutlivariable Regression of CED

For each country, four models were run for CED using logistic regression. Modeling was done in a block fashion, where the first model includes only sociodemographic and woman's

characteristics, the second model adds couple characteristics and women's relative status, the third model adds women's status in society and woman and joint final say in decision-making, and the fourth model adds partner final say in decision-making and removes woman and joint final say. Since the variables did not substantially change in the presence of other blocks, the final models, with all the variable blocks included, are presented for each country (Table 6). The association of variables in isolation can be seen in Table 5, while the multivariate models adjust for other factors, recognizing that some constructs are measured be several factors. For example, the construct of women's educational status can be measured by both schooling completion and literacy. These models have a smaller sample size than described earlier due to missing values in several variables.

In terms of sociodemographics, none of the factors are significantly associated with CED in Zimbabwe. In Zambia, fewer women from larger households have CED, and the trend is the same in Malawi. In Malawi, fewer urban women have CED than rural women. In terms of the woman's characteristics, there are no significant associations in Malawi. Age is associated with CED in both Zimbabwe and Zambia. In Zimbabwe, more younger women have CED while in Zambia, more older women have CED. Higher levels of education are associated with lower rates of CED in both Zimbabwe and Zambia, after controlling for the other variables presented in the models. In Zimbabwe, more women in a professional occupation have CED, which is a trend seen in Table 5. This counterintuitive result may be a product of small sample sizes or other factors, possibly body image, that determine why women are in a professional occupation.

Some of the women's relative status variables are associated with CED. In both Zambia and Malawi, women who are with a partner who is at least six years older are less likely to have CED, as compared to women who have partners that are the same age. In Zimbabwe, as compared to couples who have the same level of education, when either member of the couple has more education, fewer women have CED. In contrast, in Zambia, more women who have higher levels of education than their partners have CED. This trend was also seen in the bivariate associations shown in Table5. In terms of women's status in society, or lack thereof, more women who feel that wife-beating is justified in more domains, are *less* likely to have CED though this result does not attain significance at the $p<0.05$ level. Bivariate associations show the same trend (OR=0.89, p=0.15). This surprising result may have to do with how widely accepted wife-beating is in Zimbabwe, and that it reflects gender norms which tolerate violence towards women{Hindin 2003 73 /id}.

Patterns of decision-making autonomy are similar in Zambia and Malawi. In both Zambia and Malawi, the more domains in which partners have the final say, the increased risk of CED in women. In Zambia, this result is statistically significant before multivariate adjustment (OR=1.12, p=0.01--data not shown) but becomes attenuated (OR=1.08, p=0.054) with the presence of the factors in the model. In Malawi, the trend is that the more joint decisions made by the couple, the less likely the woman is to have CED.

Figure 2 is designed to further explore the relationship between decision-making autonomy and CED. In both Panels A and B, there is a small but interesting group where partners make no final decisions and women make all the final decisions. Each panel in the figure presents the percentage of women who have CED by their reported decision-making pattern, with a separate panel for the number of decisions made by either member of the couple (Panels A and B) and decisions made jointly (Panel C). In addition, the markers for the lines (squares in Malawi, circles in Zambia, and triangles in Zimbabwe) vary in size depending on how many people report making a certain number of the decisions. For example, if 1000 women in Malawi reported that they made one decision jointly with their partner, the square is bigger as compared to if only 100 women

reported making the decisions jointly. In addition, 95% confidence intervals are used to show the errors around the estimates of CED. While the percentages reported are not adjusted for confounders, it should be noted that the findings displayed, when run in logistic regression, do not vary substantially with and without multivariate adjustment.

In Panel A, the percentage of women with CED is shown by reported decision-making by the partner. In all three countries, starting with the first decision made by the partner, women are higher risk of CED. However, when women report that their partners have the final say in none of the decisions, women are more likely to have CED. This pattern needs to be interpreted with caution, since the proportion of women who report that their partners have no final say is relatively small, except in Zimbabwe and the percent difference is small. Despite the small sample of women who report that their partners do not have the final say in any of the decisions, when this point is modeled separately from the linear trend in Malawi, the odds of having CED if the husband makes none of the decisions is 2.23 ($p<0.01$) while the significance and magnitude of the linear trend without the point increases the adjusted odds of having CED from 1.07 ($p<0.05$) (Table 6) to an adjusted odds of 1.16 ($p<0.001$). These differences in the significance and magnitude suggest that this group, where partners have none of the final say in Malawi is a different group than the others. Panel B shows a similar pattern whereby when women report having the final say in all decisions, they are at an increased risk of having CED. (This group of women, who have all the final say in decisions, is the same group of women who report that their partners have none of the final say). If this point is modeled separately from the linear trend, women who have the final say in all six decisions in Malawi are 1.76 ($p<0.001$) times more likely to have CED and the linear trend without these women increases the adjusted odds of having CED from 0.94 ($p>0.10$) (Table 6) to 0.86 ($p<0.01$). These results suggest that women who have the highest level of autonomy are the worst off–even compared to women who have no final say in any of the decisions. Panel C shows the relationship between joint decision-making and CED in all three countries. While there is some evidence of a U-shape between joint decision-making and CED in Zambia and Malawi, the upward trend in CED with more joint decisions is not statistically significant.

