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Paper presented at the CRPC/ ODI Roundtable 'Inheritance and the Intergenerational Transmission of Poverty', ODI, London, 11 October 2010.

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Abstract

Widows in sub-Saharan Africa are perceived to face wide-spread discrimination in asset and property inheritance following the death of a spouse, leading to poverty for themselves and their children. However, large-sample empirical research directly supporting this claim is scarce. This paper explores levels, determinants and effects of asset inheritance among widows using data from two sources: 1) cross-country, nationally representative Demographic and Health Survey (DHS) data from 15 sub-Saharan African countries to assess levels and correlates of asset inheritance among ever widowed women ages 15 to 49, and 2) a 13 year longitudinal panel from the Kagera region in northwestern Tanzania to examine the relationship between inheritance and levels of household per capita consumption and value of asset stocks. Results indicate that across the 15 DHS countries, less than half of widows report inheriting any assets (average inheritance of any assets is 47 percent, ranging from 22 percent in Sierra Leone to 66 percent in Rwanda), while report of inheriting the majority of assets is lower (average of 32 percent ranging from 13 percent in Sierra Leone to 60 percent in Rwanda). Across countries, inheritance is generally correlated with higher education and wealth, indicating that women with higher socioeconomic status may be more able to negotiate favorable asset inheritance outcomes. Findings from Kagera indicate that the value of inheritances, especially for widows (and specifically land inheritance), is significant in determining changes in long-term household welfare when accounting for sources of unobservable community and individual-level bias. Taken together, findings indicate a major role for creative and culturally sensitive program design to protect widow asset inheritance both through property and family law, coupled with rigorous impact evaluation to document effectiveness of these programs.

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Executive Summary

Background and Objectives: Widows in sub-Saharan Africa are perceived to face wide-spread discrimination in asset and property inheritance following the death of a spouse, leading to poverty for themselves and their children. However, large-sample empirical research directly supporting this claim is scarce. The objectives of this paper are several: first, to provide empirical evidence surrounding the magnitude of inheritance issues for widows in SSA, and second, to provide evidence, within a specific region in northwestern Tanzania, on dynamics and welfare effects of these inheritances.

Data: This paper explores levels, determinants and effects of asset inheritance among widows using data from two sources: 1) cross-country, nationally representative Demographic and Health Survey (DHS) data from 15 sub-Saharan African countries to assess levels and correlates of asset inheritance among ever widowed women ages 15 to 49, and 2) a 13 year longitudinal panel, the Kagera Health and Development Survey collected from 1991 to 2004 in northwestern Tanzania to examine the relationship between inheritance and levels of household per capita consumption and value of asset stocks. The DHS collected questions on inheritance by widows in select countries since 2005 and include: Benin (2006), Congo/Brazzeville (2005), Democratic Republic of Congo (2007), Guinea (2005), Mali (2006), Namibia (2006/7), Niger (2006), Nigeria (2008), Rwanda (2005), Senegal (2005), Sierra Leone (2008), Tanzania (2004), Uganda (2006), Zambia (2007) and Zimbabwe (2005/6).

Methods: Cross-country profiles of widows from the DHS are analyzed using descriptive and bivariate methods. The sample is made of all current or ever widowed women ages 15 to 49 across all 15 countries, resulting in a sample of 8,725 women. Bivariate analysis uses χ^2 tests are run to test for significant differences according to three sets of background factors: 1) cultural and demographic factors (age groups, ethnicity, Muslim religion, any children, total fertility rate and polygamous union), 2) economic factors (education levels and wealth quintiles) and 3) locational factors (region of residence and urbanicity). The KHDS is analyzed using multivariate regression models (cross-sectional, panel with

community-level fixed effects, panel with individual-level fixed effects) controlling for individual background socio economic factors to examine the effect of the household receipt of inheritance on changes in household-level per capita consumption levels and household value of asset stocks.

Results: Results indicate that across the 15 DHS countries, less than half of widows report inheriting any assets (average inheritance of any assets is 47 percent, ranging from 22 percent in Sierra Leone to 66 percent in Rwanda), while report of inheriting the majority of assets is lower (average of 32 percent ranging from 13 percent in Sierra Leone to 60 percent in Rwanda). Across countries, inheritance is generally correlated with higher education and wealth, indicating that women with higher socioeconomic status may be more able to negotiate favorable asset inheritance outcomes. Findings from Kagera indicate that the value of inheritances, especially for widows (and specifically land inheritance), is significant in determining changes in household consumption and asset stocks.

Conclusion/Policy implications: Property grabbing is a continued problem for widows across sub-Saharan Africa. Further, inheritances have a significant role in determining household welfare as measured by current consumption and asset stocks. Because of limited data availability, future data collection efforts of the DHS and other household surveys should expand efforts to collect analyzable data surrounding these dynamics. Findings indicate a major role for creative and culturally sensitive program design to protect widow asset inheritance such as land titling, will writing and provision of legal services, coupled with rigorous impact evaluation to document effectiveness of these programs.

I. Introduction

Popular perception of widowhood in sub-Saharan Africa (SSA) paints a picture of discrimination, deprivation and suffering endured by women who are often stripped of property and assets following the death of a spouse. The majority of evidence surrounding wealth dynamics at widowhood is based on qualitative research, case studies, anecdotes or the popular press, often framed in a human rights or legal perspective (Cooper 2010b; ICRW, 2005; ICRW, 2007; Izumi, 2007; LaFraniere, 2005.; Sossou, 2002; Walsh, 2005; Young, 2006). For example, a Human Rights Watch brief on property rights discriminations in Kenya recounts stories of dozens of widows who were stripped of assets (including land and livestock) and in many cases forced to undergo ritual cleansing (Human Rights Watch 2003).[1] Izumi (2007) defines asset disinheritance as a form of gender-based violence and documents stories of widows who are humiliated, robbed of self esteem and others who literally die defending their property. Concerns over widows' human rights violations have been exacerbated in the wake of the HIV epidemic, especially in SSA and other endemic regions. An increase in the absolute number of widows is partially attributed to HIV/AIDS. It is also cited as impoverishing a household prior to the husband's death, leaving a widow few resources with which to resist outside pressures exerted by the clan or extended family regarding inheritances (Drimie 2002).[2] In addition, Strickland argues that when women have weak property rights they are unable to secure resources that would allow them to improve their chances of preventing

[1] Widow inheritance or '*levirate* marriage' is the practice though which a male relative of the dead husband takes the widow as a wife, traditionally in part to provide economic security for the woman. Although variants of the practice exist by tribe, historically, widow inheritance included cleansing involving sex with a social outcast or male relative to rid the woman of her dead husband's evil spirits and misfortune (Malungo, 2001). In this practice, sex is often forced and protection is rarely used, as the cleansing is not thought to be valid unless semen enters the woman (Walsh, 2005).

[2] For example, AIDS related losses can reduce African household incomes by up to 80 percent, food consumption by 15 to 30 percent and primary school enrollment by 20 to 40 percent (Whiteside, 2002).

infection, even before the dissolution of a marriage or death of her spouse (Strickland 2004).[3] As can be concluded from the above evidence, there is extensive documentation of inheritance discrimination and human rights violations against widows across diverse geographic and cultural settings.

However, as with many claims which appeal to a human rights perspective, critics may argue that the 'property grabbing' is built on the exhibition of the worst case scenarios and although unfortunate, these events are not relevant or significant for women as a group. Data available to analyze the dynamics of widowhood in developing countries is extremely limited, however a United Nations (UN) brief on widowhood estimates that 44 percent of women over 60 years old and 16 of women aged 45 to 59 in SSA are widows (UN 2001).[4]" In addition, there is evidence that percentages of widows and divorcees or female headed households is increasing, especially in SSA and other regions with high HIV rates (Chapoto, Jayne, and Mason 2010; Mfono et al. 2008). As an example, in the Zimbabwe DHS (of which the 2005/6 data is analyzed in this paper), the percentage of current widows in the population among women 15 to 49 increases from 3.5 to 4.2 to 7.5 percent in cross-sections 1994, 1999 and 2005/6 respectively.[5] This paper seeks to provide preliminary empirical evidence exploring levels, correlates and effects of widow's property inheritance on household welfare using a variety of data sources. First, nationally-representative Demographic and Health Survey (DHS) data collected among women ages 15 to 49 from 15 SSA countries are presented to assess levels and correlates of asset inheritance among ever widowed women. Second, longitudinal data from the Kagera Health and Development Survey (KHDS), a 13 year panel in northwestern Tanzania is used to examine dynamics of asset inheritance among

[3] Despite national poverty levels being viewed as a risk factor for HIV/AIDS, there is considerable debate as to the relationship between wealth and HIV within a given resource-poor country (Bingenheimer 2007; Mishra et al. 2007; Piot, Greener, & Russell 2007).

[4] The data presented in this brief are from 1985 to 1997 and are taken from the World's Women 2000: Trends and Statistics.

[5] According to the recent DHS estimates, Zimbabwe has an 18 percent HIV rate (Zimbabwe CSO and Macro International 2005).

households where widows reside and their contribution to overall levels of annual household per capita consumption expenditure and the value of household asset stocks using multivariate regression models. The objectives of this paper are several: first, to provide empirical evidence surrounding the magnitude of inheritance issues for widows in SSA, and second, to provide evidence, within a specific region in northwestern Tanzania, on dynamics and welfare effects of these inheritances. Finally, the paper seeks to explore research directions, and to suggest promising policies and programs to ameliorate inheritance inequities among women and widows in particular.

Results from the 15 DHS countries indicate that of women ages 15 to 49 interviewed, approximately 5.03 percent (N = 8,725) have ever been widowed. Of these, approximately 46.95 percent report inheriting any assets following their spouses' deaths (ranging from 21.88 percent in Sierra Leone to 65.61 percent in Rwanda) and approximately 31.94 percent report inheriting the majority of assets (ranging from 12.65 percent in Sierra Leone to 59.96 percent in Rwanda). Although variable by country, bivariate analysis of these outcomes with background characteristics confirms that older, better educated and wealthier women are better situated to negotiate favorable inheritance as compared to their counterparts. Results from the KHDS longitudinal analysis indicate that modest increases in nominal household per capita consumption are observed over the 13 year period, while large increases are observed in nominal value of asset stocks. In comparison, the average value of household inheritances is small, however among households inheriting any value, the contribution is quite large (over four times per capita consumption and just under half of household endline value of asset stocks). Regression analysis shows that the total value of inheritance, especially for households in which widows reside (and specifically land inheritance), is significant in determining both long-term household per capita consumption and asset stocks while accounting for sources of unobservable community and individual-level bias.

