

Draft 2

Welfare Effects of Widowhood in a Poor Country

Dominique van de Walle^{*}

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The plight of Africa's many widows has largely been ignored in the work of economists and in policy discussions and actions. In particular, the situation of ever-widowed women who have remarried or been in some way absorbed into male headed households along with, or sometimes without, their dependent children has received scant attention. A review of evidence on the situation of women in Mali suggests that they are more vulnerable and less able to mitigate and cope with downside risk than men. Women in Malian society appear to be exceptionally vulnerable to the loss of husbands especially in rural areas. An analysis of available household consumption data indicates that households headed by widows have significantly lower living standards than all other male or female headed households in both rural and urban areas. This holds both unconditionally and conditional on observable household and individual characteristics including age. An examination of individual measures of well-being further reveals that, relative to other women, worse outcomes for ever-widowed women persist through remarriage. Furthermore, these detrimental effects are passed onto children, suggesting an intergenerational transmission of poverty stemming from widowhood.

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1. Introduction

There are a number of reasons why gender may matter to vulnerability. Studies around the world have shown that individuals within the same household do not always have the same living standards: income and resources are not necessarily pooled and members do not share in them equally.¹

One implication is that individuals within a given household will not be equally vulnerable to shocks — whether the shock is to themselves or to the entire household (Dercon and Krishnan 2000). Different members can bear different costs of any given household shock. Their ability to protect themselves will also differ — with some members being less resilient, less able to cope and in command of fewer options for dealing with shocks than others. Gender and age are arguably the most prominent individual attributes along which differentiation takes place within the household. Such differentiation often also occurs across different types of households such as, for example, those headed by women and those headed by men.

This paper focuses on the welfare impacts on women and their children of a potentially severe shock — widowhood — in Mali, a very poor, primarily rural (70% of the population) West African Sahelian country. With the exception of recent work on surviving spouses and children in the context of widespread HIV/AIDS deaths in certain countries and a few studies on gendered asset inheritance, economists have given surprisingly little attention to the situation of widows in Africa. The literature on vulnerability and safety nets barely mentions them. Yet elsewhere where there is weak legal and economic equality between the sexes and wives are largely dependent on husbands, most notably in India, widows have been found to be particularly discriminated against and disadvantaged (Chen 2000, Drèze and Srinivasan 1997, Jensen 2005).

¹ Ezememari, Chaudhury and Owens (2002) review the literature.

This was true too in Western countries and a major impetus for the introduction of state-mandated widows' pensions and existing systems of social security.

Naturally, the circumstances of Malian women (and of Malian widows) vary, including across geographic — particularly urban and rural — areas, by income and education levels and by ethnic group. This paper focuses primarily on poor rural, and less so on poor urban, women. Although recognizing that heterogeneity exists within these groups, some robust patterns appear to be generalizable. What emerges clearly is that even among poor women, some are considerably more vulnerable than others. In a country where dependency on men — first one's father and then one's husband — is embedded in the law and culture, one might expect shocks such as losing a father or becoming a widow to be closely associated with worse living standards and current poverty. The paper presents empirical evidence that confirms this hypothesis. However, the paper also presents evidence suggesting that the disadvantages and poverty faced by widows have longer lasting deleterious welfare and growth consequences by way of their dependents, even when the widow remarries.

Drawing on the literature, the following section details the various forms gender differentiation within and across households can take and how this may result in heightened vulnerability. In this context, the role and existence of mitigating social safety nets in Mali is also discussed. Sections 3 and 4 then turn to the quantitative data for this study with analyses of the 2006 Enquête Légère Intégrée Auprès des Ménages (ELIM) and Demographic and Health Survey (DHS) for 2006, respectively. As one way to get at these issues with existing household level data, Section 3 first examines female headed households and whether they are poorer than male headed households and under what circumstances. This leads me to focus on a specific shock — namely widowhood. Using the DHS in Section 4, the paper finds suggestive evidence

that gender differentiation has a particularly significant and negative effect for ever-widowed and less-so for ever-divorced women. A final section concludes.

2. The vulnerability of women in Mali

Welfare relevant gender differences can be identified along a number of dimensions, including: legal protection, individual endowments, preferences, constraints stemming from social norms (for example, on options outside the household), and access to and control over household and community assets and resources. Such gender differences within the household also interact with age in influencing welfare outcomes, including inequality between men and women and the welfare effects of shocks.

Legal protection in Mali and in many Sahelian West African countries privileges men. Inheritance and marriage continue to be controlled by customary law under which individual rights and particularly women's rights are often denied in favor of preserving tradition (Wing 2009).² This has left women's rights in these realms largely unprotected. Traditional law as practiced in Mali, dictates that daughters inherit only half of what sons inherit and husbands are the sole owners of family property. Single women typically have few rights. Marriage accords them protection and some rights such as the use of a plot of land. Yet, as discussed below, these rights are contingent on marital status and lost through divorce/separation and widowhood. Given the large age gap between spouses — around 12 and 14 years on average in urban and rural Mali, respectively (ELIM 2006) — many young women find themselves widows with few rights

² A new family law code which strengthens the rights of women and sets the legal age of marriage at 18 was passed in the National Assembly in 2008 but has not been implemented due to massive demonstrations and vociferous opposition.

once the husband is no longer there to protect and provide for them.³ In this situation, widows usually remarry, but may well face worse circumstances — as may their children — and have fewer choices than for their first marriage.

As we shall see below, currently married but previously widowed or divorced women are in a number of respects worse off than women of other marital statuses, controlling for age. Leviratic unions — whereby a widow ‘marries’ into the husband’s lineage — have traditionally provided support to widows and their children by ensuring that a male provider assumes responsibility for them.⁴ The levirate also makes it easier for mother and children to stay together. In most cases, and particularly when bride wealth has been paid, a man’s offspring are seen to belong to his lineage. Although a widow can refuse the levirate, she is not free to take the children she has had with the deceased husband away with her. Furthermore, a new husband from outside the lineage will frequently not accept her children with another man.⁵ Although the levirate continues to be extensively practiced in rural Mali, in some places the system is eroding without adequate alternative livelihood opportunities for women who have been left-behind by a male protector. Without the necessary social, economic and legal changes, women remain without practical opportunities to support themselves. In addition, given the large age gap at marriage between men and women in Mali, only 48 percent of women 60 and above are married compared to 90 percent of men (Commission on Population and Development, 2000). There are considerably more widows than widowers. Indeed, 3 percent of men aged 56 and older are

³ These average age differences are calculated for household heads and their spouses. Note that the age gaps are larger for polygamous than for monogamous unions.

⁴ Two practices are found and often referred to interchangeably in the literature: widow inheritance and levirate (Kirwen 1979, writing about Tanzania). In the first, the widow becomes the legal wife of the inheritor, a male relative of the husband, often a brother. In the levirate, the widow remains married to the dead husband and cohabits with the husband’s male relative who becomes a substitute husband. Any offspring are considered children of the dead husband’s. These customs have been altered by many forces and it is not entirely clear which form the practice has taken in Mali. In common with much of the literature, I will use the term levirate to mean either practice.

⁵ This issue and its frequency were often mentioned to me as resulting in major disadvantage for children and women in discussions I had in Bamako in December 2010.

identified as widowers versus 52 percent of women in the same age group in the 2006 ELIM data.

Malian women tend to have different, and typically significantly inferior, human capital endowments to men. According to the 2006 DHS, only 17 percent of Malian women are literate compared to 37 percent of men; the breakdown for rural and urban areas is 8 versus 26 percent, and 35 versus 61 percent, respectively.⁶ An alarming 88 percent of rural women have had no schooling at all. This is true also of 59 percent of urban women. Although the percentages of men without instruction are also high at 69 and 39 percent in rural and urban areas, they still fare considerably better in this respect than women. Far fewer girls attend school: the ratio of girl to boy attendance is 75 percent at the primary school level and only 35 percent at the secondary school level. Greater illiteracy and lower educational attainments generally, place stronger limitations on women's access to employment and government services. Malian women also face pronounced health risks and complications associated with the near universal practice of girls' circumcision in often unsanitary conditions, and repeated child bearing as adults. A woman has 6 to 7 births on average, and these are associated with high rates of maternal mortality — 670 deaths per 100,000 live births in 2008 (Hogan et al., 2010) — as well as pronounced morbidity. At 250 per 1000 births, rates of infant mortality are also extremely high. Demographic and Health Surveys indicate high rates of anemia. On the whole, women are likely to suffer from lower physical resilience to shocks for a substantial part of their adult lives.

A number of studies in various countries have also suggested that men and women may have different preferences (Croson and Gneezy 2009; Tertilt and Doepke 2010) although it is

⁶ The DHS defines adult women as aged 15 to 49 and adult men, as between 15 and 59 years of age.

difficult to disentangle preferences from constraints.⁷ For example, men are often found to spend more of their incomes on themselves, while women tend to spend more of theirs on their children and on household nutrition and health care more generally (for example, see Schultz 1990, Thomas 1990 and Duflo 2003; Tertilt and Doepke 2010 review the literature). They may also deprive themselves more in order to protect their children's nutrition and health following a shock. Overall, the evidence suggests that households are likely to pool some resources, along with some retention of own income by individual members. In this case, access to one's own income sources as well as the strength of one's bargaining power within the household becomes crucial to welfare outcomes.

Important gender differences also exist in the access and control over resources in Malian society. Women in Mali are highly dependent on men — the responsibility first of fathers, and then husbands and if widowed adult sons (with luck). They marry very young — legally as young as 11 with parental consent — and typically marry much older husbands. The 2006 DHS reveals that 46, 70 and 90 percent of women were married by ages 15, 17 and 20, respectively. More than 43 percent of Malian rural families are polygamous (DHS 2006). The groom's family commonly pays bride wealth and brides move to their husband's village and extended family structure. A woman comes to a marriage with her own limited wealth—a trousseau that typically includes bedding, cooking pots, kitchen utensils and a small wardrobe that marks her new identity as a housewife.

In rural Mali, she often has few opportunities to build on those meager belongings. Traditional inheritance rules of descent favor men through whom houses and land are passed on. Women's access to property is limited and achieved primarily through their husbands. For

⁷ Note that whether gender differences in preferences are biological or due to nurture, social norms, roles and responsibilities which can be altered does not detract from their relevance in the short to medium term.

example, land use rights can only be obtained through marriage and remain contingent on marital status. In the case of divorce or widowhood, the rights are typically lost.⁸ Using the 2006 DHS, Peterman (2010) finds that only 40 percent of widows received any assets following a husband's death. The majority of the assets went to the widowed wife or her children in only 29 percent of cases.

In this culture, men and their wives do not share incomes and they keep separate budgets. In many ethnic groups such as the Bambara, men are responsible for providing the house and the grain, while women hold responsibility for the “sauce” to accompany the staple, and for themselves and their dependents (Wooten 2003; Madhavan 2001). Wives are also responsible for child care, all food preparation and other domestic tasks such as washing, cleaning, water and fuel collection. Furthermore, wives and other household members are expected to work on the household's communal land under the management of the male head — husbands, or the eldest living male in the extended family, as the case may be. Any remaining time can be devoted to the personal plot that women are allocated upon marriage and that is theirs to farm contingent on marital status. The income from this plot is expected to provide her and her dependents with any additional food and non-food needs.

Women are much more constrained than men by social norms about who does what within the household. A husband's right to restrict his wife's time allocation, mobility, labor market transactions and occupation is widely accepted and expected in rural Malian society. Although husbands can monopolize the labor of wives — for instance for work on their agricultural land plots — this right is not reciprocal. These many restrictions limit the possibilities for accumulating capital as well as the development of own-account enterprises,

⁸ Exceptions can occur, for example when there is a son who will eventually inherit but may not be of age or is currently busy with his studies or some other activity.

income earning and other opportunities for women. They reduce access to various individual level coping mechanisms such as temporary migration or labor supply adjustments — options that many men resort to in times of downside shocks.