Discussion

The three countries studied have experienced not only the devastation of the HIV epidemic, but the difficulties associated with chronic droughts and food shortages. This paper has shown that some of these difficulties may be affecting households and women's health. Although levels of CED are not as high as one might expect, some women are experiencing undernutirion that could be caused by either food shortages or illness related to HIV. For women in Zambia and Malawi, there is a relationship between patterns of household decision-making and their nutritional well-being. In both of these countries, women who live with partners who have more decision-making autonomy are also more likely to have CED. However, a different pattern emerges when women either have all the final say or partners have none of the final say–a situation which may mark households where partners contribute little to the household. More women who have the final say in all decisions (or who have partners who make none of the decisions) have CED than would be expected, and this group is statistically significantly different from what would be expected in Malawi. Further exploration is needed to see if this trend is true in other countries outside those in this region as this group has may have important implications for women's empowerment. It is possible that women who have so much control are in a situation where they are forced to make all the decisions because their partner is no longer a functioning part of the household. Several other studies document that women's autonomy is associated with poorer outcomes for women, in

particular, more autonomous women may experience more interpersonal violence (Jewkes, 2002; Koenig, Ahmed, Hossain, & Khorshed Alam Mozumder, 2003; Hindin & Adair, 2002). These studies point out that the context for women's status and autonomy makes a difference and that when women behave in a manner opposite traditional gender roles, their well-being may be at greater risk. In the three countries in this study, women may be at risk for greater conflict and less negotiation power if they are more autonomous, given the historical levels of patriarchy in these countries. In addition, women may not be able to fulfill their traditional roles as food producers, due to both droughts and HIV, which, in turn, leads to greater food insecurity for themselves and their households.

The results, or lack thereof, in Zimbabwe generally support the hypothesis that women will be at greatest risk for CED in resource-constrained settings where they have little status and autonomy. Zimbabwean women have substantially more decision-making autonomy than do the women in Zambia and Malawi. In addition, the women surveyed in Zimbabwe appear to be the least resource constrained of the three countries (as would be expected from many markers of economic development). For example Zimbabwe includes the most educated women of the three samples. While the results of a similar analysis in Zimbabwe by Hindin (2000) showed a small but significant association between women's decision-making autonomy and CED, the present study did not find these results. On one hand, this is surprising since Zimbabwe has some of the highest prevalence rates of HIV, and a political situation that has become increasingly difficult, as well as the same drought as the other two nations in this study. However, just 4.8% of the women surveyed could be defined as having chronic energy deficiency, and, in fact, a larger proportion of women were obese in Zimbabwe in 1999 (9%) than were experiencing CED. The gradient of stronger associations in poorer countries supports the central hypothesis of this paper. Women who live in the most constrained settings, and who have lower levels of autonomy than their partners, are most likely to also have CED.

Several other important results emerged in this three-country comparison. One of the most striking results is that women in Zimbabwe have substantially more final say in household decisions than do women in Zambia or Malawi. Among the most significantly associated factors with decision-making autonomy are age and occupation. In all three countries older women and women with higher status jobs, have more decision-making autonomy. Older women are less likely to make joint decisions. In all three countries, women with this high status jobs are less likely to have their partners having the final say in decisions by themselves, and in Malawi and Zambia, professional women are more likely to make decisions jointly. While a recent paper has noted that alarmingly high levels of women who report that they find wife-beating acceptable in Zimbabwe (Hindin, 2003), the levels of acceptance of wife beating are just as high in Zambia. In all three countries, making joint decisions is inversely associated with attitudes toward wife-beating whereby women who report more joint decisions also report that they think wife beating is justified in fewer domains.