The remaining sections of the paper are organized as follows: Section II provides a framework for conceptualizing asset inheritance among widows and reviews relevant empirical literature; Section III introduces the data and model used in the analysis and Section IV presents results. The paper concludes

with discussion of findings and their generalizability, limitations and implications for policy and further research.

II. Frameworks and evidence: widow's property inheritance in sub-Saharan Africa

The framework developed by Deere and Doss to examine the gender-asset gap can be applied to guide the specific case of widows and property inheritance (Deere and Doss 2006). In the paper, they ask the central question: "*What affects women's ability to accumulate wealth*?" and identify factors conditioned at different levels: the state, the family, the community and the market. State-level factors include civil codes as well as property and family law affecting the accumulation, control and transmission of property. These broadly encompass marriage and divorce laws, legal provisions such as prenuptial agreements, and writing of wills, pension, taxation and social security systems. Family and community characteristics or norms interact with these legal frameworks, and can often be as influential as formal written law. Family and community factors include diversity of marital regimes, for example polygamous marriages and extended household units often found in SSA. They also include customs such as brideprice or dowry which may influence gendered asset accumulation and socioeconomic or demographic characteristics such as education levels and fertility levels. Finally, markets generally and especially labor and financial markets determine women's income earning ability, options for savings and availability of credit choices. A global review of evidence and further discussion of the typologies included within these categories is found in Deere and Doss (2006).

This paper examines a specific type of marital outcome (widowhood) and a specific type of horizontal asset accumulation (or inheritance). The definitions of who is considered a 'widow' as well as what is considered 'inheritance' depends largely on the constructs used in survey data collection as defined in subsequent sections. However, broadly a woman is defined as ever experiencing widowhood if she has lost a spouse to mortality, including those women in common law marriages, and who may or may not have subsequently re-partnered or re-married. Inheritance of assets is defined to generally cover land, in-kind asset and cash property transfers at the time of death, and largely excludes broader sources

of intergenerational transfers such as those at birth, marriage or retirement (for review of these typologies of *inter vivos* transfers see Cooper 2010). In addition, this paper focuses largely on individual and household level factors which vary across women which are easily measured in household surveys and can be used as policy or program targeting mechanisms.[6] These factors include marital regimes, religious context, age and education, and existence of children or heirs and their linkages to inheritance of assets and are explored further in section IIIc. The remaining section reviews studies on quantitative impacts of widow's property inheritance, focusing on levels, determinants and impacts of inheritance on wealth and asset accumulation. The review includes strictly *de facto* micro-level evidence of inheritance, in contrast to documentation of institutional changes in laws or legal status since these analyses typically rely on macro-level modeling, cluster analysis or legal analysis (See UN-HABITAT 2006 for review of constitutional provisions on women's inheritance rights in SSA).

Empirical research on property inheritance among widows comes from a variety of mostly unpublished reports, often linked to studies on HIV and prime-age adult mortality. Perhaps the most rigorous documentation of inheritance loss comes from an evaluation in Zambia using population-level panel data from 2001 to 2004 (Chapoto, Jayne, and Mason 2010). Findings indicate the number of widow headed households rose from 9.4 to 12.3 percent of the sample over the panel period and that on average these households controlled 35 percent less land than before their husband's death. Although the authors are able to control for other factors related to land loss through household fixed-effects and have a sample size of over 5,000 rural farm households, they are not able to examine other assets, or directly attribute land loss to disinheritance rather than selling for consumption gains or consumption smoothing. A study with similar motivation in Kenya using a two-year panel from 1997 to 2000 of approximately 1,400 rural households finds that the death of a prime-age adult male results in the reduction of farm assets and small

[6] Although qualitative and anthropologic literature identifies a variety of other social factors, including fear of punishment and violence, mistrust of traditional institutions, and discrimination in legal processes, these are not easily captured, measured or identifiable in quantitative analysis (Welch, Duvvury, & Nicoletti, 2007).

livestock, while the death of a prime-age adult female results in the reduction of only small livestock (Yamano and Jayne 2004). In a technical report, Mather and Donovan use a panel of 4,058 Mozambican households surveyed in 2002 and 2005 to analyze among other outcomes, the effect of prime-age adult mortality on crop and non-farm income, total household income and asset levels. Results indicate that there are significant reductions in total landholding both for deaths of adult females and males (19 percent and 20 respectively), although reductions vary by region, which may be due to the locations of matrilineal lineage societies in Northern and Central Mozambique (Mather and Donovan 2008). However, large differences by gender are found for changes in livestock holdings in households experiencing male deaths (34 percent reduction) while none were found for households experiencing female deaths. Despite using panel methods and regression analysis to analyze dynamics, authors in the Zambia, Kenya and Mozambique studies are not able to distinguish between dynamics of selling, property grabbing, or other sources of asset loss. The Zambia and Kenya studies are the only known studies to date which are population representative (Chapoto, Jayne, and Mason 2010; Yamano and Jayne 2004).[7]

Other quantitative evidence documenting property and asset inheritance among widows comes mainly from technical or policy reports. Although less rigorous, partially due to smaller sample sizes, these studies provide useful snap shots of mean levels across subsamples of widows and asset types. A survey collected to study HIV and its effects on agriculture in Namibia find that among 282 households who had experienced the death of a household member between 1996 to 2001, 52 percent reported losing cattle, 38 percent report losing farm equipment and 31 percent report losing small stock (Africa

[7] A related study by Fafchamps and Quisumbing also utilizes large scale panel data to analyze hypothetical inheritance in scenarios of divorce or separation and death of spouse (Fafchamps and Quisumbing 2002). Findings indicate approximately half of surveyed households expect the land and house to go to the husband upon a no-fault divorce, while 40 percent expect them to be divided equally between husband and wife. Property inheritance expectations for women following the death of a spouse are higher, where upward of 85 percent of the sample report land and house would be inherited by their spouse or their spouse and children. However, in the Ethiopian context, it is unclear if the solicited expectations will be reflected in actual division of property.

Institutional Management Services 2003). A parallel survey in Uganda find that 39 percent of households (n = 100) who experienced the death of a head reported reduction in productive land, however no distinction was made between selling and dispossession of land (NAADS 2003). In an evaluation of support services for children affected by AIDS in Uganda, the Population Council and collaborators find approximately 29 percent of 204 widows surveyed had had property taken away from them when their husbands died (Gilborn et al. 2001). A survey of 115 widows in the Mukono District of Uganda carried out by the International Justice Mission between 2005 and 2007 reveals that 41 percent (47 widows) have experienced property grabbing, and this percentage increases to 51 percent (59 widows) including attempts/threats of property grabbing (IJM 2008).

While related bodies of evidence touching on women's property and inheritance rights more generally, as well as intergenerational transfers to children or young adults is informative in framing literature focused on widows, it does not speak directly to the substantial gaps in the empirical literature among a widow-specific sample (for an annotated review of literature addressing these general issues see Cooper, 2008). Literature on welfare effects of inheritance is especially thin, especially when it is considered that property dispossession is greatly influenced by regional variations in cultural norms and ethnic groups.

III. Data and methods

IIIa. Demographic and Health Surveys (DHS)

The data utilized are recent DHS from 15 SSA countries: Benin (2006), Congo/Brazzeville (2005), Democratic Republic of Congo (2007), Guinea (2005), Mali (2006), Namibia (2006/7), Niger (2006), Nigeria (2008), Rwanda (2005), Senegal (2005), Sierra Leone (2008), Tanzania (2004), Uganda (2006), Zambia (2007) and Zimbabwe (2005/6). The DHS are cross-section nationally representative surveys collected by host country governments with funding and technical assistance from Macro International

and USAID.[8] Similarity of the survey instrument allows cross-country comparisons of variables and outcomes selected for this analysis. Questions on inheritance after widowhood are included in select countries after 2003, allowing for cross-country analysis using the 15 countries listed above.[9] The DHS asks all women ages 15 to 49 currently widowed or who have ever experienced the death of a spouse *"To whom did most of your late husband's property go?"* Response categories are: 1) widow or widow's children, 2) other wife (i.e. co-wife in polygamous union), 3) spouse's children or family, 4) other relative or person and 5) spouse had no property.[10] If the woman indicates someone other than herself, she is then asked *"Did you receive any of your late husband's assets or valuables?*"[11] From these questions, two main outcome variables are constructed for use in this analysis. The first is an indicator of inherited 'any assets' and equals one if the woman (or her children) answers affirmative to receiving *any* of her late husband's assets or valuables. The second is an indicator of inherited the 'majority of assets' and equals one if the woman (or her children) answers she herself received *most* of her late husband's property. The DHS collect a rich set of individual and household-level demographic and socioeconomic indicators which will be used to conduct a descriptive and bivariate analysis which will be described in Section IIIc. Further information on country contexts and background indicators by country can be found in the DHS Technical Reports accessible on the MEASURE DHS website (www.measuredhs.com).

IIIb. Kagera Health and Development Survey (KHDS)

[8] Funding is provided through USAID sponsored MEASURE DHS in addition to other international development agencies. Data is publicly available and downloadable from www.measuredhs.com.

[9] This analysis includes all publicly available DHS last accessed on May 25, 2010. Surveys collected after 2003 in SSA countries which do not include inheritance questions and are thus not analyzed are: Cameroon (2004), Chad (2004), Ethiopia (2005), Lesotho (2005), Liberia (2007) and Malawi (2004).

[10] It should be noted the response categories for this question vary by country (for example in some countries the widow and the widow's children are listed as separate categories and several countries did not offer the response of '*husband had no property*') however these differences are not expected to influence results.

[11] Unfortunately this or a similar question is not asked to women who report being divorced or separated.