There is some debate about whether the situation is improving or worsening with respect to rural women's access to income-earning opportunities. Some have argued that recent changes such as mounting population pressures and the advent of commercialized agriculture, have resulted in women being accorded smaller and less fertile plots by male household heads (Gray and Kevane, 1999, discussing contiguous, and in many respects similar, Burkina Faso). Wooten (2003) has argued that cash crops have led to an increase in the time women in a rural Bamana community in central Mali must spend working on household communal plots to the detriment of their own individual plots and individual income. In contrast, Lilja et al. (1996) contend that the time spent tending to commercial crops on the household's communal lands by both household and non-household labor is much better remunerated than in the past, in line with the value of the new crops. Together with new off-farm opportunities fueled by the cash crop economy, this has raised women's bargaining power and well-being.

Malian women's status is largely derived from their roles as mothers: child bearing and rearing, including getting their children a good education (Madhavan 2001). The more successful they are perceived to be in this role, the more status, autonomy and power they accumulate as they grow older. Conversely, single or infertile women and widows can be severely disadvantaged.

As a result of the above factors taken together, women have fewer assets and lower capacity for mobilizing resources than do men. This is compounded by lower access to credit and to most public and private services which also tend to favor men: extension agencies, credit,

institutions allocating agricultural inputs and outputs, marketing boards, fertilizer programs, contract farming schemes etc. In some cases, access to private transfers and informal networks may be less differentiated across gender. In a study of northern Mali, Christiaensen and Boisvert (2000) find that female-headed households are less vulnerable to drought shocks in part due to community solidarity which more readily kicks in for them. In particular, widows and married women may have access to support from brothers or uncles. Official food aid and family food transfers are found to provide significant insurance mechanisms. However, these results may not be generalizable to all of Mali. Elsewhere in West Africa, where similar questions have been posed, the opposite has been found. For example based on fieldwork in Ghana and Côte D'Ivoire, MacLean (2010) identifies patterns of reciprocity and gift giving within and across families and shows that the elderly and women participate less in them than the young and male, and thus tend to rely more on formal systems of social security than informal ones.

Using rural household data collected by IFPRI in Mali's Zone Lacustre, a few studies have examined the degree to which shocks are reflected in consumption (Skoufias and Quisumbing 2003; Harrower and Hoddinott 2004). Harrower and Hoddinott find that idiosyncratic shocks such as the illness of a prime age adult household member are not reflected in household per capita consumption regardless of the gender of the shock's recipient. However, this does not reveal whether actual individual consumption alters differentially by gender following a shock as one study found was the case in rural Southern Ethiopia. Dercon and Krishnan (2000) document imperfect risk-sharing between spouses whereby wives lose much more weight than husbands following a negative shock.

In sum, men and women may be exposed to different risks both in terms of the type and extent of the risks they face. They will also have widely different capacities to cope with risks

even within the same household (Dercon and Krishnan 2000). Formal social protection remains under-developed and piecemeal in Mali. As one might expect in a poor rural and agriculture-based economy like Mali, agro-climactic shocks are recurrent and a major concern. Naturally, most of the country's and donors' safety net programs address food security and are food based. The country maintains cereal banks and engages in public stock manipulation. Universal tax and duty exemptions are applied to some food products to help stabilize prices. In times of crisis, emergency food or cash transfer programs to households have been rolled out. In recent years, a few small, localized nutrition schemes have targeted malnourished children, pregnant women, persons infected with HIV and TB patients. Several school-feeding programs, often targeted to girls, have been implemented in selected poor areas. Recent food-for-work schemes set up by the World Food Program sometimes also target women though the programs have limited coverage. Finally, the government has a program of health fee waivers for the elderly and indigent, and for women without resources.⁹

The few, short-term, small and ad hoc targeted policies that exist often try to reach elderly women or school-aged girls, and to be gender sensitive. However, there is no sign that existing social protection schemes or policies in Mali have any focus on widows (whatever their age) or their dependents.¹⁰ Neither the government nor donors appear to be particularly concerned about this group. In the next two sections, I turn to the data to examine whether they should be more concerned.

⁹ A comprehensive review of safety net policies in Mali is given in World Bank, 2010.

¹⁰ One exception is given by the small schemes targeted to orphans and their often widowed mothers by the NGO Islamic Relief.

3. Are female-headed households poorer in Mali?

Examining whether and how the gender differentiation detailed above affects interpersonal differences in well-being is difficult empirically due to a lack of appropriate data. Individual level data detailing the intra-household allocation of resources, consumption, health, work and time allocation are typically not available. Thus, the poverty status or vulnerability of individual household members cannot be directly calculated from most household surveys. One common approach is to compare female- and male-headed households to infer effects of an individual's gender on welfare. However, female-headed households (FHH) can be extremely heterogeneous. Some have remitting adult male migrants, others are headed by poor widows who have no means of livelihood and yet others, by wealthy divorcees and other single women who have careers or other independent means of support. On balance, a majority of studies, though by no means all, find that FHH are indeed poorer in many parts of the world; see Buvinic and Rao Gupta (1997) for a review of the literature; also see Quisumbing et al., (2001). Both the latter studies note that whether and how disadvantaged FHH are is inextricably linked to why they are female headed. Detailed studies for Uganda and Zimbabwe find that households headed by widows are especially impoverished relative to male headed and other female headed households (Appleton, 1996, for Uganda; Horrell and Krishnan, 2007, for Zimbabwe).

Given the discussion in Section 2, one might expect that FHH are not particularly common in Mali. Out of 4,494 households in the 2006 ELIM sample, 179 and 131 in urban and rural areas, respectively, are headed by women. They account for 11.3 percent of the population of urban heads and 4.5 percent of that of rural heads. A vast majority of these female heads are widows — 75 percent in urban and 64 percent in rural areas versus less than 1 percent of male heads in both areas. The marital status of the rest of the FHH breaks down as follows:

monogamous (11 and 9% in urban and rural areas respectively), polygamous (4 and 22%), divorced or separated (7 and 4%). The first may be left-behind by migrant husbands who may or may not send remittances.¹¹ The second group is often comprised of women whose husbands live with a co-wife and shares his time between wives living in different locations.

A previous study that examines Mali's poverty profile using the 2006 ELIM finds that the poverty rate for FHH is 20 percent lower than for male headed households (MHH) (Backiny-Yetna et al. 2007). The analysis that follows questions these results. In particular, it argues that an investigation of MHH and FHH in Mali using data from the 2006 ELIM reveals that having a female head per se is not decisive in creating poverty but rather that it is the combination of household and individual characteristics, including female headship, widowhood and divorce, that determine living standards.

Table 1 provides descriptive statistics on the key characteristics of MHH and FHH, with the latter also broken down into widowed and non-widowed female heads separately. For some attributes — namely, years of education, number of livestock owned, and whether the outside material of the house is of cement or tile — the differences in means appear to be larger between households headed by widowed women and all other households. For others — including household size and land owned — the key disparities are found to be between MHH and FHH. A distinctive attribute of widowed female heads is their age. They are on average older than other female heads and urban male heads, underscoring the societal reality that younger widows typically remarry into MHH. The very few younger female heads who are widows may well be a selected group who are between marriages or have chosen not to remarry because they can get along on their own, while older ones end up on their own less by choice than necessity.

¹¹ The data confirms that husbands are typically not present when women are identified as household heads. A husband is present in only 2 out of the 310 female headed ELIM 2006 households.

A simple regression of whether a household has a female head against a large number of individual, household and location characteristics confirms that in both rural and urban areas female heads are much more likely than male heads to be widowed or divorced (particularly so in urban areas), to have fewer years of education and to head households that have fewer members as well as significantly fewer adult female members (aged 15 and above) (Table 2).¹² They also appear to be concentrated in certain locations as evidenced by significant location fixed effects (not shown to conserve space). Attributes that are significantly correlated with having a female head also include a younger head in rural Mali and less agricultural land in urban Mali. However, controlling for these other covariates, FHH do not appear to be distinguishable on average from households with male heads on the basis of per capita consumption, other wealth and assets. The significant attributes of FHH are clear candidates as determinants of consumption levels which I next investigate.

It might be conjectured that estimated coefficients on having a female or a widowed female head in consumption regressions will be biased because a household may choose to be female headed for example when husbands live elsewhere and send transfers. This argument is less plausible with respect to widowed heads which account for the vast majority of female heads, but it could still be made. However, my interest here is not to identify the causal effect of having a female or widowed female head but rather to identify differences in conditional means between different types of households. The issue I am addressing is whether FHH and in particular, widowed FFH are poorer than other households, and not whether the fact of being a FHH or becoming a widow caused them to be poorer. From a policy point of view this is the relevant question, for example with respect to targeting on the basis of observed characteristics.

¹² Unfortunately, the ELIM survey did not collect information on ethnicity. I am thus unable to test whether these factors vary across different ethnic groups, although much of the variance due to ethnicity will be captured by the geographic fixed effects since different ethnic groups tend to be concentrated in different areas.

The regressions given in Table 3 focus on the determinants of log household consumption per capita for four different samples. In columns (1) and (2) the samples are restricted to FHH and MHH, respectively. The models prove to be quite different. FHH headed by widowed or divorced women are considerably worse off than those headed by monogamous (the excluded category) or polygamous female heads. The estimated proportionate difference in mean consumption per capita is in the order of 25 percent for households with widowed heads and 30 percent for those with divorced heads. However, the latter is not statistically significant possibly due to the very small sample of divorced female heads. Among male headed households, those headed by polygamous heads are significantly better off but there is no statistically significant disadvantage to being headed by a divorced or widowed head relative to a monogamous one. Household size and demographic composition have similar effects for FHH and MHH. Among endowments and assets, only the years of education have a significant, although modest, return for the consumption of FHH, while MHH additionally have significant positive returns to land and livestock.

The regressions in columns (3) and (4) further explore the determinants of household log per capita consumption for the rural and urban subsamples including covariates for households headed by widowed women versus all other households. Conditional on a large and varied set of household and individual characteristics including geographic fixed effects, we see that rural households with widowed female heads have on average 13 percent lower per capita consumption relative to all other households (headed by men as well as by women of other marital statuses). In urban Mali, the conditional difference in mean consumption per capita between households headed by female widows and all other households is of the order of 8 percent. These are large and significant conditional mean differences.

It is also instructive to examine the significance of female headship without holding other factors constant. As a demographic group, are FHH in Mali unconditionally poorer on average than MHH? Table 4 reports the estimated coefficients on a dummy variable for whether a household is headed by a woman (columns 1 and 3) or a widowed woman (columns 2 and 4) for rural and urban areas separately in a regression of log per capita consumption.¹³ Turning first to rural areas, column (1) shows that the basic regression without any controls other than female headship results in a positive significant estimate of 0.197 ($t=2.83$) suggesting that FHH are approximately 20 percent less poor than MHH — the comparison group for this regression — as suggested by Backiny-Yetna et al. (2007).

However, this result is likely to be spurious since FHH tend also to be smaller (Table 1). The result could be due to a welfare measurement issue, namely that the per capita specification does not allow for economies of scale in consumption (Lanjouw and Ravallion, 1995). Indeed, when I instead use household consumption normalized by the square root of household size to allow for scale economies, the coefficient on FHH reverses sign (-0.093 , $t=-1.53$).¹⁴ In a careful analysis of the relevance of smaller household size to the poverty of female, and in particular widowed female, headed households in India, Drèze and Srinivasan (1997) obtain the same results.

As can be further seen in the next row, a similar result is achieved by returning to the per capita specification and also controlling for log household size. The latter is clearly picking up

¹³ In the regressions reported in Table 4, I drop households headed by rural divorced men and women (11 total) and urban divorced men (6 in all) because of the tiny number of observations in each category and because I am interested in making comparisons across marital statuses. This partly explains the sample size differences between Tables 3 and 4. The other reason is that some controls (assets and the incidence of chronic illness among household members) are missing for some observations. The regressions reported in Table 3 include all the controls while those in Table 4 only progressively add them. Hence sample sizes vary slightly across the regressions in Table 4.