While there is support for the central hypothesis of this paper, there are some important limitations to these results. The data are cross-sectional so the direction of the relationship between women's autonomy and CED is unclear. While most would argue that women with limited bargaining power in the household would not be able to negotiate for themselves well enough, it is also possible that women who began their marriages or relationships with a higher BMI were also better negotiators in household decisions. Conversely women who had lower BMIs at the start of the marriage or partnership may also have been poorer bargainers. In addition, while the observed relationship between CED and decision-making has been found in

two of the countries, the relationship observed could be due to a third factor that was unmeasured. While a design comparing the 1994 and 1999 Zimbabwe DHS surveys was considered, the measures of women's decision-making autonomy were different–both in terms of domains and in terms of the way the questions were asked (in 1994 joint final say was not an option and low autonomy was measured as the number of domains in which women had no say). Although Hindin (2000) found that more women with no say in household decisions had CED, the data available were different. In fact, in an attempt to create a similar measure of decision-making as the one used in the 1999 Zimbabwe DHS with the 1994 data, it was found that only the decision about whether the woman can work outside the home was significantly associated with a lower BMI but not CED. This domain was not included in the 1999 Zimbabwe DHS, making a direct comparison impossible. The other two measures, reconceptualized to match the 1999 DHS were not significant anymore.

Despite the limitations of this study, there are some important results worthy of policy maker and public health attention. If the women in this study with CED are not already infected with HIV, they are more likely to be susceptible given their need to provide food security through any means possible, including such avenues as sex work. In addition, with the recent food shortages and droughts, women in rural households could be even more essential as they are the primary providers of food for the household. HIV/AIDS in these settings will prevent women from caring out this primary role under two scenarios. First, if the women are infected themselves, they may experience muscle wasting and loss of physical strength rendering them less able to tend to the crops leading to food insecurity for themselves and their families. Second, if women need to care for family and household members who are ill due to HIV/AIDS, they will have less of an opportunity to adequately farm and produce food for themselves and their households. These factors taken together put women and their families at substantial risk of food insecurity with women who are unable to contribute to household decisions with their partners least able to minimize this risk.

Table 1: Percent distribution of variables in Zimbabwe, Zambia and Malawi

	Zimbabwe	Zambia	Malawi
Overall	(N=2667)	(N=3485)	(N=6854)
CED			
No	95.4	86.1	93.2
Yes	4.6	13.9	6.8
Sociodemographic Characteristics			
Residence			
Rural	72.0	69.7	79.9
Urban	28.0	30.3	20.1
Household Wealth, Range	0-128.0	0-174.1	0-130
Mean (SD)	7.7 (12.6)	6.9 (14.3)	7.1 (13.8)
Number of Births			
None	6.2	5.5	6.3
One or more	93.8	95.5	93.7
Household Size , Range	1-20	1-26	1-21
Mean (SD)	5.6 (2.7)	6.3 (2.9)	5.3 (2.4)
Husband/Partner Living in Household			
No	28.7	6.2	12.9
Yes	71.3	93.8	87.1
Husband/Partner is Polygynous			
No	84.3	82.9	82.6
Yes	15.7	17.1	17.4
Woman's Characteristics			
Literate			
No	26.0	43.5	48.6
Yes	74.0	56.5	51.4
Currently Working			
No	45.6	35.4	38.8
Yes	54.4	64.6	61.2
Age, Range	15-49	15-49	15-49
Mean (SD)	31.6 (8.7)	30.9 (8.8)	30.7 (8.9)
Education Level			
None	10.7	15.9	34.2
Some Primary	25.3	42.2	43.5
Completed Primary	24.3	20.6	7.5
Secondary or More	39.6	21.4	16.5
Occupation			
Not Working	41.5	35.4	41.2
In Agriculture	27.1	41.3	51.3
Unskilled/Skilled Manual	8.7	3.5	3.6
Non-Manual	17.9	17.5	1.4
Professional	4.8	2.3	2.5
Husband's/Partner's Characteristics			