The KHDS is a longitudinal household survey of the Kagera region in northwestern Tanzania conducted by the World Bank and collaborating organizations. Kagera is primarily rural and borders Uganda to the north, Rwanda and Burundi to the west and Lake Victoria to the east. The region is a hub for overland transport from East to Central Africa and has been affected a host of regional conflicts, including the most recent influx of refugees from the Rwanda and Burundi genocides in the early to mid 1990s. The region is largely agricultural, traditional crops include banana and coffee in the north and maize, sorghum and tobacco in the south, although there is increasing diversification into cash crops and off farm income generating activities (De Weerdt 2010). Land and inheritance law in Kagera is traditionally governed by the clan, including the patralinal Haya, as well as the Nyambo tribes in the north and the Subi, Sukuma, Zinza and Hagaza in the south (De Weerdt 2010). Although customary law typically discriminates against women, there have been some advances made in inheritance and property rights for women, specifically linked to the passage of the Land Acts of 1999 (Peterman 2010). Using community-level data from KHDS, Peterman finds significant increases in women's property inheritance norms over the time period from the early 1990's to 2004 (Peterman 2010). For example in 1991, approximately half of all 51 sample villages reported it was customary for the wife to inherit land and the house after a husband's death, while these percentages increased to 86 and 90 percent respectively in 2004.[12] This evidence in conjunction with qualitative and institutional analysis confirms that general increases in women's property rights have been realized in the last two decades.

The KHDS collected five waves of household level data. Waves one through four were collected at six to seven month intervals starting in 1991 and the fifth wave was fielded approximately 13 years

[12] These figures are collected at the community level and are thus an approximation of dynamics at the household level. For further discussion and analysis of the associations between changes in customary inheritance patterns on land, housing, other assets and widow inheritance and changes in individual level women's economic outcomes, see Peterman 2010.

later in 2004 (Beegle, De Weerdt, and Dercon 2006).[13] The survey was originally designed to measure the impact of prime-age adult deaths and illness due to HIV/AIDS on the welfare outcomes of remaining individuals and households, including child schooling, nutrition and adult labor force participation and poverty status. To accomplish this objective, the household sample was stratified on community adult mortality rates (from the 1988 census) and household-level indicators predictive of adult mortality such as incidence of chronic illness. Sampling lead to a high rate of prime-age adult mortality over the 13 year panel and makes the survey particularly relevant for analyzing dynamics surrounding widowhood and inheritance. Questionnaires also included detailed information on household consumption, expenditure, individual economic activities, education and health status, as well as community level information on health and education systems. The final sample included approximately 900 households in 51 communities (for map of Kagera and survey cluster locations see Figure A1 in the Appendix). Further information regarding sampling, attrition rate and questionnaire content is provided in survey technical documents and available through the World Bank Living Standards Measurement Survey website (Beegle, De Weerdt, and Dercon 2006). Due to differences in questionnaire design in waves one through four in the early 1990s, this analysis will utilize only wave one fielded in 1991 and wave five fielded in 2004.[14]

The KHDS collected information on household inheritance in 2004 through two different series of questions. Recall that the KHDS was designed to capture dynamics around prime-age adult mortality and thus solicited information for each death of original or new household members over the panel period. For each death reported in the household, the respondent was asked *"Was [NAME]'s death associated with any inheritances?"* followed by the question *"What was the total value of the inheritance*

[13] More recently, a sixth wave was fielded in summer 2010, however data is not yet publicly available.

[14] Specifically, there are differences in recall periods between waves one and five (purchased and home produced foods are recalled at on 12 months) and between waves two, three and four (purchased and home produced foods are recalled on six months). Because of seasonailities in both these components, the differentiation is expected to be quite large in computing consumption aggregates across recall periods.

received by you or any other member of your household?" in the categories of cash, in-kind and land. Subsequently, the responded was asked *"In the past 10 years were there any inheritances received by anyone in the household?,"* and the enumerator is prompted to exclude those connected to the deaths previously listed. For these additional sources of inheritances, the respondent was asked to value the categories of cash, in-kind and land *as if* they were sold in 2004. From these series of questions, a total inheritance value in Tanzanian shillings (Tsh) can be constructed, as well as the relative contribution of inheritances in cash, land and other in-kind transfers.[15] Unfortunately, it is not possible to attribute these inheritances to a single individual or woman within the household, and thus the analysis which follows represents outcomes in households where adult women reside.

IIIc. Methodological approaches

In the first section of the paper, cross-country profiles of widows are presented using descriptive and bivariate methods. The sample is made of all current or ever widowed women ages 15 to 49 across all 15

[15] The differences in question wording here have implication for deflating the inheritance transfer amounts. In the first series of questions, the amount of transfer can be deflated using the Tanzanian Consumer Price Index (CPI) for the given year of the household member's death (obtained from the Tanzanian Bureau of Statistics on 18 July 2007). There may be some error in this method, as the inheritance may have actually occurred the year after the death or there may be recall bias in both the year of death or the transfer amount. In the second series of questions, where the respondent is asked to *"value the [goods/assets/land] from the inheritance as if the items were sold today"* the transfer value can be deflated using the same factors as used in constructing consumption aggregates (discussed in section IIIc). However, the exception is for the cash component, in which we cannot assign a year of inheritance and therefore deflate using the midpoint (1998) between the two survey rounds. Although this results in the inheritance transfer amounts being deflated by different methods, the constructed Laspeyres and Fishers indices which are used to normalize consumption aggregates and the Tanzanian CPI are shown to track each other closely (KHDS 2004; the KHDS constructed data shows an inflation of 4.05 over the panel, while the National Bureau of Statistics reports an inflation of 4.2 over the same period. There are however reasons why the Kagera specific and national CPI would be expected to differ).

countries, resulting in a sample of 8,725 women. A more sophisticated analysis using the DHS is not possible due to the cross-sectional nature of the data. In particular, data was not collected to ascertain the timing of widowhood and therefore, the death of certain spouses could have occurred a decade ago, while for others, it could have taken place a week prior to the survey. Consequently, analysis using *current* socioeconomic measures will be biased because it will be unknown if a relationship is a result of factors pre or post asset inheritance. This is especially problematic if the interest is in determining the causes of or effects of asset inheritance, independent of background factors. Despite this limitation, analyses using the DHS are especially policy relevant because they represent a snapshot of the current situation of widows and have powerful targeting implications. Beyond basic sample sizes and descriptive statistics on widows across the 15 countries, bivariate analysis using χ^2 tests are run to test for significant differences according to three sets of background factors: 1) cultural and demographic factors (age groups, ethnicity, Muslim religion, any children, total fertility rate[16] and polygamous union)[17], 2) economic factors (education levels and wealth quintiles) and 3) locational factors (region of residence and urbanicity). Each category of background factors answers different questions regarding patterns of asset inheritance. Cultural and demographic factors are seen as important determinants of inheritance, especially in rural areas governed by customary law. For example, marriage arrangements including pologamy and numbers of children increase or decrease the number of potential beneficiaries of assets. Economic factors may in part determine asset inheritance (e.g. education levels) or be a result of asset inheritance (e.g. current wealth). The measures of wealth are pre-computed quintiles using factor analysis including background indicators of socioeconomic status such as dwelling characteristics, asset ownership and access to basic

[16] Total fertility rates are truncated at 12 children to facilitate computation of χ^2 tests. This results in truncation of approximately 0.4 percent of the sample.

[17] A variety of religious categories were collected by country. While synchronization of all categories was not feasible, the indicator of Muslim religion was a consistent category and expected to be associated with gender norms. Unfortunately, ethnic coding was not available in most countries examined and where available, is not included in the analysis due to the immense variation in ethnic groups.

infrastructure (Rutstein and Johnson 2004). Finally, locational variables such as region of residence are important targeting factors with implications for programs placement, both within and between countries. All analyses using the DHS are weighted according to population-level weights provided in the data.

In the second section of the paper, the KHDS is analyzed using multivariate regression models to examine the effect of the household receipt of inheritance on changes in household-level per capita consumption levels and household value of asset stocks. The sample is made of 946 women who were age 15 or older in the 1991 baseline and who are re-interviewed in the endline survey in 2004. In general, this relationship can be modeled as follows:

(1) $\boldsymbol{HH\ Welfare}\ \boldsymbol{Y}_{j,2004} = \beta_0 + \beta_1 * \boldsymbol{HH\ Inheritance}_{j1991\text{-}2004} + \beta_2 * \boldsymbol{Widowhood}_{i,2004} + \beta_3 * \boldsymbol{X}_{i,2004} + \beta_4 * \boldsymbol{X}_{j,2004} + \varepsilon_i$

Here the welfare outcome of household *j* is a function of household receipt of inheritance from 1991 to 2004, the marital status of index woman *i*, a vector of individual and household-level characteristics in 2004 ($\boldsymbol{X}_i$ and $\boldsymbol{X}_j$). The coefficient β_1 is expected to be significant (positive) under the hypothesis that household inheritance acts as a buffer against poor welfare outcomes; coefficient β_2 is also expected to be significant (negative) if a widowhood outcome compromises household welfare. To distinguish if the relationship between inheritance and welfare differ by marital regime, equation (1) is replicated in the sub-sample of ever widowed women and compared to results from the sub-sample of women who have never been widowed (in union, never married and separated or divorced women).[18] The KHDS collected detailed consumption measures which allow the construction of per annum, per capita values of consumption expenditure and value of household asset stocks. The indicator of consumption expenditure is pre-computed in the KHDS using twelve expenditure categories: 1) Rainy/dry season purchased food,

[18] Alternatively, an interaction term between inheritance and widowhood could be included in the full sample regression to ascertain if the association between inheritance and poverty status differed by widowhood. However, because of the small shares of households in both categories, there is little variation in the interaction term and thus is unlikely to yield credible results.

2) Non-seasonal purchased food, 3) Rainy/dry season home produced food, 4) Non-seasonal home produced food, 5) Education, 6) Other nonfood, 7) Health of household members, 8) Health of deceased, 9) Funeral, 10) Utilities, 11) Wage-in-kind, 12) Remittances. The asset stock indicator is also pre-computed and contains the following asset groupings: 1) Physical assets, 2) Business assets, 3) Durables, 4) Farm equipment, 5) Farm buildings, 6) Land, 7) Livestock, 8) Occupied dwelling, 9) Unoccupied dwelling. All values are deflated to baseline values using price questionnaires implemented in cluster communities, complimented with spatial information of households no longer residing in baseline communities. For more information on construction of consumption aggregates including subcomponents and detailed information on the price index see KHDS 2004, KHDS 2004b and De Weerdt, 2010. Other individual-level control variables included in the model are: age, education, marital status of the index woman, as well as religion and ethnicity of household head. Other household-level control variables included in the model are household size and season of interview. Both outcomes are logged to account for skewness of distributions and modeled using ordinary least squares (OLS) regression.