¹⁴ More generally, Lanjouw and Ravallion (1995) suggest a measure of the form Y / N^θ where Y is household consumption, N is household size and θ is the scale parameter with $0 < \theta \leq 1$. The regression coefficient on rural FHH goes to zero at around $\theta = 0.4$.

economies of scale in consumption. Additionally controlling for the commune of residence to allow for location fixed effects, and the month of interview (to capture any seasonality effects), produces a significant negative coefficient of -0.147 ($t=-2.60$) indicating that FHH are indeed poorer — approximately 15 percent poorer — than MHH in rural Mali.¹⁵ Thus, considering the demographic size of the household they head and where they live, FHH have lower living standards, not higher as claimed by Backiny-Yetna et al. (2007).

However, when controls for marital status are also included, both the estimated coefficient and its statistical significance vanish completely. Further controls do not qualitatively alter this result. The result dramatically confirms that it is not female headship per se that is strongly associated with lower living standards but rather that the association is with other characteristics, notably widowhood.

Indeed, on doing the same exercise for rural widowed female heads, far stronger negative effects are found (column 2, Table 4). Note that here the comparison group is not MHH as in column 1 but all rural households not headed by a widowed woman. Controlling only for household size and location, the difference in mean per capita consumption between them and all other households is over 20 percent.

As further controls for marital status, age and age squared, demographic composition, years of education and years squared, household assets and chronic illness are progressively included, the pronounced negative effect of a widowed female head on living standards is somewhat attenuated although it remains highly significant and negative (Table 4). Conditional on all the controls, mean per capita consumption of these households is around 12 percent lower

¹⁵ Interestingly, a regression (not shown) that excludes household size but controls for the commune of residence and the month of interview also eliminates the significant positive effect of female headship (0.011, $t=0.19$), suggesting that within rural areas, FHH live in richer places. There are other possible explanations. For example, it could be that FHH are concentrated in places where interviews took place during the surplus season. The fact that the ELIM was implemented over a 4 month period only would seem to reduce this possibility.

than that of all other rural households. This differs slightly from the 13 percent disparity estimated from the same regression and reported in Table 3 due to the exclusion of divorcee headed households from the comparison group.

The effects of female headship for urban areas, given in columns (3) and (4) of Table 4, are similar to rural areas. Female headship per se is not associated with better or worse household living standards when economies of scale in consumption are ignored. However, combined with widowhood, female headship is associated with significantly lower per capita expenditures. As in rural areas, once scale economies, demographics, and even more so location, are taken into account, FHH — whether headed by widows or not — have significantly lower per capita consumption expenditures. FHH have per capita expenditures that are on average 16 percent lower than male headed households; for households with a widowed female head mean per capita consumption is 19 percent lower than that of all other urban households. Again as in rural areas the significant disadvantage associated with female headship vanishes when marital status is taken into account. For widowed FHH in urban areas, the negative effects are substantially attenuated only when controls are added for education and physical capital, reducing the mean difference to a smaller but still significant 6 percent.¹⁶

In sum, allowing for their smaller household size, I find that FHH are on average poorer than MHH only before controlling for marital status. The analysis suggests that it is FHH headed by widows who are the most impoverished, echoing the findings for Uganda and Zimbabwe (Appleton, 1997; Horrell and Krishnan, 2007). Given the very small sample of rural

¹⁶ Here, the 2% difference with the estimate in Table 3 is due to the omission of urban male divorcee headed households from the comparison group. I also tested effects for divorced FHH of which there are 19 in the ELIM's urban sample. The estimated coefficients are negative and large (-0.20) but vastly attenuated once demographics are included in the regressions. However, they are never statistically significant, possibly due to the limited sample size.

and urban divorced female heads, I am unable to say anything about this group, though there are indications that they may also be relatively disadvantaged.

A considerable drawback to examining the condition of women with this type of data and analysis is that it is limited to households with female heads. A majority of widowed and divorced women get reabsorbed into male headed households either through remarriage or residence. (The ELIM data indicate that 7 percent of women aged 15 and older who are not household heads are current widows.) Thus, an examination of FHH does not allow me to say anything about a large share of ever-widowed or ever-divorced women. To better investigate the welfare of these women, I now turn to the individual data in the DHS.

4. Evidence from individual welfare indicators

We know that widows and divorced women usually remarry in Mali, typically into polygamous households as second, third or fourth wives. As a result of large age gaps between spouses at marriage, far more women than men experience the death of a spouse at some point in their lives; by the same token, significantly more elderly women are widows than men are widowers. The last section found that households headed by widowed women have significantly lower consumption than other households even when controlling for an extensive set of household and individual characteristics, including age. Household level data on consumption or income does not allow us to construct corresponding measures of economic welfare for specific individuals within the household.

Here I examine how, relative to other marital statuses, widowhood (including prior widowhood of currently married women) is correlated with indicators of women's own personal welfare and that of their dependents — whether they are household heads or living in male

headed households. It is worth noting that I focus only on some aspects of well-being, and (for lack of data) neglect what may be important dimensions of welfare associated with widowhood — including bereavement, emotional loss and distress, changes in social and economic status, lifestyle and identity, and frequently, rejection and accusations of having caused the death. Widowhood rites and cleansing rituals are extremely widespread in African cultures, although I have not found references to such customary practices specific to Mali (Sossou 2002).

Demographic and Health Surveys are available for Mali for 1996 and 2006. These surveys have some drawbacks for an analysis of gender and vulnerability — namely, a primary focus on health and reproduction; far greater and more comprehensive coverage of women than of men; the collection of detailed information on women that is restricted to individuals aged 15 to 49; and no income or consumption expenditure data. However, the substantial attraction of the surveys is that they contain information on individuals, including a number of individual level welfare indicators, something that household surveys typically do not. Here, I use the 2006 DHS for Mali.

The 2006 survey identifies current marital status for all women aged 15 to 49, and uniquely, also whether a currently married woman was previously widowed or divorced. Having this detail on marital history information is quite unusual and allows an examination of whether remarriage provides the insurance one would expect.¹⁷ However, there is no way to separately identify widows who are in a leviratic union in the DHS. Furthermore, it is not immediately clear whether such widows are categorized as currently married or as currently widowed in the survey. Given the larger number of remarried widows and the fact that 60 percent of current widows identify themselves as heads of households, while a majority of the rest reside either

¹⁷ Unfortunately, the 1996 DHS identifies only current marital status so that a comparison over time is not feasible.

with their parents or brothers, the following analysis assumes that widows who accepted the levirate are classified as currently married by the DHS.

Table 5 shows the sample of women interviewed in the 2006 DHS by urban-rural sector and marital status. Around 16 percent of this sample have been widowed or divorced at some time, with a rate that is higher in urban than rural areas. Out of 14,583 surveyed women between 15 and 49 years of age, near to 5 percent (655) are previously widowed but currently remarried (430 or 2.95%), or currently widowed (225 or 1.54%). Many more have ever been divorced (12%) and most of these have remarried.¹⁸

The data also reveal that in rural (urban) areas 57 (74) percent of once married women have no co-wives while this is true only for 26 (31) percent and 44 (62) percent of remarriages of prior widows and divorcees, respectively. An examination of the spousal rank of women in polygamous unions confirms that wives who have previously been married are less likely to be ranked as first wife. In urban Mali, 44 percent of once married women are first wives compared to 6 and 11 percent for previously widowed and divorced wives, respectively. In rural areas, the figures are 41 percent for first marriages versus 16 and 23 percent, for those whose first husband passed away or who have divorced.

In sum then, remarriages are much more likely to be into polygamous unions as lower ranked — and hence lower status — wives.

The 2006 DHS also contains information on a number of individual welfare indicators for women as well as for their children. The first of these I examine is women's body mass index

¹⁸ Table 5 presents the population weighted percentages which turn out not to be significantly different from the sample percentages quoted in the text.

(BMI), a measure of health. Low BMI may reflect heightened stress and undernourishment.¹⁹ In addition to the level of BMI, one can look at the share of women whose BMI is greater than the underweight cut-off of 1900.²⁰ Other indicators available from the DHS relate to whether women have dependent children — defined as ones for whom they have primary responsibility — and whether a mother has dependent children living without her in a different location. There are also outcome measures for children that can be linked to mother’s marital status but only for children who reside with their mothers. These include weight for height percentiles, school enrollments and whether daughters are treated differently from sons. Although I cannot link non-cohabiting children with mother’s marital status, I can compare enrollments of children who do and do not live with their mothers.

Two drawbacks of the following analysis should be kept in mind. First, the DHS cannot shed light on the large group of widows and other women who are older than 49, and possibly include the most vulnerable. Nothing can be done to address this data problem.

Second, the DHS sample of ever-widowed or divorced women is selected in the sense that they experience a marriage dissolution shock at a relatively young age. Thus, one potential objection to comparing outcomes for widows and other women is that there may be selection bias whereby widows start off with worse outcomes prior to becoming widows. For example low BMI could predate marriage and widowhood. For example, there may be some reason why women with initially low BMI marry much older men (increasing the probability of widowhood). Thus the “impacts” on well-being actually predate a husband’s demise.

¹⁹ BMI is equal to $\text{weight}/(\text{height}/100)^2$. An individual is widely considered overweight if his or her BMI is larger than 2500; and underweight if it is less than 1850. (Note that these are often expressed as 25 and 18.5 but that the DHS multiplies them by 100 to ensure precision, and I follow their practice.)

²⁰ I use 1900 rather than the more common 1850 cutoff benchmark because there are few data points at higher ages for some groups of women resulting in high volatility in the regression lines there.

The second problem can be studied further. An examination of mean age at first marriage, education, and (perhaps most tellingly) height, reveals no systematic difference between widows and other women. Furthermore, a probit of whether a woman is or has been a widow confirms that only age (including age at first marriage with a significant negative effect in urban areas) and being from the Dogon ethnicity in urban Mali has any explanatory power. The regressions included height which can reasonably be treated as exogenous for this purpose; there was no significant effect of height on the probability of being a widow.²¹

Another clue to the extent of the bias can be obtained if we examine once married women and ask whether a large age gap between spouses worsens their well-being. A regression of the BMI of once married women on the spousal age difference and other controls suggests that a larger age gap is associated with higher, not lower, BMI.

These tests go some way to alleviating concerns about selection although I cannot of course rule out the possibility of some unobserved attribute of widows or of the households they marry into. (Short of running an experiment that randomly creates widows, we can never be sure.)

I now turn to the identified individual welfare indicators to see whether widows or their children are worse off. I start by using the following quadratic model in age (A) to calculate differences in outcomes (Y) for widows ($W=1$) and non-widows ($W=0$):

$$Y_i = \alpha_0 + \alpha_1 A_i + \alpha_2 A_i^2 + (\beta_0 + \beta_1 A_i + \beta_2 A_i^2) W_i + \varepsilon_i \quad (1)$$

where age and widowhood are assumed to be exogenous ($E[\varepsilon_i | A_i, W_i] = 0$). For the purpose of estimating the impacts of widowhood at any given age (A^*), we can re-write (1) as:

$$Y_i = \alpha_0 + \alpha_1 A_i + \alpha_2 A_i^2 + \beta_1 (A_i - A^*) W_i + \beta_2 (A_i^2 - A^{*2}) W_i + \gamma W_i + \varepsilon_i \quad (2)$$

²¹ The controls are age and age squared, age at first marriage, education, whether born in an urban area, height, rural or urban residence and ethnic group.

Here γ gives the impact of widowhood on the outcome variable when evaluated at age A^* , i.e.

$$\gamma = E[Y_i | A_i = A^*, W_i = 1] - E[Y_i | A_i = A^*, W_i = 0] = \beta_0 + \beta_1 A^* + \beta_2 A^{*2} \quad (3)$$

(Other controls can be added to (1) and the impact parameter is then evaluated at specific values of those controls.) The regression is estimated for different ages to get the impact estimates and their standard errors. These are presented in Tables 6 and 7.²²

For most of the women's welfare indicators presented in Table 6, the comparison is between ever-widowed women and all others. Mean differences in BMI and t-statistics are given in the first two columns. Widowhood negatively affects BMI from ages 20 through 40 in rural Mali, although the mean difference is only statistically significant at the 10 percent level for widows around age 30. None of the differences are significant in urban areas. Turning to the results on the share of women with BMI above the underweight cutoff point of 1900, we now see that a significantly higher share of rural widows falls into the underweight zone within the 20 to 45 age range. Again, this does not hold in urban areas.