Age, Range	17-88	17-87	16-85
Mean (SD)	36.4 (11.7)	38.0 (11.4)	37.0 (10.6)
Education Level			
None	6.3	8.5	15.3
Some Primary	19.7	25.3	36.5
Finished Primary	23.4	25.2	9.2
Secondary or More	50.6	41.0	38.9
Occupation			
Not Working	3.6	2.5	0.0
In Agriculture	19.8	55.4	59.2
Unskilled Manual	13.2	0.7	0.7
Skilled Manual	19.2	15.9	21.6
Non-Manual	24.3	18.9	26.0
Professional	36.5	6.6	6.9
Couple Characteristics/Women's Relative Status			
Age Difference between Partners			
Woman Older by 4 years or more	1.3	0.9	1.2
Same Age (woman<4 years older, partner<6 years older)	45.3	44.8	52.4
Partner Older by 6 years or more	53.4	54.4	46.4
Education Level Difference between Partners			
Woman More	15.3	11.4	10.1
Same Level	51.4	41.9	47.0
Partner More	33.3	46.7	42.9
Occupational Type Difference between Partners			
Both Unemployed	7.5	1.3	--
Both in Agriculture	12.0	48.5	40.9
Woman Higher	16.7	11.5	3.6
Same Level	11.3	9.0	2.8
Partner Higher	52.2	42.5	52.7
Woman Ever Beaten by Partner			
No		58.1	
Yes		41.9	
Autonomy in Decision-Making			
Final Say over Healthcare			
Partner	31.1	52.0	69.7
Joint	13.2	13.0	7.5
Woman	55.7	35.0	22.8
Final Say over Large Purchases			
Partner	35.7	61.7	80.7
Joint	46.4	26.9	12.5
Woman	17.9	11.3	6.7
Final Say over What to Cook			
Partner	3.0	N/A	64.4
Joint	5.8		13.3
Woman	91.2		22.3

Final Say over Household Purchases			
Partner	15.7	N/A	40.3
Joint	21.7		10.8
Woman	62.6		48.9
Final Say over Visiting Relatives			
Partner	20.4	55.3	36.0
Joint	46.1	28.0	45.0
Woman	33.5	16.7	19.0
Final Say Over # of Children and When			
Partner	N/A	51.1	43.7
Joint		39.1	47.1
Woman		9.8	9.2
Respondent Decision Making Index, Range	0-5	0-4	0-6
Mean (SD)	2.6 (1.3)	0.7 (0.9)	1.3 (1.5)
Joint Decision Making Index, Range	0-5	0-4	0-6
Mean (SD)	1.4 (1.3)	1.1 (1.3)	3.4 (1.9)
Partner Decision Making Index ,Range	0-5	0-4	0-6
Mean (SD)	1.0 (1.3)	2.2 (1.5)	2.9 (1.6)
Women's Status in Society			
OK to Beat Wife if she goes out without permission			
No	70.6	17.6	82.4
Yes	29.4	82.4	17.6
OK to Beat Wife if she neglects the children			
No	67.0	36.2	77.7
Yes	33.0	63.8	22.3
OK to Beat Wife if she argues with her spouse			
No	64.2	43.5	80.6
Yes	35.8	56.5	19.4
OK to Beat Wife if she refuses to have sex			
No	73.6	47.5	81.1
Yes	26.4	52.5	18.1
OK to Beat Wife if she burns the food			
No	87.2	52.2	83.2
Yes	12.8	47.8	16.6
Wife beating index, 0-5, Mean (S.D.)	1.4 (1.6)	3.0 (1.8)	0.9 (1.5)

N/A: Data not available

Table 2: Multivariate ordered logistic regression of factors associated with decision-making autonomy in Zimbabwe (odds ratios)

	# of decisions where respondent has final say	# of decisions where partner has final say	# of decisions where final say is jointly made
Sociodemographics			
Urban Residence	1.22+	0.71**	1.22+
Household Wealth	1.00	1.00	1.00
Had at least one Birth	1.23	0.90	1.01
Household Size	0.94	1.01	1.03+
Partner is at Home	0.32***	1.76***	1.71***
Partner is Polygynous	1.1.4	1.54***	0.50***
Woman's Characteristics			
Women's Age (years)	1.02***	0.98***	1.00
Women's Education Level			
None (comparison)	1.00	1.00	1.00
Some Primary	0.85	0.97	1.29
Completed Primary	0.69*	1.07	1.52*
Secondary or More	0.78	0.96	1.52*
Women's Employment			
Not Working (comparison)	1.00	1.00	1.00
In Agriculture	1.13	1.00	0.94
Unskilled	1.46	0.67	1.11
Skilled Manual	1.08	0.82	1.07
Non-Manual	1.56*	0.84	0.87
Professional	1.69*	0.40***	1.24
Woman's Relative Status			
Age Difference			
Woman Older	1.08	1.01	1.04
Same Age (comparison)	1.00	1.00	1.00
Partner Older	0.98	1.12	0.87
Education Level Difference			
Woman More	1.10	0.82	1.04
Same Level (comparison)	1.00	1.00	1.00
Partner More	1.03	0.96	1.04
Occupational Level			
Both Unemployed	0.76	1.21	0.90
Both in Agriculture	0.81	0.74+	1.65***
Woman Higher	0.73+	1.25	1.02
Same Level (comparison)	1.00	1.00	1.00
Partner Higher	0.71+	1.09	1.09
Women's Status in Society			
# of domains where wife-beating is justified	1.03	1.11***	0.89***
N	1872	1872	1872