A simple cross-sectional model such as (1) does not take into account unobserved heterogeneous characteristics that could influence individual-level inheritance, marital status and household welfare. These could include initial wealth or socio-demographic characteristics of the household which may in turn influence a woman's propensity of becoming a widowed or the likelihood of receiving an inheritance transfer. If it is believed that these factors are important in also determining welfare, the error term ε_i in equation (1) would take the following form:

(2) $\varepsilon_i = \lambda_i + u_{it}$

where λ_i is constant across individuals and u_{it} is assumed to be $\sim N(0, \sigma^2_u)$. To address this potential bias, from time invariant sources, an individual-level panel fixed effects model is estimated and following specification:

(3) Δ ***HH Welfare*** $\boldsymbol{Y}_{j,1994\text{-}2004} = \beta_0 + \beta_1 * \Delta$ ***HH Inheritance*** $_{j1991\text{-}2004} + \beta_2 * \Delta$ ***Widow*** $_{i\ ,1991\text{-}2004} +$

$\beta_3 * \Delta \boldsymbol{X}_{i\ ,1991\text{-}2004} + \beta_4 * \Delta \boldsymbol{X}_{j,\ 1991\text{-}2004} + \Delta \varepsilon_{i\ 1991\text{-}2004}$

Equation (4) maps the change in household welfare over the panel period as a function of the change in inheritance indicators, the change in woman's marital status and the change in individual and household-level characteristics ($\Delta \boldsymbol{X}_i$ and $\Delta \boldsymbol{X}_j$). In this specification, the constant term (λ_i) is eliminated through differencing and equation (4) is left with a random error component, thus accounting for individual and fixed sources of bias. This approach relies on the assumption that the main source of endogeneity is from time-invariant factors influencing inheritance and marital status.[19] In the results which follow, three versions of the main model are presented: cross-sectional OLS model using the endline data (equation 1), cross-sectional OLS model using the endline data accounting for community-level unobservables (equation 1with community-level fixed effects) and panel OLS model accounting for individual-level unobservables (equation 3 with individual-level fixed effects).

IV. Results

IVa. Cross country profiles of widows and asset inheritance

Table 1 is a summary of weighted descriptive statistics of sample sizes and inheritance indicators for the pooled sample and by country. Results indicate that the percentage of women ages 15 to 49 who have ever experienced widowhood in the pooled sample is approximately 5.03 percent, ranging from 3.22 percent in Namibia to 9.06 percent in Zimbabwe. These percentages increase if the sample is limited to women who have ever been married (ranging from 4.72 percent in Congo to 12.41 percent in

[19] I acknowledge the possibility that time variant bias exists, which may affect both household welfare and the receipt of transfers. For example, in the case of HIV related death of a woman's husband, the household may be financially impoverished prior to the death, while simultaneously decreasing the likelihood that the household will receive any property or assets due to stigmatization or blame of the woman. The solution for this problem would typically include an instrumental variable approach to instrument receipt of transfer based on factors influencing transfer receipt, but largely exogenous to any given household's welfare except through the transfer itself. Future versions of this paper will explore the options of using an instrumental variable approach to decrease potential bias.

Zimbabwe).[20] Among the pooled sample approximately 47 percent of widows or their children report receiving any assets after their spouses' deaths. Widows and their children in Rwanda report the highest mean receipt of any assets (65.61 percent), while widows in Sierra Leone report the lowest mean receipt of any assets (21.88 percent). Among the pooled sample, and in all countries except Rwanda and Senegal, the majority of assets are reported to be inherited by the spouse's children and family. For example, in DRC the woman or woman's children report inheriting the majority of assets in 24 percent of the sample, while the spouse's family inherited the majority of assets in 63 percent of the sample. Co-wives in polygamous unions are reported to inherit the majority of assets in very low percentages across countries (3.52 percent in the pooled sample, ranging from 0.75 percent in Congo to 6.49 percent in Uganda), while other people or relatives are reported to inherit the majority of assets in comparably higher percentages (8.19 percent in the pooled sample, ranging from 2.09 percent in Namibia to 28.71 percent in Senegal).

[Insert Table 1 here]

Tables 2 and 3 report results from the bivariate analysis between demographic, economic, locational characteristics and inheritance of any assets (Table 2) or the majority of assets (Table 3) for the full sample and by country. Significance at the five percent level or higher is denoted by p-values in bold. Descriptive statistics for all characteristics are reported for the full sample and by country in Appendix Table A1. In the analysis of the full sample (first column) in Table 2, nearly all background characteristics are significantly correlated to inheriting any assets except for self-reporting as Muslim religion. Specifically, older women, with children, in a monogamous relationship, with higher levels of education and wealth, residing in urban areas are more likely to report inheriting any assets. For example, in the pooled sample, a widow with no schooling reports inheriting any assets in 43 percent of cases, while a widow with secondary level or above education reports inheriting assets in 54 percent of cases.

[20] Note these percentages are slightly larger compared to the DHS final country reports, which report percentages of *current* widows instead of women who have ever been widowed.

However, relationship with background characteristics vary in significance levels across countries. It should also be noted that where available, the majority of countries show significant correlations with ethnicity (6 out of 10) and regional variation (11 out of 15). The same general findings are mirrored in Table 3, however significance levels increase showing generally stronger correlations and the indicator of Muslim religion becomes significant. For example, moving from the youngest age group (15 to 29 years old) to the oldest age group (45 to 49 years old) increases widows reporting of inheriting the majority of assets from 24 to 33 percent. Although these initial correlations confirm hypotheses regarding background factors influencing inheritance patterns, they should not be taken as indicative of causation because of previously discussed problems inherent in determining timing of spouses' death.

[Insert Tables 2 and 3 here]

IVb. Widows and asset inheritance in Kagera, Tanzania

Tables 4, 5 and 6 present results from the regression analysis using the KHDS to explore the relationship between inheritance and 1) per capita annual household consumption expenditure and 2) value of household asset stocks with particular attention to widows. Table 4 shows descriptive statistics of outcomes, inheritance and marital status indicators for the full baseline (1991) and endline (2004) samples (columns A and B), as well as for the endline sample split by ever widowed and never widowed status (columns C and D). There are 946 women in the sample, of which 295 have ever been widowed and the remaining 651 have never experienced the death of a spouse. Per capita consumption expenditure in the full sample is approximately 165,000 Tsh, and this increases in nominal terms to 211,000 Tsh in the endline. The value of household asset stocks has increased 3.3 fold at approximately 694,000 (baseline) and 2,289,000 (endline) Tsh respectively, indicating a large increase in wealth over the panel period. Although women experiencing widowhood live in households with lower outcomes, they are not significantly different from those of never widowed women. Average total value of inheritance over the panel period is approximately 59,000 Tsh and is mostly received in land (34,000 Tsh), followed by other in-kind assets (21,000 Tsh) and cash (4,000 Tsh). However, this average value masks comparatively large values for those households who do receive inheritance. For example, among households who report any

inheritance, total value is approximately 919,000 Tsh, or over four times average per capita consumption in 2004 and just under half of household average value of asset stocks in 2004. Similar to welfare measures, although households with widows report receiving nearly twice the total value in inheritances, there are no significant differences in comparison to households were never widowed women reside. Here it is important to note that the comparison between households with ever and never widowed women is not a clean comparison. Because households with never widowed women may also receive transfers from other deceased family members, therefore the comparison is between households where women reside with inheritance from the death of a spouse, inheritance from other family members, and no inheritance among households reporting none.

Table 5 reports the main results for OLS regressions predicting welfare outcomes for cross-sectional models among the 2004 endline (A1 and B1), cross-sectional models among the endline with community-level fixed effects (A2 and B2), and panel first difference models with individual-level fixed effects (A3 and B3). Descriptive statistics of all control variables are reported in the Appendix Table A2; R-squared measures and sample sizes are reported at the bottom of the table. Across all models and both outcome measures the value of inheritance is significantly associated with higher welfare outcomes. While the magnitude and significance of this relationship decreases when accounting for sources of community-level and individual-level unobservables for household asset stocks, it increases in magnitude and significance in relationship to per capita consumption expenditure. For example, in the preferred model, a 0.046 percentage increase in the value of inheritance over the panel period corresponds to a one percentage increase in annual per capita consumption expenditure holding other factors constant (column A3). Likewise, a 0.955 percentage increase in the value of inheritance over the panel period corresponds to a one percent increase in value of household asset stocks holding other factors constant (column B3). The indicator of widow is also significant and negatively associated with all welfare outcomes across all models (with the exception of column A3 in the individual-level panel fixed effects model for per capita consumption). These results indicate a positive and robust relationship between inheritance and welfare

outcomes as well as a negative and robust relationship between widowhood and welfare outcomes in the Kagera sample.

To further explore the results in Table 5, parallel regressions were run splitting the sample into households with ever widowed and households with never widowed women. Summary results of this sensitivity analysis are reported in Table 6, where each coefficient represents a different regression and coefficients are reported only for the inheritance indicator predicting per capita consumption (Panel A) and value of household assets (Panel B). In determining household per capita consumption expenditure, the relationship with inheritance is clearly driven by the sample of ever widowed women and this relationship becomes stronger when accounting for unobservables at the community and individual-level. This negative and increasing relationship among widows signifies that unobservables for widows particularly decreases likelihood of high welfare measures, which is consistent with the descriptive findings that households with widows have no significant differences in terms of mean welfare measures. In contrast, there is no significant relationship found between inheritance and household per capita consumption among the sample of never married women. In determining the value of household asset stocks, a different pattern emerges: in the cross-sectional models, significant relationships are found with both samples (although magnitude of coefficients is higher among the group of households containing ever widowed women), although these relationships becomes insignificant in the panel model. This could be because of relatively small samples and few degrees of freedom, as magnitudes of coefficients are largely in the same range as in other models. This result indicates that in households where widows reside, inheritances are important in determining asset stocks perhaps due to investments, whereas this dynamic is not observed in households where no widows reside. Although not reported, all models in Tables 4 and 5 were re-run using disaggregated categories of inheritance types (land, other in-kind and cash). As is expected, findings are largely driven by land inheritance, however, since the magnitude of the in-kind and cash groups are small, these results are only suggestive.