The data confirm that ever-widowed women are significantly more likely to have children under their primary responsibility than do non-widows for a large part of their adult lives. This is true in both rural and urban areas. For example, at age 35, there is a 0.15 (15 percentage point) mean difference; at ages 40 and 45, the difference is 0.17 in rural and 0.14 in urban areas.

The data also confirm that women who remarry often live separated from at least some of their dependent children. Here it makes more sense to compare currently married, previously widowed, rather than ever widowed women, with other women. From age 20 through their early

²² The mean differences reported in table 6 are estimated with no additional controls to the basic ones noted in equations 1 and 2. I also ran the women's regressions controlling for Dogon ethnicity, whether pregnant (for the BMI regressions), age at first marriage, number of brothers and separately sisters who are alive, years of education and whether they have dependent children (again, only for BMI). These make little difference to the estimates.

forties at least, previously widowed women in rural Mali have a significantly higher probability of having children that do not live with them. At age 30, the mean difference is 0.31 (i.e., widows have a 31 percent point higher probability of having a child living elsewhere). In urban areas, the pattern is more like an inverted U with a lower probability difference below the age of 25, a higher probability thereafter until they reach their early forties and another significant reversal around 50. Finally, the last two columns of Table 6 look at the effects of being ever widowed on the weight for height percentiles of children. Although the mean differences are negative throughout the age distribution in rural areas, none of the differences are statistically significant there. In urban Mali large and significant negative mean differences are indicated for widows 30 and older.

Table 7 takes on the schooling outcomes of the children of ever widowed women versus those of all other marital statuses. These include school enrollments and whether daughters are treated differently from sons. Here, the mean differences are estimated by the age of children. As noted, the data allow an examination of schooling by mother's marital status for cohabiting children only.

We see in Table 7 that there are negative widow effects on enrollments, although these are only statistically significant for children aged 12 in rural areas who have a 7 percentage point lower probability of being in school. None of the differences are statistically significant in urban Mali. Finally, gender schooling gaps favoring boys are significantly higher for the children of widows in both urban and rural Mali and present for all ages. The gap is smaller in rural areas, reflecting the generally lower enrollment rates there. In urban Mali, differences in the gender gaps are remarkably large with girls especially more disadvantaged at young and older ages. At

age 6, the mean difference in the gap is 14 percentage points, declining to 4 at age 12 and rising again to 9 at age 14.

Tables 6 and 7 suggest that widows have a number of differences with women of other marital statuses. Widows are worse off in a number of respects. However, two limitations of the above approach need to be noted: first, it uses a parametric model where the relationship with age takes an explicit quadratic form; this is an arbitrary choice and may not be justified. Second, there may be differences among the non-widow group to consider. (For example, as seen in Section 3, divorced women may also be relatively disadvantaged.)

Non-parametric regressions can be used to explore associations between individual level indicators of welfare such as BMI and women's marital status controlling for age in a more flexible way that does not depend on arbitrary age groupings or require a parametric regression model. A graphic representation can also more easily readily identify and compare multiple marital status groups as long as sample sizes are sufficiently large. Figures 1 and 2 examine BMI in this way.²³ The figures suggest that, controlling for age, widows and previously widowed but currently married women have lower BMI than women who are once married, currently divorced, or divorced and currently married. In rural Mali they have lower BMI than these other groups of women up through their early 40s (Figure 1). Very young widows and divorcees in urban Mali also appear to be disadvantaged in this respect although differentiation by marital status is less pronounced there (Figures 2).

Figures 3 and 4 plot the share of women whose BMI is greater than the underweight cut-off of 19, again using non-parametric regressions and controlling for age. Figure 3 confirms that the incidence of underweight is particularly pronounced among current widows and somewhat higher for previous widows relative to women of other marital statuses up until age 40 or so

²³ These are non-parametric regressions of locally weighted smoothed scatter plots (Lowess).

when divorced women take them over. In urban Mali, current divorcees exhibit the highest rates of underweight (Figure 4).

For all women, the likelihood of having child dependents for whom they hold primary responsibility rises with age as can be seen in Figure 5. In rural areas, this is the case for currently widowed women across the entire age distribution. Under 25 years of age, previously widowed women have about the same probability of having dependents as divorced women from whom they then markedly diverge (Figure 5). In urban areas too, current wives who were previously widowed, current widows and less dramatically so, divorcees, are far more likely to have dependents than women who have only been married once or a second time following a divorce (Figure 6).

In examining differences in the likelihood that women live separated from some of their dependent children it is important to control for mother's age since it could be argued that widows are older than other women and hence more likely to have children that are of an age to have moved away. Figures 7 and 8 show the patterns across the entire age distribution. In rural Mali, a much larger proportion of currently married but once divorced or widowed women have children who live without them from their early 20s through to their forties when there is convergence with women of other marital statuses. Patterns are once again less clear in urban areas, although women that are once married are least likely to have children who do not reside with them throughout most of the age distribution.

Turning now to the welfare of the children of women of different marital statuses, Figures 9 and 10 examine weight for height percentiles of resident dependent children aged 0 to 5 in rural and urban Mali, respectively. Note that these anthropometric measures take account of the child's age, so I only need to control for mother's age. I find a less clear pattern here but still

one suggesting that the young offspring of widows and previously widowed married women are in relatively lower weight for height percentiles. The cohabiting dependents of divorced women in their mid 20s to mid 30s also appear to be very disadvantaged in this respect (Figure 9). In urban Mali, the data jump around a lot more. Here the worst off appear to be the children of divorcees and at older ages (30 and older) those of ever-widowed women (Figure 10).

Figure 11 looks at whether the dependent and cohabiting children of rural women classified by marital status are in school controlling for their own age (5 to 14 years).²⁴ Worryingly, the cohabiting children of rural ever-widowed women and current divorcees are less likely to be in school than the children of women of other marital status particularly at younger and older ages. It is especially striking that these children drop out earlier (Figure 11). In contrast, at any age between 5 and 14, the resident dependents of widows have the highest probability of being in school in urban areas. Those least likely to be in school are the children of divorced women at ages under 8 or so and the dependents of previously widowed but now married women at older ages (Figure 12).

A further issue is whether daughters are treated differently from sons and whether such differential treatment is associated with a mother's marital situation. Figure 13 explores this question by breaking down the school enrollment data given in Figures 11 and 12 by the gender of cohabiting school aged children. The difference between the share of boys versus girls is plotted. Note however, that due to small sample sizes once disaggregation by age and gender is carried out, the children of current widows and current divorced women are not included in Figure 13. Likewise, there may be some small-sample problems with the married, previously widowed group in urban areas to keep in mind. In both urban and rural Mali, boys are overall

²⁴ The DHS only allows a linkage between a mother's ID and her children for those up to age 14, which is why the school enrollment outcome looks at children between 5 and 14.

more likely to be in school than girls conditional on a given marital status. However, the gap appears to be much less pronounced and increases only weakly with age among the children of once married women. The daughters of previously widowed or divorced women hold an advantage at very young ages in rural areas, but once they reach seven and a half or so, the gap reverses, rising quite steeply with age, particularly for the children of previously widowed women. The latter's pro-son gap overtakes that for the offspring of once married women from around age 10 for the children of prior widows and around age 12 for those of prior divorcees. In urban areas, the gender gap favors boys at all ages and is generally significantly larger for the children of previously widowed and divorced women. Reinforcing the regression results on mean differences, the evidence is thus strongly suggestive of negative human capital investment effects being worse for cohabiting daughters than for cohabiting sons in the event of their mother experiencing a marital status shock.

As we saw earlier, some of the children whose mothers remarry after widowhood or divorce, live separated from their mothers. Figure 14 compares the enrollments of children who do and do not live with their mothers for boys and girls in urban and rural areas.²⁵ The large urban/rural, and within each sector, the smaller gender gaps are immediately apparent. What is also striking is the detrimental effect that not residing with one's mother has on children's school enrollments. This is particularly pronounced for urban girls. From about age 9, there is a steady and precipitous drop in school attendance for urban girls whose mothers do not reside in the same place relative to those whose mothers do.

The DHS also asks about access to health care and what problems women face in seeking care for themselves when they are ill. One could argue that this information is free of selection

²⁵ The sample of children without a mother in the home includes children whose mother may not be alive. However, limiting the sample to those children whose mother is alive but not residing with them gives a very similar picture.

concerns. Table 8 shows the percentages of women who reported getting permission to seek treatment and a lack of money as serious obstacles. In both urban and rural areas ever widowed women stand out as being disadvantaged in these respects. A larger proportion of women who are currently married but previously widowed than other women state that obtaining permission is a problem, suggesting a lower degree of autonomy. Ever widowed women — both current and previously widowed — are also considerably more likely to report that they lack the resources to seek treatment. This is true of a whopping 80 percent of widows in rural areas. It is also the case for 70 percent of divorced women in rural areas.

Based on the few individual welfare indicators that are available, there are therefore some strong indications that widows and women who have been widowed in the past are worse off and less able to provide for their children, as well as more vulnerable to downside risk than many other women. The patterns for currently divorced women tend to be less consistent but they too often appear highly disadvantaged. This is particularly the case in rural Mali.

5. Conclusions

The plight of widows in many African countries has been largely neglected in the work of economists and in public policy action. Although it has been a recurrent topic in the sociological and anthropological literatures, the economics literature has often focused on female headed households including those headed by widows. Widows have also figured in discussions of old-age poverty and social pensions and more recently, in the context of gendered asset inheritance and the consequences of the HIV/AIDS epidemic. But, the situation of ever-widowed women of often young ages who have remarried and so are no longer labeled

“widows,” or have been in some other way absorbed into male headed households along with their dependent children has to my knowledge received scant attention.

This paper has used available data and simple descriptive statistics to examine the individual welfare of women who have experienced the shock of widowhood or divorce in Mali. The welfare of their dependent children has also been examined.

A review of the situation of women in Mali suggests that they may be generally more vulnerable and less able to mitigate and cope with downside risk than men. And women may be exceptionally vulnerable to the loss of a husband.

An analysis of available household consumption data on female headed households indicates that, even controlling for their age and other individual and household characteristics, they have lower living standards than male headed households in both rural and urban areas. Female heads who are also widows are significantly poorer.

Finally, an examination of individual welfare indicators from the 2006 DHS for Mali confirms that widows who are not necessarily household heads experience lower levels of these indicators. It also reveals that relative to other women, the vulnerability and lower welfare of women previously widowed or divorced persists through remarriage. Furthermore, these detrimental effects are passed on to children — and possibly more so to daughters — suggesting an intergenerational transmission of poverty stemming from widowhood and (less so) divorces.

Yet a review of social safety nets implemented by government and donors reveals that there is little systematic attempt to reach widows or their dependent children. Although it may be tricky to target widows and it should be kept in mind that the same conditions that create inequality within households also constrain the ability to target women per se with interventions, more thought, resources and effort need to go into helping these very vulnerable groups.

There are a number of ways to reduce the vulnerability of widows that bear some thought and could be experimented with. On one front, legal reforms and measures such as inheritance laws that protect the security of widows and their children need to be considered. Widow pensions are a policy that a number of developing countries have adopted, including India (Dutta et al., 2010). The receipt of such transfers conditional on the loss of a husband irrespective of age, could well improve the status as well as the well-being of widows in Malian society. The amounts might be predicated on the number of dependents.

Finally, the results from this study demonstrate once again the importance of examining the allocation of resources and the treatment of individual members within the household. They also hold an important implication for data collection as well as for the study of marriage and socio-economic status. Surveys typically record current marital status but rarely collect information on marital history. The findings here underline the value of collecting the details on marital history and taking it into account in countries such as Mali where marital status can be a critical determinant of living standards.