***P<0.001; **P<0.01; *P<0.05, P<0.10

Table 3: Multivariate ordered logistic regression of factors associated with decision-making autonomy in Zambia (odds ratios)

	# of decisions where respondent has final say	# of decisions where partner has final say	# of decisions where final say is jointly made
Sociodemographics			
Urban Residence	1.03***	0.69***	1.06
Household Wealth	1.00	1.00	1.00
Had at least one Birth	1.12	1.02	1.09
Household Size	0.96***	1.00	1.01
Partner is at Home	0.38***	1.89***	1.26
Partner is Polygynous	1.00	1.39***	0.66***
Woman's Characteristics			
Women's Age (years)	1.02***	0.99**	1.00
Literate	0.87	1.02	1.13
Women's Education Level			
None (comparison)	1.00	1.00	1.00
Some Primary	0.83	1.17	0.94
Completed Primary	0.81	1.38*	0.84
Secondary or More	0.96	0.86	1.36+
Women's Employment			
Not Working (comparison)	1.00	1.00	1.00
In Agriculture	2.45***	0.61**	1.03
Unskilled Manual	0.52	0.48	2.05
Skilled Manual	2.67***	0.48**	1.19
Non-Manual	3.28***	0.34***	1.27
Professional	4.55***	0.14***	2.89***
Woman's Relative Status			
Age Difference			
Woman Older	1.22	0.84*	1.23**
Same Age (comparison)	1.00	1.00	1.00
Partner Older	1.03	0.69	1.39
Education Level Difference			
Woman More	1.48**	0.95	0.78+
Same Level (comparison)	1.00	1.00	1.00
Partner More	1.00	0.98	1.01
Occupational Level			
Both Unemployed	1.10	1.39	0.48+
Both in Agriculture	0.75+	1.05	1.19
Woman Higher	0.52**	1.26***	0.59*
Same Level (comparison)	1.00	1.00	1.00
Partner Higher	0.50**	2.45***	0.76
Women's Status in Society			
# of domains where wife-beating is justified	0.97	1.10***	0.91***
N	2663	2663	2663

***P<0.001; **P<0.01; *P<0.05, +P<.10

Table 4: Multivariate ordered regression of factors associated with decision-making autonomy in Malawi (Odds Ratios)

	# of decisions where respondent has final say	# of decisions where partner has final say	# of decisions where final say is jointly made
Sociodemographics			
Urban Residence	1.20*	0.66***	1.66***
Household Wealth	0.99***	1.00	1.01*
Had at least one Birth	1.00	1.07	0.96
Household Size	1.00	1.01	0.97+
Partner is at Home	0.29***	2.03***	1.72***
Partner is Polygynous	1.44***	0.89+	0.75***
Woman's Characteristics			
Women's Age (years)	1.01***	0.98***	1.01*
Literate	0.81*	0.96	1.29**
Women's Education Level			
None	1.00	1.00	1.00
Some Primary	1.65***	0.73***	0.99
Completed Primary	2.58***	0.55***	0.96
Secondary or More (comparison)	3.42***	0.21***	1.08
Women's Employment			
Not Working (comparison)	1.00	1.00	1.00
In Agriculture	1.40***	0.72***	1.19*
Unskilled/Skilled Manual	1.29	0.59*	1.62+
Non-Manual	1.98*	0.21***	2.71**
Professional	1.21	0.15***	5.77***
Woman's Relative Status			
Age Difference			
Woman Older	1.25	1.06	0.74
Same Age (comparison)	1.00	1.00	1.00
Partner Older	1.13*	1.00	0.92
Education Level Difference			
Woman More	1.33***	0.83**	1.01
Same Level (comparison)	1.00	1.00	1.00
Partner More	0.92	1.22*	0.84*
Occupational Level			
Both in Agriculture	1.01	1.15+	0.76**
Woman Higher	1.32	1.09	0.68
Same Level (comparison)	1.00	1.00	1.00
Partner Higher	1.00	0.86	1.06
Women's Status in Society			
# of domains where wife-beating is justified	1.04*	1.01	0.95*
N	4333	4333	4333

***P<0.001; **P<0.01; *P<0.05, p<0.10

Table 5: Percent Distribution of variables and associations with Chronic Energy Deficiency (CED)