V. Discussion, conclusion and policy implications

Women's property and inheritance rights are now on the development agenda and being incorporated into research and program implementation plans among donors and other international organizations. Linkages have been made not only to land tenure, food security and other agricultural sectors, but also to those involving HIV/AIDS, health and general poverty (Cooper 2008; ICRW 2007; USAID 2009). However, many of these linkages are theoretical, based on case studies and not necessarily quantified using empirical research methods. While literature on agricultural outcomes is more common, especially related to land rights and land security, the quantitative literature on linkages between women's inheritance and property rights and general welfare or poverty measures is thin and fraught with problems of endogeneity. Although results from the both analyses presented here largely reflect hypotheses from qualitative and other existing literature, there are several interesting results which warrant further discussion.

The analyses of DHS shows that overall, more than half of widows in the 15 examined countries report *no* asset inheritance, and only in Rwanda and Senegal do widows and their children report inheriting the *majority* of assets. In all other countries the majority of assets are reported as being inherited by the spouses' families or other children. The measures of majority inheritance are particularly low in Sierra Leone (12.65 percent), Congo (15.81 percent), Benin (21.90 percent) and DRC (23.80 percent), which may signify restrictive legal frameworks, as well as added insecurity due to conflict (USAID 2004). The correlate analysis generally supports the hypotheses that older, wealthier, more educated women have a better chance of protecting assets from dispossession. Chapoto and colleagues also find similar patterns in Zambia where older women, in addition to those with greater kinship networks in the community are able to protect against losing property (Chapoto, Jayne, and Mason 2010). Furthermore, qualitative research in matrilineal villages in Mozambique finds that property dispossession is a problem even in traditionally women centered inheritance regimes (Hendricks and Meagher 2007). However, Fafchamps and Quisumbing (2002) find older women in Ethiopia anticipate inheriting fewer assets, which they speculate may be due to the expectation of being economically supported by children.

Also in contrast to findings presented in this paper, in the Ethiopian context, results suggest educated women anticipate receiving fewer assets through inheritance, which the authors suggest may be indicative of access to non-farm or other income generating opportunities (Fafchamps and Quisumbing 2002). These findings highlight the need to conduct more in-depth country-specific analysis to understand dynamics and determinants of asset inheritance across SSA.

Although the analysis using DHS and Kagera data is focused on women who have ever experienced widowhood, there are a several reasons why the findings could pertain to asset and property inheritance for women in general. First, it is likely that women who are separated or divorced face similar (or in some cases, more restrictive) asset inheritance discrimination as widows, contingent on the nature of the separation. Unfortunately, questions in the DHS were only asked to women whose spouses had died, and the sample of separated or divorced women in Kagera is too small for a subsample analysis. Second, research shows that individuals often make investments and other productivity enhancing decisions on land or in small businesses based on their expectations of future assets security (Deininger and Jin 2006; USAID 2009). Therefore, if women expect or fear dispossession of assets or property grabbing this expectation has the potential to affect their economic outcomes even before the deaths of their spouses. In addition, if the percentage of women who report being separated or divorced in the 2005/6 data were to be included, an additional 7.7 percent of women would be added to the sample.[21] The issue of security of asset ownership is an issue with the potential to affect the majority of women (both directly and indirectly). In addition, we do not know what the contribution of restrictive property rights or asset dispossession is to the burden or probability of contracting HIV/AIDS (Cooper 2010). This question remains extremely difficult to answer, not only because biomarkers must be collected, but also because in many cases if their husband's death is due to HIV/AIDS, women will already have a higher

[21] As previously noted, these percentages are an underestimation since they measure the percentage currently widowed and currently separated or divorced, which are lower as compared to the percentage ever experiencing these events.

probability of being HIV positive themselves, and is another topic which needs to be addressed in future research efforts.[22]

There are a number of important limitations in this analysis. The first is an inherent limitation of household-based data collection: widows who are the worst off may not be part of the sample because they may be living on the streets or in informal housing arrangements. As previously mentioned, due to lack of ability to analyze inheritance trends, there is evidence on if or how asset inheritance dynamics are changing in the DHS countries. However, some country specific evidence is promising: Quisumbing, Estudillo and Otsuka (2004) find women's land inheritance improving in Western Ghana; Peterman (2010) finds shifts toward *de facto* equity in women's inheritance norms in Northwestern Tanzania. Another limitation is the ambiguity as to what assets and property are being referenced in the DHS questionnaire design. Throughout this document, assets and property are used interchangeably, whereas a more specific questionnaire design could have differentiated large assets (land, house), from household items (refrigerator, radio), small valuables (jewelry, watches) and productive assets (agricultural tools and machinery, irrigation pumps). In addition, the DHS only collects information for women ages 15 to 49, therefore, it would be expected given the age range of widows, the sample is likely leaving out a very relevant segment of the population with perhaps differing experiences on asset dispossession. Finally, in the Kagera sample, there are attrition issues, both due to mortality and migration of women which are not explicitly addressed in the current analysis.

Based on these limitations, several suggestions are proposed for the DHS data collection efforts. First, questions on assets in the DHS should be expanded to be asked to women who have experienced divorce and separation. Ideally these questions would include prompts to understand dynamics of the

[22] However, recent promising work has been conducted looking at the effects of HIV on agriculture and land losses (Chapoto, Jayne, & Mason 2010; Donovan, Bailey, Mpyisi, & Weber 2003; Mather & Donovan 2008). Cooper 2010 devotes a section of her review of policy considerations to mainly qualitative evidence surrounding the HIV and inheritance linkage.

separation, including fault and both knowledge and use of legal structures in the separation. Second, if information on timing of marriage or death was collected among widows and divorcees, a trend analysis would be possible to assess expectations or changes in probability of property grabbing over time. In addition, a more specific disaggregation of assets into types as previously proposed would improve information gathering and targeting of interventions. Finally, these questions should be included in questionnaires not only for SSA, but also in Northern Africa, Asia and South America, as inheritance dynamics are expected to vary across countries and regions (UN 2001).[23]

Although women's asset inheritance is clearly a gendered issue, it is not necessarily the case that property dispossession is strictly limited to men property grabbing from women. For example, clan or extended family members who take property from widows often include other women. There is some evidence from Tanzania suggesting that women may actually contribute to or reinforce the gender inequities and cultural norms in inheritance by bequeathing or gifting property and assets to sons rather than daughters as they are perceived as being more secure (Nkonya 2008). Given the diversity of dynamics surrounding gender dimensions of asset inheritance, evidence based research is needed to guide the growing portfolio of successful policy and programs (Cooper 2010). Gendered impact evaluation of land certification and effectiveness of titling regimes is an integral part of this process as schemes can be varied in their acceptability and functionality in different settings (Holden and Tefera 2008; Deininger et al. 2007; USAID 2006). Research has shown that contradictory to popular perception, the introduction of privatized land ownership systems have in some cases hurt, not helped women's land rights by ascribing land rights solely to a male household head, thereby bypassing the many other household members who use communal or family land (Lastarria-Cornhiel 1997; Tripp 2001; Whitehead and Tsikata 2003). Innovative program evaluation will also add to our knowledge of other methods through which property dispossession can be decreased. For example Mendenhall and colleagues evaluate a randomized

[23] Exploration of DHS data in Asia and the Middle East which collect this module finds only one country (Cambodia, 2005) for which the question is publicly available on August 2, 2009.

intervention of a will writing program in Lusaka, Zambia among individuals within monogamous unions in which at least one partner was HIV positive (Mendenhall et al. 2007). Findings suggest that individuals find even small items (clothing, kitchenware, furniture) to be important components of assets detailed in wills, and that often men specifically included instructions to their families not to take property from their wives and children. Other programs which have focused on integrating property rights into related programs (such as HIV/AIDS programs) have been anecdotally successful, however have not been formally evaluated or documented (IRCW 2007). In Ethiopia, a recent land titling scheme introduced pictures of both husband and spouse in passport size booklets to ensure women are represented and identified as joint owners (Deininger et al. 2007). The International Center for Research on Women is piloting programs which train grassroots paralegals to help women defend their property rights in Uganda, however results from this effort are still forthcoming.[24] Finally, property inheritances among orphans and child-headed households and among women in post-conflict situations are areas which require more evidence and attention on the research agenda (UN 2001; UNIFEM 2001; Rose 2006; International Committee of the Red Cross 1999). Although the problem of property grabbing and 'plight' of widows in SSA is often framed in a human rights perspective and has legitimacy on this basis alone, quantitative research and evidenced-based program evaluation should be pursued in parallel to identify if progress is being made and identify successful program designs to protect women's inheritance rights and to protect against falling into poverty.

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X. Tables in text

Table 1: Sample sizes and percentages of widows inheriting assets in sub-Saharan Africa by country

	Pooled sample	Benin (2006)	Congo (2005)	DRC (2007)	Guinea (2005)	Mali (2006)	Namibia (2006/7)	Niger (2006)	Nigeria (2008)	Rwanda (2005)	Tanz (2004)	Senegal (2005)	Sierra Leone (2008)	Uganda (2006)	Zambia (2007)	Zim (2005/6)
Ever widowed (% full sample)	5.03	4.31	3.33	3.98	7.29	4.73	3.22	4.12	3.88	7.19	4.30	4.13	7.91	6.36	7.12	9.06
Ever widowed (% ever married sample)	6.71	5.38	4.72	5.25	8.73	5.37	7.65	4.57	5.18	11.53	5.59	5.65	9.77	8.34	9.62	12.41
Sample size ever widowed	8725	727	226	412	555	637	343	370	1283	779	426	611	563	546	484	763
Inherited any assets (%)	46.95	27.29	24.49	30.63	36.66	40.01	59.91	48.53	56.73	65.61	52.92	57.10	21.88	51.06	48.73	56.22
Who inherited majority of assets?																
Widow/widow's children (%)	31.94	21.90	15.81	23.80	25.40	28.86	29.40	23.75	27.87	59.96	38.06	46.24	12.65	36.41	31.77	37.31
Other wife (%)	3.52	2.26	0.75	2.90	5.93	2.83	2.11	3.24	4.44	4.74	2.06	3.56	5.44	6.49	0.98	1.60
Spouse's children/family (%)	48.41	56.05	64.61	62.73	52.02	50.52	60.69	52.07	57.16	6.58	47.11	28.67	55.35	48.90	57.82	50.92
Other relative/person (%)	8.19	2.48	5.11	10.57	16.64	4.40	2.09	20.94	4.99	28.71	3.20	7.59	6.96	2.27	1.55	3.47
Husband had no property (%)	7.93	17.31	13.72	0.00	0.00	13.40	5.72	0.00	5.54	0.00	9.57	13.94	19.59	5.92	7.89	6.70

Note: Sample is among women ages 15 to 49 and mean values are weighted according to population-level weights provided in the DHS.