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Table 1: Summary statistics for heads of households by gender

	Male		Female					
	Rural	Urban	All		Widowed		Not widowed	
			Rural	Urban	Rural	Urban	Rural	Urban
Age of head	52.94 [14.18]	49.41 [13.14]	48.12 [14.48]	50.28 [12.45]	50.75 [14.36]	52.86 [11.39]	43.39 [13.62]	42.57 [12.41]
Head married monogamous	0.52 [0.50]	0.71 [0.45]	0.08 [0.28]	0.11 [0.32]	- -	- -	0.24 [0.43]	0.46 [0.50]
Head married polygamous	0.46 [0.50]	0.27 [0.44]	0.22 [0.41]	0.04 [0.20]	- -	- -	0.61 [0.49]	0.16 [0.37]
Head divorced	0.001 [0.03]	0.003 [0.06]	0.04 [0.19]	0.07 [0.26]	- -	- -	0.10 [0.30]	0.28 [0.45]
Head widowed	0.01 [0.11]	0.01 [0.09]	0.64 [0.48]	0.75 [0.43]	1.00 [0]	1.00 [0]	- -	- -
Head chron. ill last year	0.57 [0.49]	0.51 [0.50]	0.47 [0.50]	0.51 [0.50]	0.48 [0.50]	0.58 [0.50]	0.46 [0.50]	0.32 [0.47]
Others chron. ill	0.06 [0.11]	0.06 [0.11]	0.06 [0.13]	0.07 [0.12]	0.06 [0.13]	0.08 [0.13]	0.05 [0.12]	0.03 [0.07]
Head's schooling yrs	0.78 [2.30]	3.43 [4.34]	0.32 [1.61]	1.99 [3.52]	0.22 [1.24]	1.56 [3.13]	0.50 [2.12]	3.26 [4.28]
Household size	13.22 [8.11]	10.05 [5.85]	7.92 [4.59]	8.76 [5.11]	7.68 [4.53]	9.21 [5.37]	8.34 [4.72]	7.40 [3.98]
Share women 56+	0.03 [0.06]	0.02 [0.06]	0.01 [0.06]	0.01 [0.05]	0.01 [0.07]	0.01 [0.05]	0.01 [0.04]	0.01 [0.03]
Share men 56+	0.004 [0.02]	0.004 [0.03]	0.002 [0.01]	0.002 [0.02]	0.002 [0.02]	0.001 [0.01]	0.003 [0.01]	0.004 [0.04]
Share women 15-55	0.27 [0.12]	0.29 [0.15]	0.18 [0.16]	0.27 [0.18]	0.19 [0.18]	0.28 [0.17]	0.14 [0.10]	0.23 [0.22]
Share men 15-55	0.14 [0.13]	0.16 [0.17]	0.21 [0.21]	0.26 [0.23]	0.24 [0.22]	0.28 [0.23]	0.16 [0.18]	0.21 [0.20]
Share girls 0-6	0.14 [0.12]	0.12 [0.13]	0.13 [0.19]	0.10 [0.15]	0.12 [0.19]	0.09 [0.12]	0.15 [0.18]	0.13 [0.20]
Share boys 0-6	0.15 [0.13]	0.14 [0.16]	0.15 [0.18]	0.10 [0.15]	0.14 [0.15]	0.07 [0.10]	0.19 [0.21]	0.19 [0.23]
Non-ag land '00 m2	6.57 [38.38]	1.76 [5.78]	1.80 [9.74]	0.93 [2.05]	1.82 [11.97]	0.95 [1.92]	1.77 [3.03]	0.87 [2.41]
Ag land (hectares)	7.55 [12.93]	1.36 [3.12]	4.11 [6.32]	0.63 [1.92]	4.62 [7.39]	0.70 [2.03]	3.19 [3.61]	0.44 [1.55]
No. cows/betail	9.55 [16.91]	2.36 [8.13]	5.94 [15.94]	0.72 [2.56]	6.30 [17.55]	0.62 [2.26]	5.31 [12.67]	1.00 [3.32]
No. other livestock	10.53 [18.24]	4.08 [11.79]	7.12 [14.33]	1.43 [4.37]	5.19 [12.89]	1.33 [4.61]	10.59 [16.2]	1.73 [3.600]
House exterior cement/ tile	0.06 [0.23]	0.59 [0.49]	0.05 [0.22]	0.62 [0.49]	0.03 [0.17]	0.63 [0.49]	0.09 [0.29]	0.59 [0.50]
Log consumption per cap	11.78 [0.59]	12.32 [0.66]	11.91 [0.58]	12.36 [0.62]	11.88 [0.48]	12.31 [0.6]	11.96 [0.73]	12.51 [0.66]
Log consumption per equiv.	12.99 [0.55]	13.40 [0.63]	12.85 [0.53]	13.37 [0.58]	12.81 [0.45]	13.35 [0.57]	12.94 [0.65]	13.43 [0.60]
Observations	2,779	1,405	131	179	89	115	42	64

Note: Standard deviations in parentheses. All statistics above are population weighted. Log consumption per equivalent person is defined as the log of household consumption normalized by the square root of household size to allow for scale economies. Source: 2006 ELIM.

Table 2: Correlates of female household headship

Variables	Household is female headed	
	rural	urban
Age of household head	-0.001** [-2.01]	-0.0005 [-0.84]
Head married monogamous	-0.077 [-1.21]	-0.176 [-1.57]
Head married polygamous	-0.036 [-0.57]	-0.142 [-1.25]
Head is divorced/separated	0.359* [1.90]	0.531*** [3.21]
Head is widowed	0.570*** [7.82]	0.698*** [5.86]
Head chronically ill in past year	-0.003 [-0.39]	-0.024* [-1.97]
Share of other members > 15 yrs that were chronically ill	0.03 [0.98]	-0.019 [-0.43]
Years of schooling of head	-0.003* [-1.69]	-0.002** [-2.61]
Log household size	-0.045*** [-4.13]	-0.039* [-1.87]
Share of members women 56+	-0.133** [-2.49]	-0.193* [-1.92]
Share of members men 56+	-0.04 [-0.22]	-0.124 [-0.58]
Share of members women 15-55	-0.166*** [-4.02]	-0.146*** [-2.87]
Share of members men 15-55	0.052 [1.57]	0.032 [0.72]
Share of members girls 0-6	-0.007 [-0.22]	0.043 [0.76]
Share of members boys 0-6	0.011 [0.34]	0.012 [0.31]
Non-agr. landownings (100s m ²)	-0.0001 [-1.31]	-0.001 [-1.31]
Agr. landownings (hectares)	0.0001 [0.54]	-0.002** [-2.18]
No. cows/betail owned	0.00004 [0.21]	0.0001 [0.28]
No. other livestock owned	-0.0001 [-0.35]	-0.0001 [-0.54]
House exterior made of cement or tile	0.015 [1.12]	0.002 [0.16]
Log consumption per capita	-0.007 [-0.78]	0.002 [0.20]
Constant	0.273** [2.08]	0.337* [1.71]
Observations	2,782	1,549
R-squared	0.57	0.68

Note: The dependent variable is a dummy for whether a household is female headed. A linear probability model is used. Robust t-statistics in brackets, clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1. The regressions also control for location fixed effects and interview months.

Source: 2006 ELIM.

Table 3: Regressions for household consumption per capita (log)

VARIABLES	(1) FHH	(2) MHH	(3) All rural	(4) All urban
Widowed female head	--	--	-0.128** [-2.23]	-0.081** [-2.52]
Age of household head	0.005 [1.24]	-0.009** [-2.52]	-0.007* [-1.80]	0.001 [1.30]
Age squared	--	0.0001** [2.16]	0.00005 [1.35]	--
Head married polygamous	-0.091 [-0.43]	0.070*** [3.00]	--	--
Head is widowed	-0.246** [-2.29]	-0.045 [-0.71]	--	--
Head is divorced/separated	-0.306 [-1.48]	-0.001 [-0.01]	--	--
Head chronically ill in past year	0.251* [1.92]	0.079*** [3.69]	0.084*** [3.53]	0.095** [2.56]
Share of others > 15 yrs ill	-0.611 [-1.39]	0.112 [1.51]	0.096 [1.12]	0.083 [0.73]
Log household size	-0.500*** [-6.95]	-0.410*** [-22.02]	-0.371*** [-16.99]	-0.430*** [-21.15]
Share of members women 56+	0.396 [0.55]	-0.105 [-1.08]	-0.083 [-0.67]	-0.052 [-0.41]
Share of members men 56+	0.576 [1.28]	0.019 [0.05]	-0.901** [-2.03]	0.660** [2.14]
Share of members women 15-55	0.464** [2.09]	0.157*** [2.79]	0.177** [2.53]	0.314*** [4.60]
Share of members men 15-55	0.237 [1.07]	0.158** [2.59]	0.074 [1.04]	0.323*** [4.07]
Share of members girls 0-6	-0.038 [-0.15]	-0.059 [-0.88]	-0.055 [-0.68]	-0.032 [-0.27]
Share of members boys 0-6	0.054 [0.19]	-0.127** [-2.01]	-0.123* [-1.67]	-0.038 [-0.36]
Years of schooling of head	0.048*** [2.68]	-0.043*** [-5.28]	-0.041*** [-2.93]	-0.037*** [-3.65]
Years schooling squared	--	0.008*** [10.15]	0.008*** [4.77]	0.007*** [8.13]
Non-agr. landownings (100s m ²)	0.017 [0.73]	0.001*** [5.30]	0.001*** [5.41]	0.009*** [2.66]
Agr. landownings (hectares)	-0.0001 [-0.00]	0.002 [1.20]	0.002 [1.23]	-0.003 [-0.89]
No. cows/betail owned	0.007 [0.47]	0.005*** [5.96]	0.005*** [5.92]	0.006** [2.12]
No. other livestock owned	0.003 [0.85]	0.001** [2.54]	0.002*** [2.73]	0.0002 [0.18]
House exterior made of cement/tile	0.209 [1.64]	0.354*** [10.11]	0.264*** [5.08]	0.388*** [9.95]
Rural	-0.209 [-1.08]	-0.108* [-1.91]	--	--
Constant	11.988*** [15.25]	13.343*** [98.38]	12.437*** [31.79]	13.117*** [92.85]
Observations	283	4,048	2,782	1,549
R-squared	0.727	0.651	0.587	0.553

Note: Dependent variable is log household consumption per capita. Robust t-statistics in brackets, clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1. The regressions also control for location fixed effects and interview months.

Source: 2006 ELIM.

Table 4: Estimated effects of female and female widow headship on log household consumption per capita with various combinations of controls

Dependent variable	Other controls in regression	(1)	(2)	(3)	(4)
		Rural Female head	Rural Female widow head	Urban Female head	Urban Female widow head
Log consumption per capita	No other controls	0.197*** (2.83)	0.098 (1.62)	-0.017 (-0.33)	-0.101* (-1.89)
Log consumption per equivalent single person to allow for economies of scale	No other controls	-0.093 (-1.53)	-0.207*** (-3.57)	-0.134*** (-2.90)	-0.141** (-2.45)
Log consumption per capita	Log household size	-0.060 (-1.00)	-0.175*** (-3.01)	-0.118** (-2.52)	-0.135** (-2.41)
Log consumption per capita	Above control + geographic & interview month dummies	-0.147*** (-2.60)	-0.215*** (-3.50)	-0.160*** (-3.65)	-0.188*** (-4.19)
Log consumption per capita	above controls + marital status	-0.066 (-0.89)	-0.189*** (-3.43)	-0.078 (-0.97)	-0.178*** (-3.63)
Log consumption per capita	above controls + age & age squared	-0.074 (-0.99)	-0.171*** (-3.06)	-0.065 (-0.80)	-0.201*** (-4.11)
Log consumption per capita	Above controls + household composition	-0.057 (-0.76)	-0.156*** (-2.72)	-0.033 (-0.46)	-0.199*** (-3.99)
Log consumption per capita	Above controls + years of education & years squared	-0.058 (-0.81)	-0.139** (-2.44)	0.017 (0.24)	-0.067 (-1.52)
Log consumption per capita	Above controls + assets	-0.063 (-0.88)	-0.129** (-2.28)	0.005 (0.08)	-0.056 (-1.50)
Log consumption per capita	Above controls + chronic illness of head & of other members	-0.046 (-0.63)	-0.121** (-2.24)	0.012 (0.18)	-0.064** (-2.09)
Observations		2,797 — 2772		1,578 — 1544	

Note: Log consumption per equivalent single person is defined as the log of household consumption normalized by the square root of household size. The rural sample omits 11 households with divorced heads (6 female and 5 male); the urban sample omits the 6 households with divorced male heads. In addition the number of observations varies across the different regressions as noted due to some missing observations for some of the added controls, notably assets and chronic illness of other household members. Robust t-statistics in brackets, clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

Source: 2006 ELIM.