	Zimbabwe	Zambia	Malawi
Sociodemographic Characteristics			
Residence			
Rural	5.2	15.7***	7.3***
Urban	3.2	9.9	4.6
Number of Births			
None	5.1+	12.1*	7.4
One or more	3.8	14.0	6.7
Partner/Partner Living in Household			
No	4.7	16.7	7.3
Yes	4.6	13.7	6.7
Partner/Partner is Polygynous			
No	4.7	13.5	6.5
Yes	4.1	16.0	7.8
Woman's Characteristics			
Literate			
No	6.1	16.1***	7.5*
Yes	5.0	12.2	6.0
Currently Working			
No	4.8	6.5	7.0
Yes	4.4	6.5	6.6
Education Level			
None	5.2	20.5***	7.4**
Some Primary	4.6	16.7	7.0
Completed Primary	5.9	14.4	7.6
Secondary or More	3.7	10.3	4.3
Occupation			
Not Working	4.8	13.7***	7.1
In Agriculture	4.2	17.3	7.2
Unskilled Manual/Skilled Manual	4.2	13.7	7.7
Non-Manual	4.0	8.1	2.5
Professional	8.6	3.8	5.4
Partner's Characteristics			
Education Level			
None	4.8	20.5***	7.7*
Some Primary	3.7	16.8	8.0
Completed Primary	5.5	14.4	6.7
Secondary or More	4.5	10.3	5.3

Occupation			
Not Working	4.0	11.7***	N/A
In Agriculture	4.6	17.4	7.8
Unskilled Manual	5.6	4.3	5.4
Skilled Manual	4.5	8.9	6.1
Non-Manual	4.5	10.7	6.6
Professional	4.6	7.9	5.1
Couple Characteristics/Women's Relative Status			
Age Difference between Partners			
Woman Older	5.9	12.1**	5.0*
Same Age (+/- 2 years)	5.0	18.9	7.5
Partner Older	4.1	13.3	5.9
Education Level Difference between Partners			
Woman More	2.7	17.0	7.0
Same Level	5.2	13.4	7.0
Partner More	4.6	13.6	7.0
Occupational Type Difference between Partners			
Both Unemployed	6.7	9.3***	N/A
Both in Agriculture	4.0	18.1	7.7
Woman Higher	4.8	8.4	6.3
Same Level	5.2	9.6	6.6
Partner Higher	3.7	13.2	7.2
Woman Ever Beaten By Partner			
No	NA	15.3+	NA
Yes		13.1	
Autonomy in Decision-Making			
Final Say over Healthcare			
Partner	5.3	14.1	7.1+
Joint	5.0	13.9	5.5
Woman	4.6	13.0	5.8
Final Say Over Household Purchases		N/A	
Partner	3.5		7.2*
Joint	5.0		6.1
Woman	5.3		5.5
Final Say over Large Purchases			
Partner	4.4	15.4*	7.0
Joint	5.1	11.7	5.3
Woman	5.2	12.1	6.2
Final Say over What to Cook			
Partner	2.6	NA	8.1***
Joint	4.7		7.0
Woman	4.6		5.6
Final Say over Visiting Relatives			
Partner	4.9	14.5	7.2
Joint	4.7	12.3	6.2
Woman	5.7	13.9	7.1

Final Say over # of Children and When			
Partner	N/A	14.5	7.5+
Joint		12.9	6.1
Woman		13.0	5.1
Women's Status in Society			
OK to Beat Wife if she goes out without permission			
No	4.7	13.2	6.6
Yes	4.3	14.1	7.2
OK to Beat Wife if she neglects the children			
No	4.4	13.7	6.7
Yes	5.4	13.9	6.9
OK to Beat Wife if she argues with her spouse			
No	4.7	12.5*	6.6
Yes	4.3	14.9	7.1
OK to Beat Wife if she refuses to have sex			
No	5.3+	13.0	6.7
Yes	3.7	14.2	6.8
OK to Beat Wife if she burns the food			
No	4.6	12.5*	6.4**
Yes	4.7	15.3	8.1

***P<0.001; **P<0.01; *P<0.05, p<.0.10, N/A=Data not available

Table 6: Multivariate Logistic Regression of factors associated with CED (BMI<18.5) in Zimbabwe, Zambia and Malawi (odds ratios)