Table 2: Bivariate analysis of background characteristics and inheritance of any assets by widows in sub-Saharan Africa and by country

A. Cultural and demographic	Pooled sample	Benin (2006)	Congo (2005)	DRC (2007)	Guinea (2005)	Mali (2006)	Namibia (2006/7)	Niger (2006)	Nigeria (2008)	Rwanda (2005)	Tanz (2004)	Senegal (2005)	Sierra Leone (2008)	Uganda (2006)	Zambia (2007)	Zim (2005/6)
Age groups (in years)																
15 to 29 (=1)	0.38	0.16	0.12	0.30	0.41	0.37	0.44	0.34	0.50	0.31	0.47	0.52	0.14	0.41	0.48	0.44
30 to 34 (=1)	0.44	0.23	0.30	0.23	0.30	0.30	0.70	0.52	0.53	0.50	0.58	0.59	0.19	0.50	0.51	0.53
35 to 39 (=1)	0.45	0.26	0.14	0.23	0.32	0.40	0.67	0.53	0.53	0.64	0.40	0.53	0.22	0.53	0.53	0.57
40 to 44 (=1)	0.51	0.26	0.25	0.41	0.44	0.37	0.53	0.62	0.57	0.77	0.55	0.54	0.29	0.60	0.52	0.59
45 and above (=1)	0.51	0.34	0.34	0.32	0.36	0.49	0.62	0.42	0.62	0..79	0.60	0.65	0.21	0.49	0.40	0.67
p-value	***0.000***	***0.022***	*0.079*	*0.292*	*0.250*	*0.076*	*0.071*	***0.022***	*0.078*	***0.000***	*0.105*	*0.400*	*0.235*	*0.199*	*0.396*	***0.003***
Muslim religion (=1)	0.46	0.27	0.00	0.02	0.41	0.42	0.00	0.49	0.66	0.61	0.55	0.58	0.20	0.53	0.00	0.43
p-value	*0.121*	*0.996*	***0.000***	***0.000***	***0.000***	***0.001***	--	*0.509*	***0.000***	*0.711*	*0.681*	*0.446*	*0.130*	*0.841*	***0.000***	*0.621*
Ethnicity (varies, p-value)	--	***0.006***	*0.083*	***0.048***	***0.001***	***0.040***	--	*0.936*	***0.000***	--	--	*0.310*	***0.010***	--	*0.068*	--
Any children (=1)	0.48	0.28	0.25	0.30	0.37	0.42	0.60	0.50	0.57	0.67	0.53	0.59	0.21	0.53	0.49	0.57
p-value	***0.000***	*0.100*	*0.915*	*0.638*	*0.624*	*0.079*	*0.713*	*0.074*	*0.069*	***0.000***	*0.924*	***0.035***	*0.296*	***0.004***	*0.950*	*0.132*
Total fertility rate (p-value)	***0.001***	*0.072*	*0.543*	*0.631*	*0.444*	*0.763*	*0.224*	*0.675*	*0.065*	***0.000***	*0.748*	*0.596*	*0.571*	***0.007***	*0.384*	*0.533*
Polygamous union (=1)	0.40	0.20	0.32	0.27	0.36	0.36	0.12	0.64	0.51	0.53	0.45	0.58	0.16	0.42	0.30	0.40
p-value	***0.000***	***0.000***	*0.419*	*0.616*	*0.873*	*0.182*	***0.000***	***0.000***	***0.014***	***0.016***	*0.138*	*0.749*	***0.009***	***0.044***	***0.007***	*0.078*
B. Economic																
Education levels																
No schooling (=1)	0.43	0.27	0.28	0.34	0.36	0.39	0.39	0.48	0.60	0.69	0.54	0.56	0.21	0.46	0.47	0.38
Primary (=1)	0.50	0.23	0.29	0.28	0.41	0.39	0.60	0.44	0.52	0.63	0.52	0.60	0.20	0.54	0.44	0.54
Secondary or above (=1)	0.54	0.37	0.21	0.32	0.46	0.58	0.67	0.80	0.58	0.70	0.54	0.68	0.29	0.55	0.63	0.62
p-value	***0.000***	*0.285*	*0.596*	*0.702*	*0.603*	*0.177*	***0.005***	***0.016***	*0.087*	*0.193*	*0.979*	*0.656*	*0.498*	*0.282*	***0.004***	***0.003***
Wealth quintiles																
First quintile (=1)	0.43	0.27	0.20	0.40	0.32	0.23	0.47	0.47	0.58	0.70	0.50	0.52	0.21	0.44	0.44	0.43
Second quintile (=1)	0.45	0.34	0.21	0.18	0.35	0.37	0.69	0.40	0.58	0.64	0.50	0.50	0.24	0.55	0.34	0.44
Third quintile (=1)	0.45	0.29	0.30	0.19	0.32	0.39	0.53	0.55	0.52	0.64	0.57	0.62	0.16	0.50	0.44	0.46
Fourth quintile (=1)	0.49	0.20	0.28	0.39	0.41	0.50	0.72	0.50	0.55	0.63	0.61	0.62	0.21	0.42	0.54	0.63
Fifth quintile (=1)	0.55	0.24	0.25	0.34	0.46	0.50	0.76	0.52	0.66	0.66	0.44	0.57	0.28	0.71	0.61	0.78
p-value	***0.000***	*0.115*	*0.844*	***0.013***	*0.255*	***0.000***	***0.006***	*0.644*	*0.134*	*0.675*	*0.409*	*0.258*	*0.493*	***0.002***	***0.004***	***0.000***
C. Locational																
Urbanicity (=1)	0.50	0.23	0.25	0.35	0.45	0.51	0.66	0.48	0.59	0.63	0.50	0.60	0.24	0.51	0.56	0.73
p-value	***0.001***	*0.067*	*0.827*	*0.295*	***0.035***	***0.018***	*0.186*	*0.908*	*0.363*	*0.428*	*0.521*	*0.340*	*0.457*	*0.974*	***0.003***	***0.000***
Region (varies, p-value)	--	***0.003***	*0.586*	***0.007***	***0.000***	***0.004***	***0.015***	*0.140*	***0.000***	*0.077*	*0.818*	***0.020***	***0.010***	***0.000***	***0.044***	***0.000***

Note: Sample is among women ages 15 to 49. Bold indicates significant at the p<0.05 level. Mean values and adjusted wald tests use weights according to population-level weights provided in the DHS. Regional indicators are not displayed and vary by country, note that ethnicity is not available in Namibia, Rwanda, Tanzania, Uganda and Zimbabwe.

Table 3: Bivariate analysis of background characteristics and inheritance of any assets by widows in sub-Saharan Africa and by country