Table 5: 2006 DHS sample of women 15 to 49 by marital status

Marital status	Urban	Rural	Total
Single	865 16.97%	880 9.20%	1,745 11.85%
Married once	3,324 61.59%	7,173 75.49%	10,497 70.74%
Married, previously widowed	110 2.41%	320 3.67%	430 3.24%
Married, previously divorced	567 13.35%	830 9.46%	1,397 10.79%
Currently widowed	98 1.84%	127 1.27%	225 1.47%
Currently divorced	179 3.83%	110 0.91%	289 1.91%
Total	5,143 100%	9,440 100%	14,583 100%

Note: Sample size and population percentages. Percentages are population weighted.

Source: 2006 Mali DHS.

Table 6: Difference in means between widows and non-widows at different ages

Woman's Age	BMI(x100)		Share of women with BMI above 1900		Share of women with dependent children		Share of women with children living elsewhere		Weight for height percentiles of children 0-5.	
	Ever widowed		Ever widowed		Ever widowed		Remarried widow		Ever widowed	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
15	61.83 (0.74)	-41.74 (-0.36)	-0.01 (-0.09)	0.26 (3.53)	0.07 (0.51)	0.18 (0.85)	0.10 (0.67)	-0.60 (-3.40)	-1.22 (-0.32)	2.96 (0.44)
20	-8.50 (-0.18)	-15.51 (-0.25)	-0.06 (-0.82)	0.13 (2.90)	0.10 (1.23)	0.17 (1.35)	0.23 (2.41)	-0.23 (-2.30)	-6.57 (-1.18)	6.18 (0.57)
25	-50.41 (-1.74)	4.09 (0.08)	-0.09 (-2.23)	0.04 (1.29)	0.12 (2.53)	0.16 (2.16)	0.29 (5.68)	0.04 (0.61)	-3.24 (-1.15)	0.42 (0.07)
30	-63.92 (-2.33)	17.06 (0.30)	-0.10 (-3.11)	-0.01 (-0.33)	0.14 (3.50)	0.15 (2.60)	0.31 (7.80)	0.20 (3.11)	-1.58 (-0.72)	-4.18 (-1.12)
35	-49.01 (-1.80)	23.38 (0.40)	-0.08 (-2.80)	-0.03 (-0.88)	0.15 (4.09)	0.15 (2.61)	0.26 (6.95)	0.25 (4.13)	-1.60 (0.67)	-7.62 (-2.11)
40	-5.69 (-0.23)	23.08 (0.46)	-0.05 (-1.93)	-0.04 (-0.18)	0.17 (5.27)	0.14 (2.87)	0.17 (5.09)	0.19 (4.02)	-3.30 (-1.35)	-9.90 (-3.21)
45	66.04 (1.91)	16.13 (0.30)	0.008 (0.30)	0.05 (2.18)	0.17 (4.68)	0.14 (2.50)	0.01 (0.42)	0.03 (0.48)	-6.68 (-1.91)	-11.00 (-2.75)
50	200.14 (2.53)	-7.34 (-0.06)	0.11 (1.54)	0.20 (3.73)	0.17 (1.70)	0.14 (1.09)	-0.26 (-2.81)	-0.39 (-2.27)	-13.91 (-1.74)	-8.75 (-0.76)
Obs.	9052	4792	9052	4792	9026	4774	9052	4792	7309	3098

Note: The table gives the mean for widows less than for non-widows. Ever-widowed includes currently widowed as well as previously widowed, currently married women. t-stats in parentheses. DHS multiplies BMI by 100.

Table 7: Difference in means for schooling outcomes between widow and non-widow's children

Child's age	School enrollments of co-habiting dependent children		School enrollment gender gaps for co-habiting dependent children (boy-girl)	
	Ever widowed		Ever widowed	
	Rural	Urban	Rural	Urban
6	0.01 (0.44)	-0.02 (-0.41)	0.03 (7.47)	0.14 (7.27)
8	-0.01 (-0.45)	-0.06 (-0.74)	0.02 (3.61)	0.11 (6.76)
10	-0.04 (-1.25)	-0.09 (-1.06)	0.01 (2.47)	0.08 (4.35)
12	-0.07 (-2.13)	-0.13 (-1.56)	0.02 (4.82)	0.04 (2.05)
14	-0.07 (-0.64)	-0.16 (-0.61)	0.03 (6.45)	0.09 (4.61)
Obs.	11267	4228	11286	4222

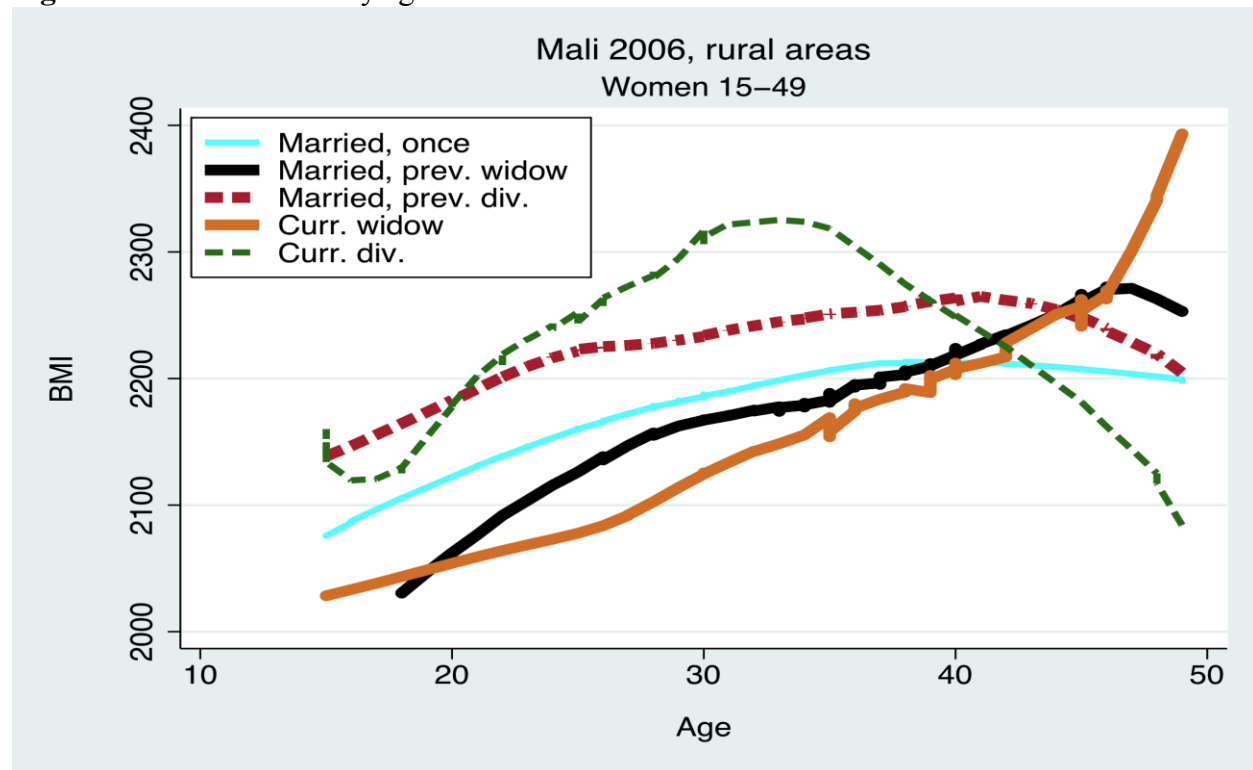
Note: The table gives the mean for widows less that for non-widows. Ever-widowed includes currently widowed as well as previously widowed, currently married women. t-stats in parentheses.

Table 8: Percent of women who reported obtaining permission and lack of money as impediments to seeking health care for themselves when sick, by marital status

	Permission		Money	
	Rural	Urban	Rural	Urban
Married once	20.2 (40.2)	13.1 (33.8)	59.0 (49.2)	39.1 (48.8)
Married, previously widowed	25.2 (43.5)	29.4 (45.8)	65.5 (47.6)	60.7 (49.1)
Married, previously divorced	17.4 (38.0)	10.5 (30.6)	54.4 (49.8)	35.5 (47.9)
Widowed	18.4 (38.9)	10.1 (30.3)	80.5 (39.8)	62.7 (48.6)
Divorced	18.9 (39.4)	10.1 (30.2)	70.3 (45.9)	43.6 (49.7)

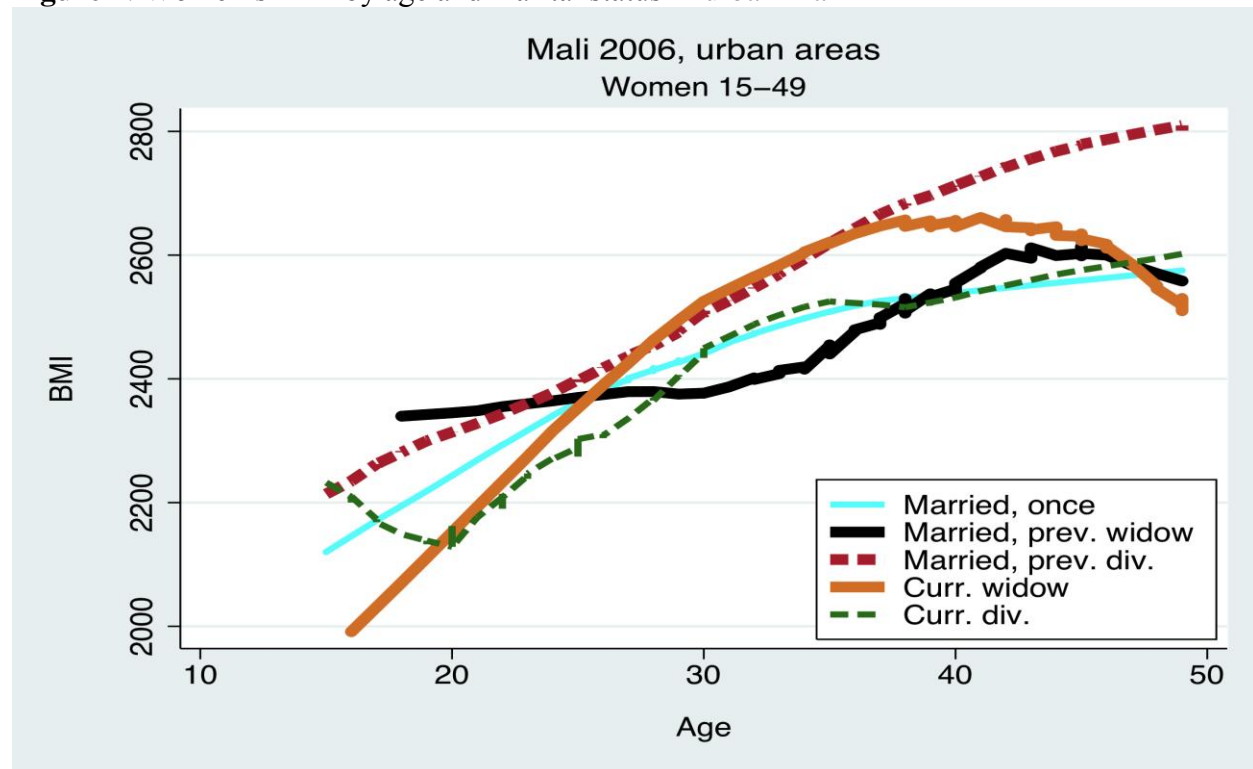
Note: Figures are population weighted. Standard deviations are given in parentheses.
Source: 2006 Mali DHS.