	Zimbabwe	Zambia	Malawi
Sociodemographics			
Urban Residence	0.72	1.11	0.67+
Household Wealth	1.00	0.99	0.99
Had at least one Birth	0.91	1.48	0.79
Household Size	0.98	0.94**	0.95+
Partner is at Home	0.89	0.68	0.56
Partner is Polygynous	0.76	1.22	1.27
Woman's Characteristics			
Women's Age (years)	0.94***	1.02**	1.00
Literate	--	0.97	0.97
Women's Education Level			
None (comparison)	1.00	1.00	1.00
Some Primary	0.58	0.78	0.99
Completed Primary	0.62	0.61+	1.04
Secondary or More	0.21**	0.58+	0.72
Women's Employment			
Not Working (comparison)	1.00	1.00	1.00
In Agriculture	1.01	0.82	0.78
Unskilled/Skilled Manual	1.67	0.51	2.02
Non-Manual	1.04	0.44	1.35
Professional	3.88*	0.11+	3.71
Woman's Relative Status			
Age Difference			
Woman Older	1.38	0.42	0.87
Same Age	1.00	1.00	1.00
Partner Older	0.96	0.71**	0.78*
Education Level Difference			
Woman More	0.37*	1.57*	0.96
Same Level	1.00	1.00	1.00
Partner More	0.50*	0.85	0.93
Occupational Level			
Both Unemployed	0.60	0.34	N/A
Both in Agriculture	0.89	1.09	1.18
Woman Higher	1.01	1.00	0.38
Same Level	1.00	0.75	1.00
Partner Higher	0.66	0.86	0.45
Women's Status in Society			
Wife-beating is justified (# of domains)	0.84+	1.02	0.95
Autonomy in Decision-Making			
Woman Has Final Say (# of decisions)	1.02	0.90	0.94
Partner Has Final Say (# of decisions)†	0.99	1.08+	1.07*
Joint Final Say (# of decisions)	1.01	0.95	0.94+
N	1788	2627	4281

***P<0.001; **P<0.01; *P<0.05, +p<0.10, , N/A data not available, –Variable dropped due to colinearity
† Modeled separately using all variables shown except woman's and joint decision-making.