A. Cultural and demographic	Pooled sample	Benin (2006)	Congo (2005)	DRC (2007)	Guinea (2005)	Mali (2006)	Namibia (2006/7)	Niger (2006)	Nigeria (2008)	Rwanda (2005)	Tanz (2004)	Senegal (2005)	Sierra Leone (2008)	Uganda (2006)	Zambia (2007)	Zim (2005/6)
Age groups (in years)																
15 to 29 (=1)	0.24	0.08	0.12	0.25	0.28	0.36	0.23	0.17	0.21	0.28	0.34	0.34	0.10	0.26	0.31	0.24
30 to 34 (=1)	0.29	0.19	0.18	0.15	0.19	0.23	0.33	0.17	0.27	0.45	0.46	0.46	0.09	0.38	0.37	0.30
35 to 39 (=1)	0.32	0.22	0.09	0.20	0.24	0.27	0.43	0.33	0.30	0.55	0.25	0.43	0.13	0.42	0.30	0.41
40 to 44 (=1)	0.36	0.20	0.12	0.32	0.32	0.23	0.28	0.28	0.29	0.72	0.42	0.46	0.19	0.42	0.36	0.47
45 and above (=1)	0.33	0.28	0.23	0.23	0.24	0.34	0.22	0.23	0.28	0.74	0.42	0.55	0.10	0.34	0.27	0.43
p-value	***0.000***	***0.000***	*0.412*	*0.411*	*0.297*	*0.224*	*0.147*	*0.254*	*0.261*	***0.000***	*0.058*	*0.204*	*0.238*	*0.145*	*0.594*	***0.000***
Muslim religion (=1)	0.28	0.21	0.00	0.02	0.28	0.30	0.00	0.24	0.18	0.53	0.32	0.46	0.12	0.53	0.00	0.43
p-value	***0.000***	*0.509*	***0.000***	***0.000***	***0.008***	***0.002***	--	***0.000***	***0.000***	*0.581*	*0.231*	*0.871*	*0.363*	*0.841*	***0.000***	*0.845*
Ethnicity (varies, p-value)	--	***0.002***	*0.141*	***0.027***	*0.182*	***0.002***	--	*0.292*	***0.000***	--	--	*0.436*	***0.015***	--	*0.271*	--
Any children (=1)	0.33	0.22	0.16	0.23	0.26	0.29	0.29	0.24	0.28	0.61	0.39	0.48	0.12	0.38	0.32	0.38
p-value	***0.000***	*0.273*	*0.975*	*0.672*	*0.140*	*0.553*	*0.473*	*0.844*	*0.260*	***0.000***	*0.375*	*0.070*	*0.428*	***0.000***	*0.605*	*0.296*
Total fertility rate (parity)	***0.024***	***0.016***	***0.027***	*0.591*	*0.582*	*0.683*	*0.246*	*0.936*	*0.059*	***0.000***	*0.898*	*0.655*	*0.830*	***0.010***	*0.589*	*0.817*
Polygamous union (=1)	0.24	0.14	0.12	0.23	0.23	0.26	0.12	0.26	0.12	0.47	0.37	0.46	0.09	0.29	0.11	0.18
p-value	***0.000***	***0.000***	*0.622*	*0.912*	*0.161*	*0.275*	***0.024***	*0.447*	***0.000***	***0.020***	*0.910*	*0.908*	***0.053***	*0.101*	***0.000***	***0.015***
B. Economic																
Education levels																
No schooling (=1)	0.28	0.23	0.19	0.24	0.24	0.28	0.23	0.25	0.21	0.60	0.43	0.44	0.13	0.34	0.28	0.23
Primary (=1)	0.35	0.14	0.19	0.25	0.32	0.26	0.28	**0.13**	0.30	0.59	0.36	0.55	0.05	0.38	0.29	0.36
Secondary or above (=1)	0.37	0.22	0.13	0.23	0.43	0.47	0.34	0.47	0.40	0.68	0.29	0.61	0.21	0.36	0.41	0.42
p-value	***0.000***	*0.076*	*0.586*	*0.975*	*0.170*	*0.182*	*0.351*	***0.036***	***0.000***	*0.313*	*0.389*	*0.220*	***0.006***	*0.654*	*0.087*	***0.009***
Wealth quintiles																
First quintile (=1)	0.29	0.22	0.09	0.34	0.23	0.12	0.17	0.29	0.25	0.63	0.30	0.36	0.10	0.34	0.27	0.32
Second quintile (=1)	0.28	0.31	0.17	0.14	0.23	0.25	0.34	0.14	0.21	0.59	0.38	0.42	0.15	0.35	0.19	0.23
Third quintile (=1)	0.32	0.21	0.27	0.17	0.25	0.25	0.26	0.18	0.31	0.57	0.42	0.47	0.14	0.39	0.26	0.30
Fourth quintile (=1)	0.33	0.14	0.14	0.23	0.24	0.40	0.42	0.32	0.27	0.57	0.50	0.55	0.11	0.27	0.35	0.40
Fifth quintile (=1)	0.40	0.20	0.07	0.24	0.35	0.41	0.46	0.24	0.42	0.62	0.26	0.53	0.16	0.52	0.45	0.56
p-value	***0.000***	***0.028***	*0.235*	*0.092*	*0.458*	***0.000***	***0.006***	*0.184*	***0.002***	*0.783*	***0.050***	*0.113*	*0.724*	***0.047***	***0.004***	***0.000***
C. Locational																
Urbanicity (=1)	0.36	0.19	0.12	0.26	0.33	0.42	0.41	0.25	0.32	0.60	0.34	0.52	0.15	0.36	0.40	0.50
p-value	***0.000***	*0.137*	*0.297*	*0.501*	***0.037***	***0.010***	***0.010***	*0.759*	*0.063*	*0.570*	*0.405*	***0.050***	*0.378*	*0.960*	***0.001***	***0.000***
Region (varies, p-value)	--	***0.002***	*0.244*	***0.011***	***0.002***	***0.003***	***0.028***	***0.010***	***0.000***	***0.027***	*0.128*	***0.021***	***0.024***	***0.000***	***0.001***	***0.000***

Note: Sample is among women ages 15 to 49. Bold indicates significant at the p<0.05 level. Mean values and adjusted wald tests use weights according to population-level weights provided in the DHS. Regional indicators are not displayed and vary by country, note that ethnicity is not available in Namibia, Rwanda, Tanzania, Uganda and Zimbabwe.

Table 4: Descriptive statistics on poverty measures, inheritance and marital status in Kagera (sample women age>=15 in 1991 survey)

	(A) Full sample	(B) Full sample	(C) Ever widowed women	(D) Never widowed women	(E) p-value (C) = (D)
Welfare measures	(1991)	(2004)	(2004)	(2004)	
Per capita consumption	164.52	210.69	202.50	214.40	*0.3554*
	[115.86]	[183.33]	[151.17]	[196.17]	
Value of household asset stocks	693.62	2289.16	3039.89	1948.96	*0.3146*
	[3758.29]	[15447.88]	[25825.46]	[6700.81]	
Inheritance measures					
Any inheritance (=1)	--	0.065	0.061	0.066	*0.7705*
Total value of inheritance	--	59.32	88.02	46.31	*0.4807*
	--	[842.11]	[993.36]	[764.28]	
Value of cash inheritance	--	4.08	2.79	4.66	*0.7923*
	--	[101.08]	[47.69]	[117.58]	
Value of in-kind inheritance	--	21.09	32.58	15.88	*0.5329*
	--	[381.20]	[481.76]	[325.89]	
Value of land inheritance	--	34.16	52.65	25.77	*0.3472*
	--	[407.24]	[537.86]	[331.72]	
Marital status					
Widow (=1)	0.151	0.290	0.929	0.000	--
Never married (=1)	0.279	0.043	0.000	0.390	--
Separated/divorced (=1)	0.088	0.109	0.020	0.149	--
Union (=1)	0.481	0.558	0.051	0.538	--
Sample size (N)	946	946	295	651	

Mean values reported with standard deviations where appropriate below in [ ]'s. All values are logged in analysis to account for skewed distributions and are reported as unlogged for presentation only.

Note: All poverty and inheritance measures calculated at the household level, reported in 1,000's of Tanzanian shillings and deflated to baseline (1991) nominal values using the methodology described in section IIIc and footnote 14.

Table 5. Regression results for the effect of inheritance on welfare status in Kagera (sample women age>=15 in 1991 survey)

	Log per capita consumption (ln tsh)			Log value of household asset stocks (ln		
	(A1)	(A2)	(A3)	(B1)	(B2)	(B3)
	Cross-section	Cross-section with community-level FE	Panel with individual-level FE	Cross-section	Cross-section with community-level FE	Panel with individual-level FE
	(2004)	(2004)	(1991-2004)	(2004)	(2004)	(1991-2004)
Log of inheritance value (ln tsh)	0.0266	0.0253	0.0461	0.140	0.137	0.0955
	(0.0130)**	(0.0113)**	(0.0179)***	(0.0369)***	(0.0402)***	(0.0544)*
Widow (=1)	-0.154	-0.186	-0.0674	-0.744	-0.688	-0.835
	(0.0453)***	(0.0445)***	-0.0642	(0.142)***	(0.126)***	(0.174)***
Never married (=1)	0.160	0.0511	-0.189	0.0814	-0.0851	0.278
	(0.0887)*	-0.0984	(0.0604)***	-0.217	-0.298	(0.151)*
Separated/divorced (=1)	-0.147	-0.179	-0.0783	-0.977	-0.942	-0.685
	(0.0553)***	(0.0511)***	-0.0729	(0.210)***	(0.208)***	(0.225)***
Age (in years)	0.00415	0.00448	0.00588	0.0314	0.03	0.0822
	(0.00149)***	(0.00142)***	(0.00260)**	(0.00457)***	(0.00447)***	(0.00681)***
Incomplete primary schooling (=1)	0.231	0.192	0.100	0.413	0.336	0.411
	(0.0457)***	(0.0475)***	-0.0621	(0.143)***	(0.172)*	(0.184)**
Complete primary schooling (=1)	0.305	0.268	0.198	0.42	0.436	0.373
	(0.0496)***	(0.0523)***	(0.0798)**	(0.142)***	(0.157)***	(0.217)*
Secondary or above schooling (=1)	0.948	0.775	0.508	1.400	1.341	0.649
	(0.0974)***	(0.0974)***	(0.151)***	(0.222)***	(0.216)***	(0.347)*
Muslim (=1)	0.114	0.0689	--	-0.438	-0.381	--
	(0.0526)**	-0.0651	--	(0.178)**	(0.150)**	--
Christian or other religion (=1)	-0.0966	-0.102	--	-0.062	-0.0514	--
	(0.0374)***	(0.0397)**	--	-0.121	-0.146	--
Nyambo tribe (=1)	0.159	-0.0394	--	0.32	-0.194	--
	(0.0530)***	-0.121	--	(0.165)*	-0.387	--
Hangaza tribe (=1)	-0.371	-0.324	--	-0.328	-0.586	--
	(0.0544)***	(0.159)**	--	(0.165)**	-0.539	--
Other tribe (=1)	-0.208	7.68E-06	--	-0.759	-0.447	--
	(0.0555)***	-0.0658	--	(0.147)***	(0.256)*	--
Log household size (ln members)	-0.743	-0.744	0.871	1.531	1.542	1.205
	(0.0432)***	(0.0402)***	(0.366)**	(0.133)***	(0.163)***	-0.864
Sample size (N)	946	946	1859	946	946	1859
R-squared	0.424	0.397	0.112	0.315	0.285	0.213

Note: OLS regressions, coefficients reported with robust standard errors in ( )'s. *** p<0.01, ** p<0.05, * p<0.1

Also included but not reported are seasonal indicators found in Table A2. All values in Tsh are in 1,000's of Tanzanian shillings and deflated to baseline (1991) nominal values using the methodology described in section IIIc and footnote 14.

Table 6. Summary of regression results for the effect of inheritance on welfare status in Kagera by widowhood status

Panel A: Log per capita consumption (ln tsh)						
	Cross-section		Cross-section with community- level FE		Panel with individual-level FE	
	(A1)	(A2)	(B1)	(B2)	(C1)	(C2)
	Ever widowed	Never widowed	Ever widowed	Never widowed	Ever widowed	Never widowed
	(2004)	(2004)	(2004)	(2004)	(1991-2004)	(1991-2004)
Log of inheritance value (ln tsh)	0.0485	0.0148	0.0408	0.0167	0.0751	0.0301
	(0.0218)**	(0.015)	(0.0216)*	(0.016)	(0.0253)***	(0.023)
Sample size (N)	295	651	295	651	573	1286
R-squared	0.375	0.458	0.371	0.455	0.079	0.138
Panel B: Log value of household asset stocks (ln tsh)						
Log of inheritance value (ln tsh)	0.174	0.114	0.173	0.119	0.132	0.0652
	(0.0689)**	(0.0406)***	(0.0671)***	(0.0509)**	(0.085)	(0.070)
Sample size (N)	295	651	295	651	573	1286
R-squared	0.308	0.332	0.307	0.331	0.177	0.252

Note: OLS regressions, coefficients reported with robust standard errors in ( )'s. *** p<0.01, ** p<0.05, * p<0.1

Also included but not reported are all control variables as in Table 5 and seasonal indicators found in Table A2. All values in Tsh are in 1,000's of Tanzanian shillings and deflated to baseline (1991) nominal values using the methodology described in section IIIc and footnote 14.