Figure 1: Women's BMI by age and marital status in rural Mali



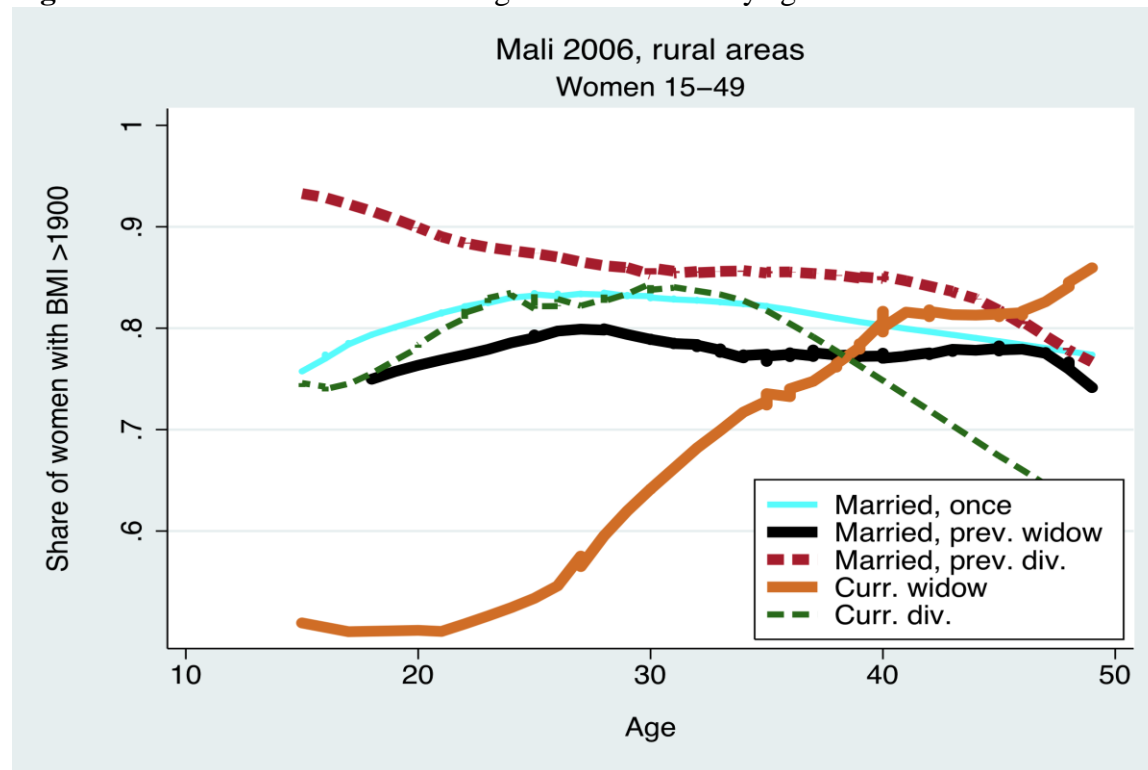
Source: 2006 Mali DHS

Figure 2: Women's BMI by age and marital status in urban Mali



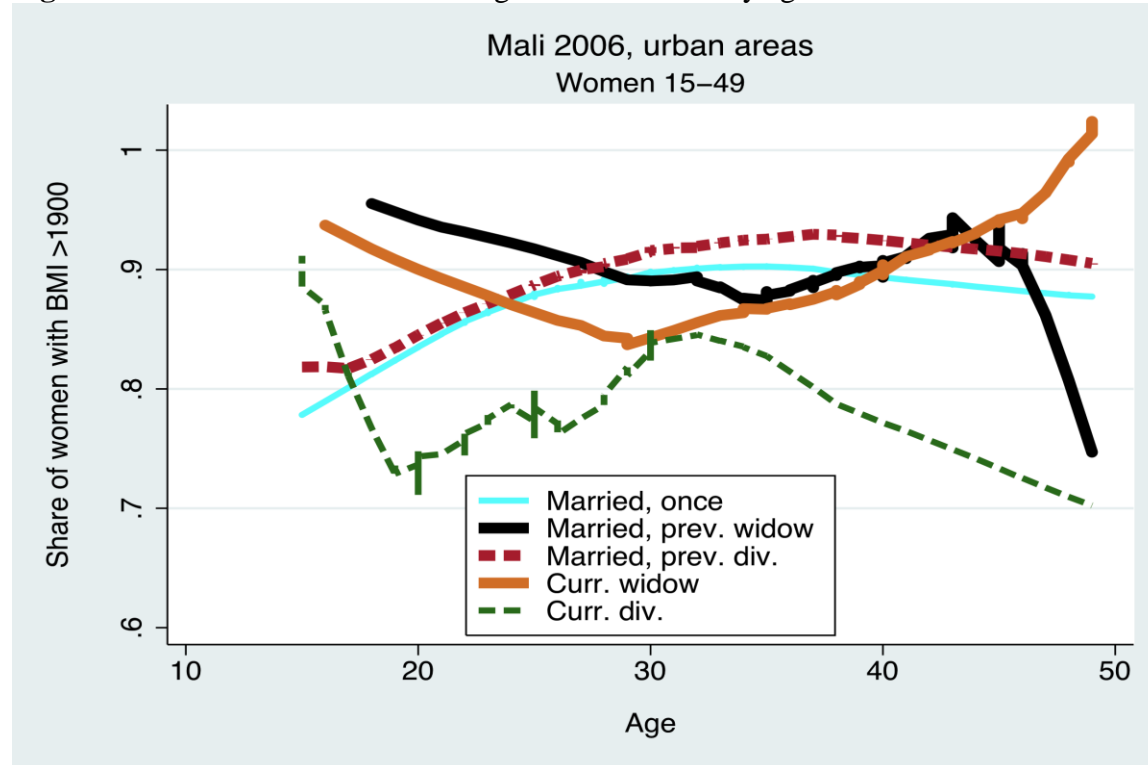
Source: 2006 Mali DHS

Figure 3: Share of women with BMI greater than 1900 by age and marital status in rural Mali



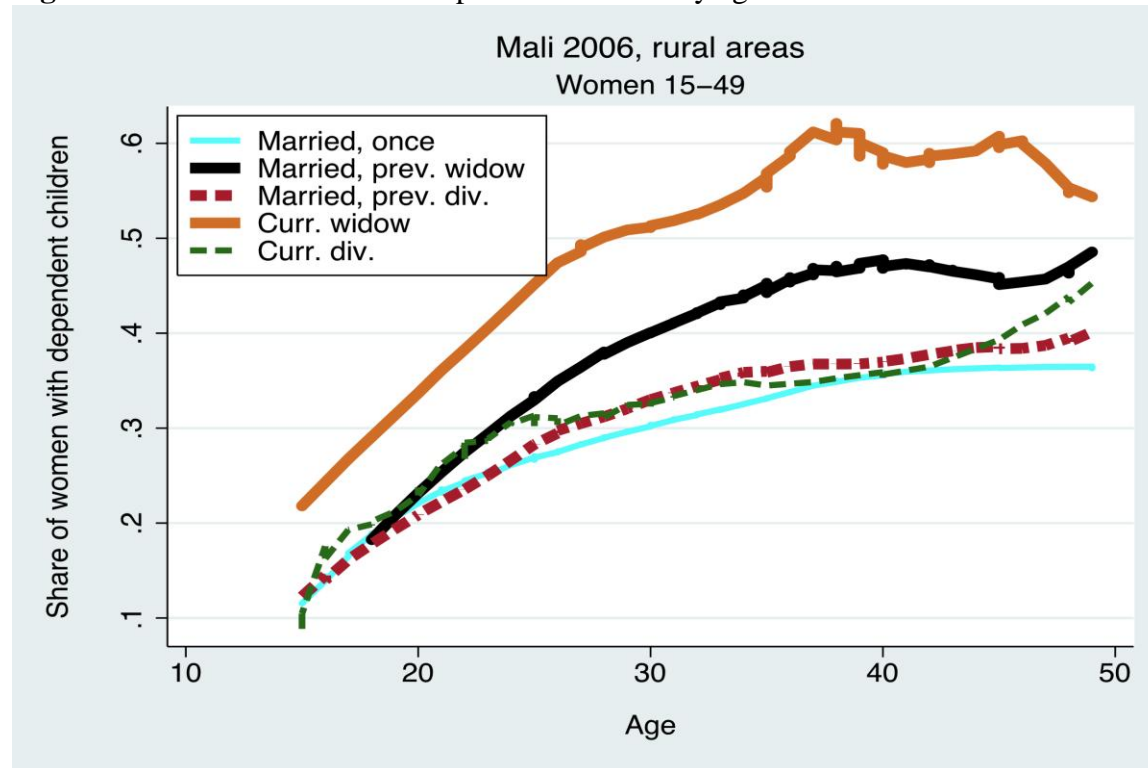
Source: 2006 Mali DHS

Figure 4: Share of women with BMI greater than 1900 by age and marital status in urban Mali



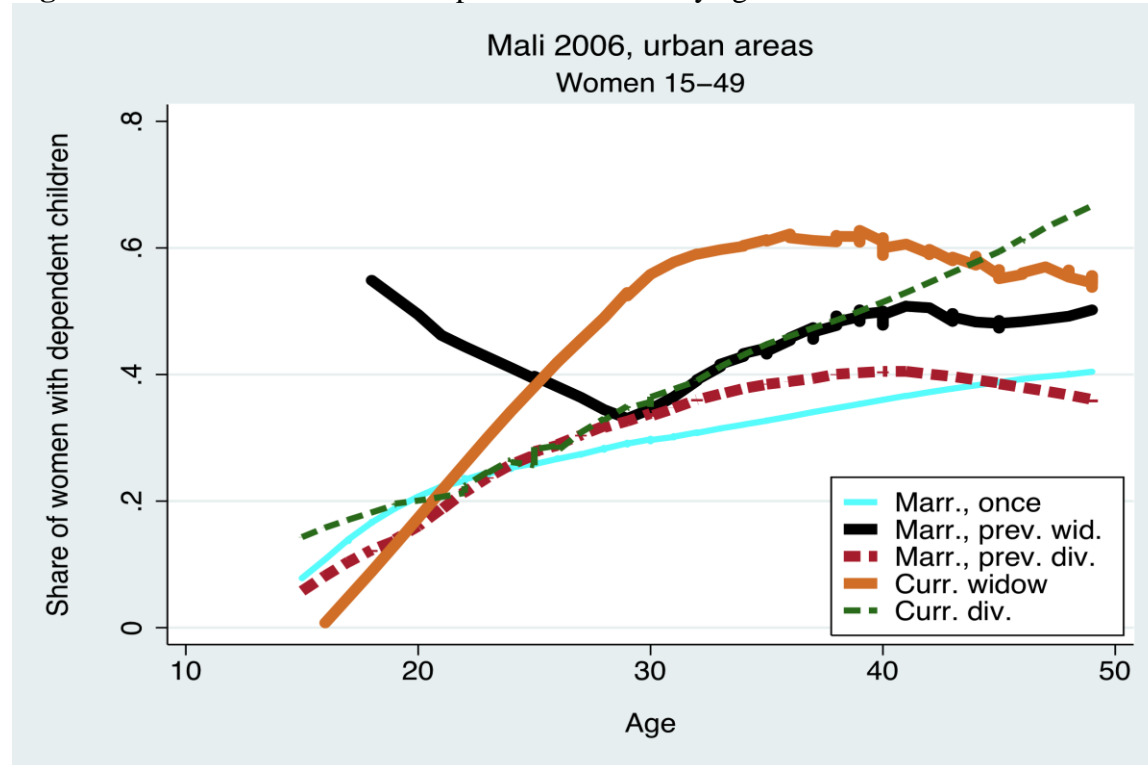
Source: 2006 Mali DHS

Figure 5: Share of women with dependent children by age and marital status in rural Mali