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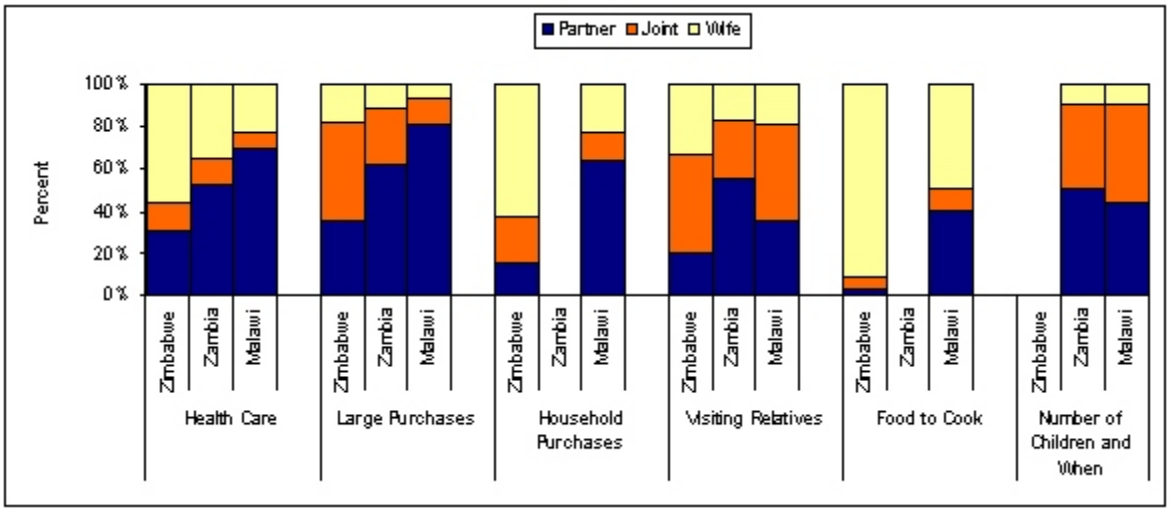
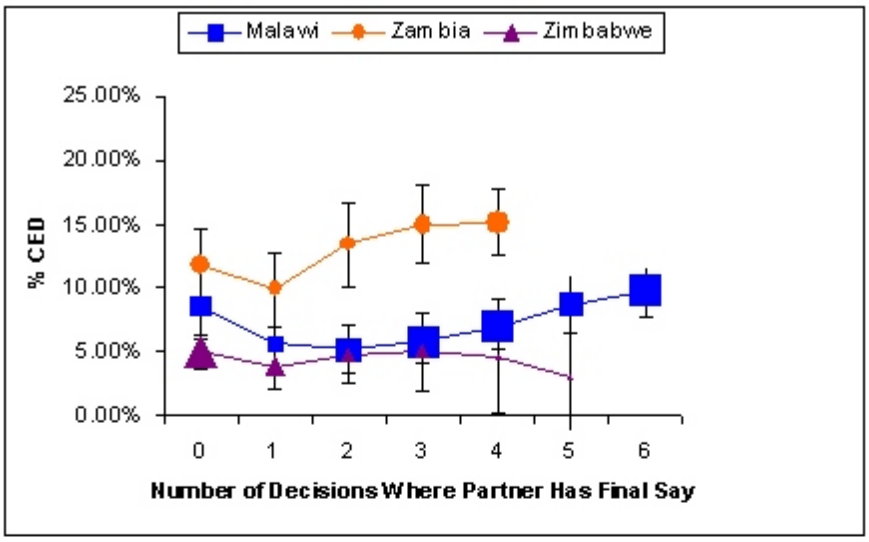
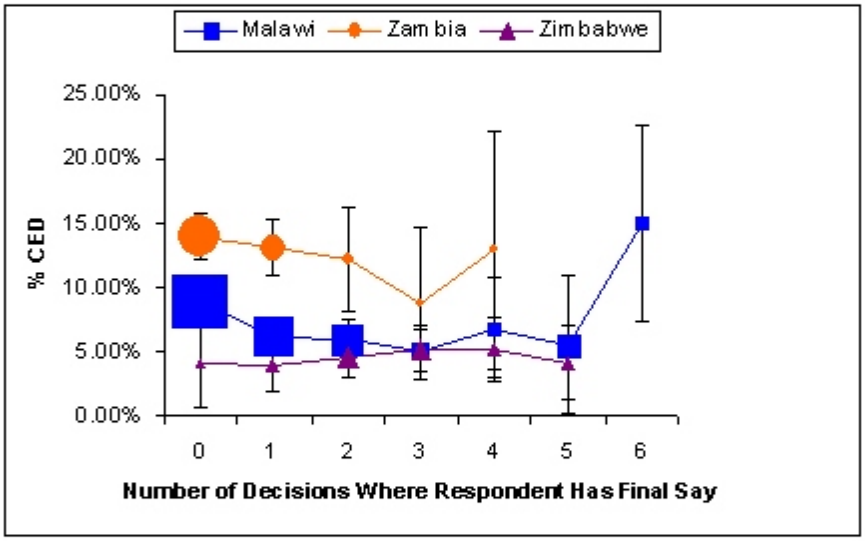


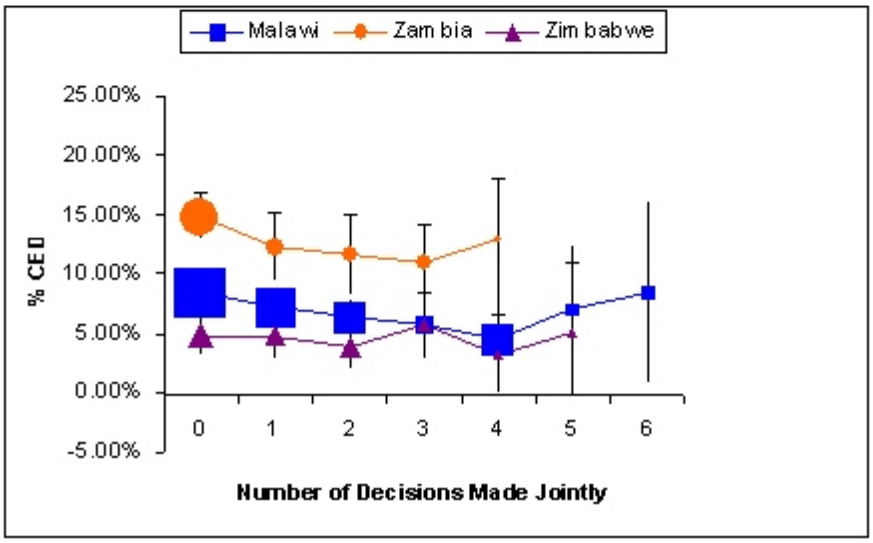
Figure 1: Percentage who contributes to the final decision by country and household decision-making domain



Panel A



Panel B



Panel C

Figure 2: Percentage of women with CED by the number of decisions made by the partner (Panel A), the respondent (Panel B) and jointly (Panel C)