XI. Appendix

Table A1: Descriptive statistics on cultural, demographic, economic and locational background characteristics among widows in sub-Saharan Africa and by country

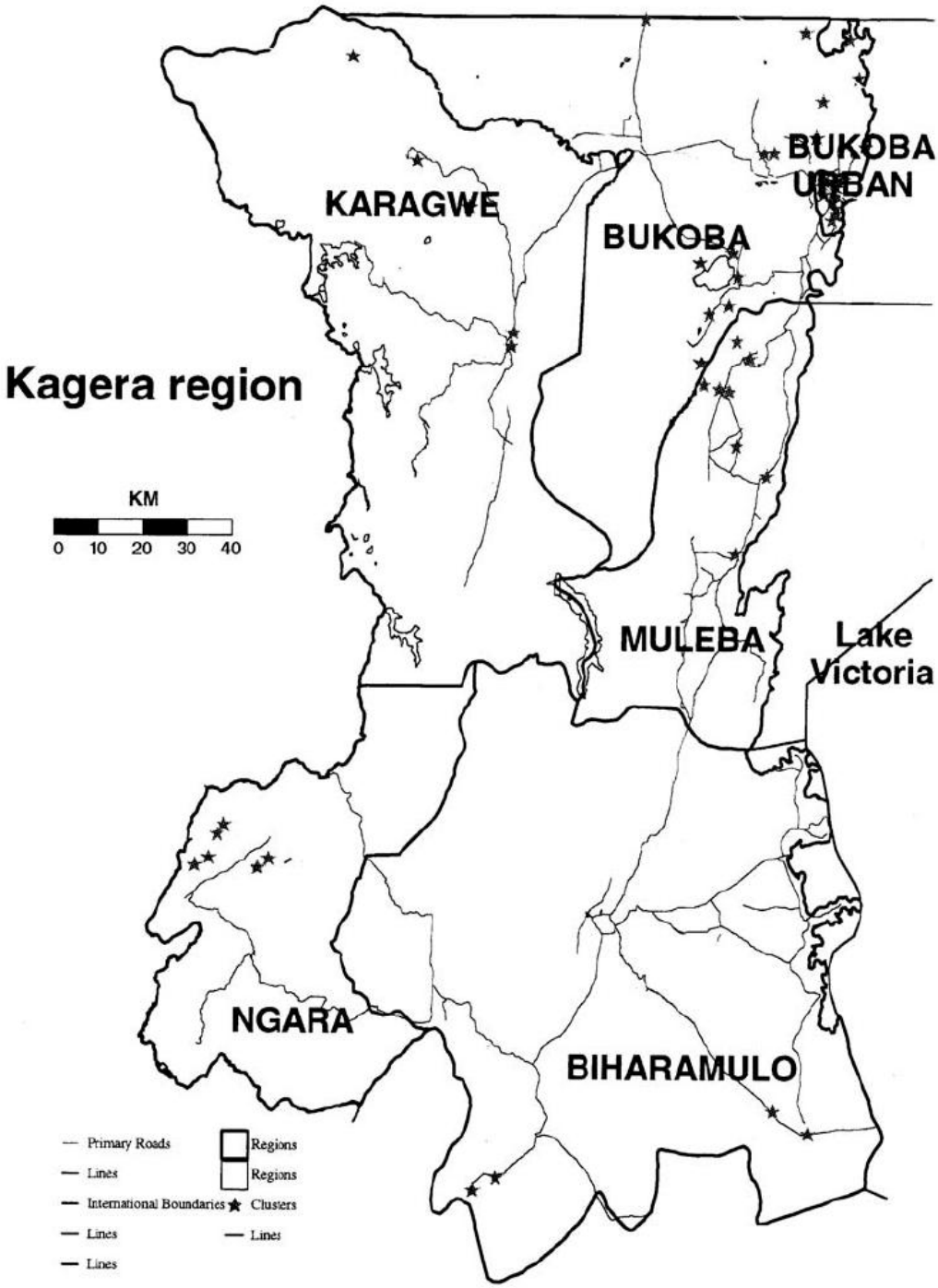
A. Cultural and demographic	Pooled sample	Benin (2006)	Congo (2005)	DRC (2007)	Guinea (2005)	Mali (2006)	Namibia (2006/7)	Niger (2006)	Nigeria (2008)	Rwanda (2005)	Tanz (2004)	Senegal (2005)	Sierra Leone (2008)	Uganda (2006)	Zambia (2007)	Zim (2005/6)
Age groups (in years)																
15 to 29 (=1)	0.13	0.11	0.14	0.12	0.11	0.18	0.08	0.23	0.12	0.09	0.14	0.13	0.12	0.15	0.14	0.18
30 to 34 (=1)	0.15	0.13	0.15	0.15	0.14	0.12	0.15	0.18	0.11	0.19	0.18	0.13	0.14	0.15	0.19	0.19
35 to 39 (=1)	0.21	0.19	0.19	0.21	0.22	0.18	0.16	0.19	0.17	0.20	0.20	0.21	0.27	0.21	0.23	0.24
40 to 44 (=1)	0.23	0.21	0.21	0.23	0.22	0.23	0.31	0.22	0.24	0.29	0.20	0.26	0.22	0.20	0.21	0.20
45 and above (=1)	0.28	0.35	0.32	0.28	0.31	0.28	0.30	0.18	0.36	0.24	0.28	0.27	0.24	0.28	0.22	0.19
Muslim religion (=1)	0.37	0.13	0.01	0.02	0.81	0.93	0.00	0.98	0.37	0.02	0.23	0.96	0.79	0.38	0.01	0.01
Any children (=1)	0.92	0.95	40.81	0.92	0.91	0.91	0.91	0.91	0.92	0.94	0.95	0.92	0.93	0.92	0.90	0.87
Total fertility rate (parity)	5.19	5.60	4.33	5.24	5.26	5.73	4.18	5.49	5.51	5.04	5.36	5.64	4.94	5.92	5.02	3.82
Polygamous union (=1)	0.27	0.38	0.13	0.20	0.51	0.51	0.03	0.38	0.26	0.11	0.20	0.52	0.34	0.17	0.10	0.04
B. Economic																
Education levels																
No schooling (=1)	0.51	0.79	0.17	0.31	0.88	0.86	0.14	0.86	0.47	0.36	0.34	0.80	0.81	0.38	0.13	0.11
Primary (=1)	0.32	0.15	0.28	0.42	0.08	0.08	0.46	0.12	0.34	0.54	0.63	0.16	0.10	0.53	0.62	0.44
Secondary or above (=1)	0.16	0.06	0.55	0.27	0.04	0.06	0.41	0.02	0.19	0.11	0.04	0.05	0.09	0.09	0.24	0.46
Wealth quintiles																
First quintile (=1)	0.23	0.25	0.20	0.32	0.24	0.19	0.32	0.21	0.22	0.24	0.26	0.52	0.23	0.26	0.15	0.19
Second quintile (=1)	0.21	0.22	0.27	0.23	0.20	0.18	0.22	0.14	0.23	0.22	0.20	0.19	0.20	0.23	0.17	0.16
Third quintile (=1)	0.21	0.20	0.22	0.14	0.22	0.21	0.21	0.21	0.25	0.20	0.22	0.21	0.19	0.21	0.17	0.19
Fourth quintile (=1)	0.20	0.20	0.17	0.13	0.19	0.25	0.15	0.21	0.20	0.16	0.21	0.26	0.24	0.17	0.28	0.24
Fifth quintile (=1)	0.16	0.14	0.13	0.18	0.15	0.17	0.10	0.22	0.11	0.18	0.12	0.14	0.14	0.13	0.23	0.22
C. Locational																
Urbanicity (=1)	0.30	0.36	0.43	0.38	0.25	0.30	0.31	0.21	0.27	0.18	0.22	0.42	0.28	0.13	0.50	0.37

Note: Sample is among women ages 15 to 49. Mean values and adjusted wald tests use weights according to population-level weights provided in the DHS. Ethnic and regional indicators are not displayed and vary by country.

Table A2: Descriptive statistics on control variables used in Kagera regression analysis (sample women age>=15 in 1991 survey)

	(A) Full sample	(B) Full sample	(C) Ever widowed women	(D) Never widowed women
Control variable	(1991)	(2004)	(2004)	(2004)
Age (in years)	33.76	46.30	60.58	39.83
	[16.43]	[16.89]	[16.31]	[12.66]
Education levels				
No schooling (omitted = 1)	0.29	0.32	0.51	0.23
Incomplete primary schooling (=1)	0.32	0.22	0.26	0.20
Complete primary schooling (=1)	0.36	0.41	0.19	0.51
Secondary or above schooling (=1)	0.04	0.05	0.04	0.06
Religious affiliation of household head				
Catholic religion (omitted =1)	0.57	0.58	0.56	0.58
Muslim (=1)	0.13	0.12	0.13	0.12
Christian or other religion (=1)	0.29	0.30	0.31	0.29
Tribe affiliation of household head				
Haya tribe (omitted =1)	0.60	0.61	0.70	0.57
Nyambo tribe (=1)	0.13	0.12	0.09	0.13
Hangaza tribe (=1)	0.11	0.12	0.08	0.13
Other tribe (=1)	0.16	0.15	0.12	0.17
Season of interview				
Interviewed Masikara rain season (omitted =1)	0.18	0.56	0.64	0.52
Interviewed Vulani rain season (=1)	0.67	0.29	0.27	0.30
Interviewed Kiangazi season (=1)	0.15	0.15	0.09	0.18
Household size (members)	5.50	5.63	4.82	6.00
	[2.93]	[2.98]	[2.53]	[3.10]
Sample size (N)	946	946	295	651
Mean values reported with standard deviations where appropriate below in [ ]'s.				

Figure A1. Location of survey clusters in the KHDS



Source: (Beegle, De Weerdt, & Dercon, 2006)