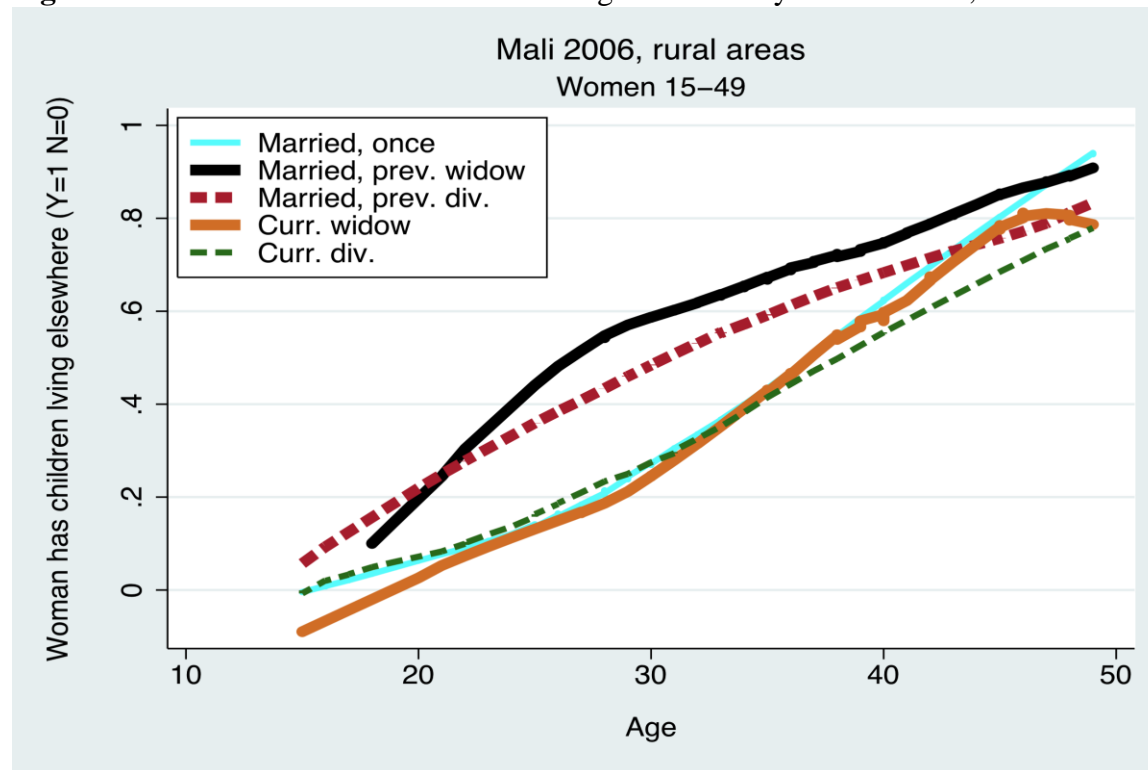
Source: 2006 Mali DHS

Figure 6: Share of women with dependent children by age and marital status in urban Mali



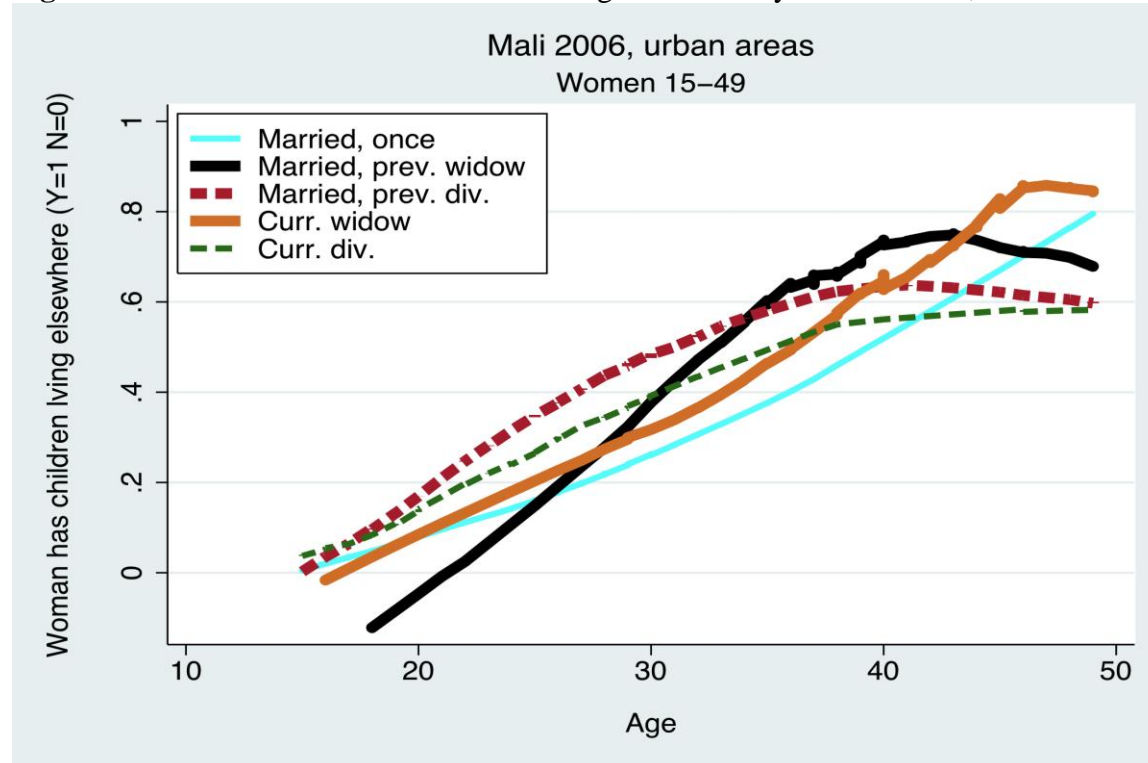
Source: 2006 Mali DHS

Figure 7: Share of women with children living elsewhere by marital status, rural Mali 2006



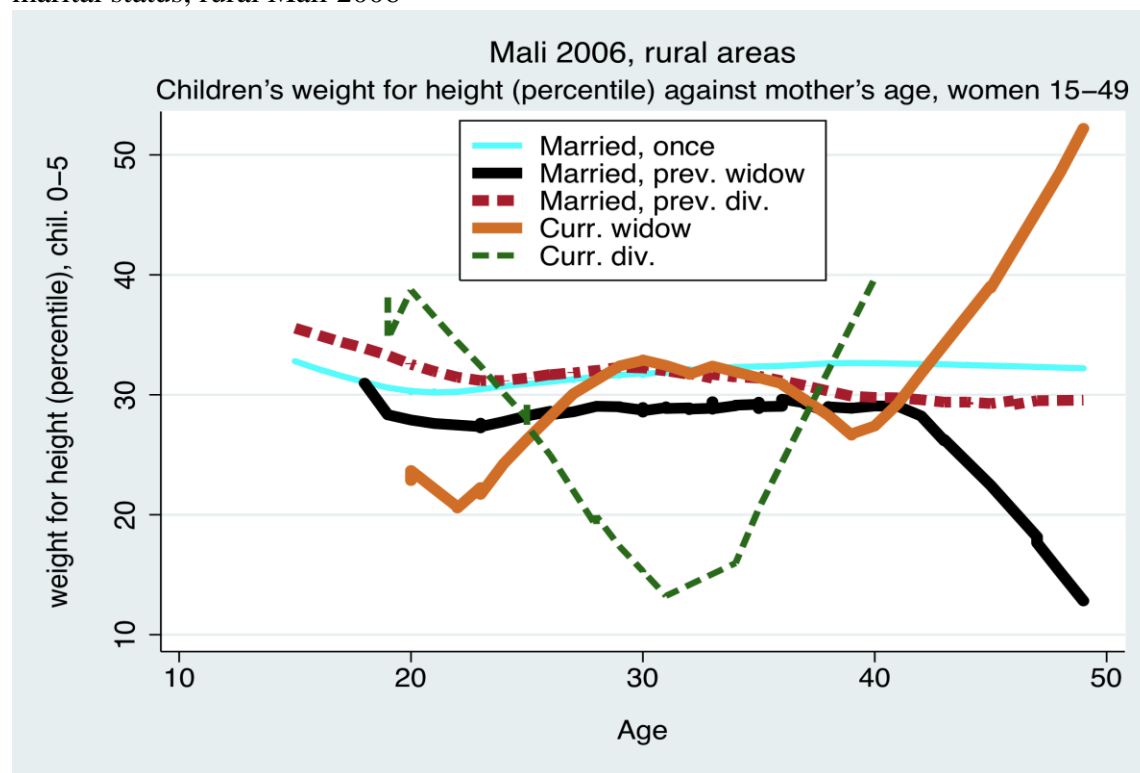
Source: 2006 Mali DHS

Figure 8: Share of women with children living elsewhere by marital status, urban Mali 2006



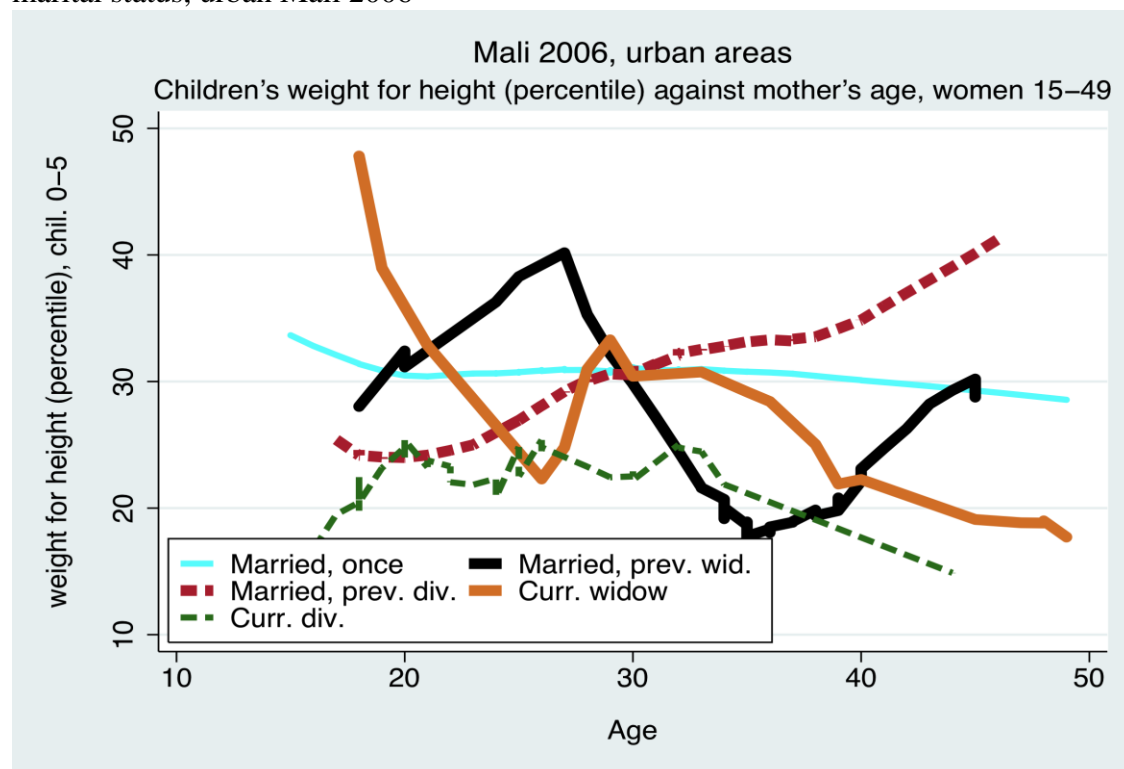
Source: 2006 Mali DHS

Figure 9: Weight for height percentiles of cohabiting dependent children aged 0-5 by mother's marital status, rural Mali 2006



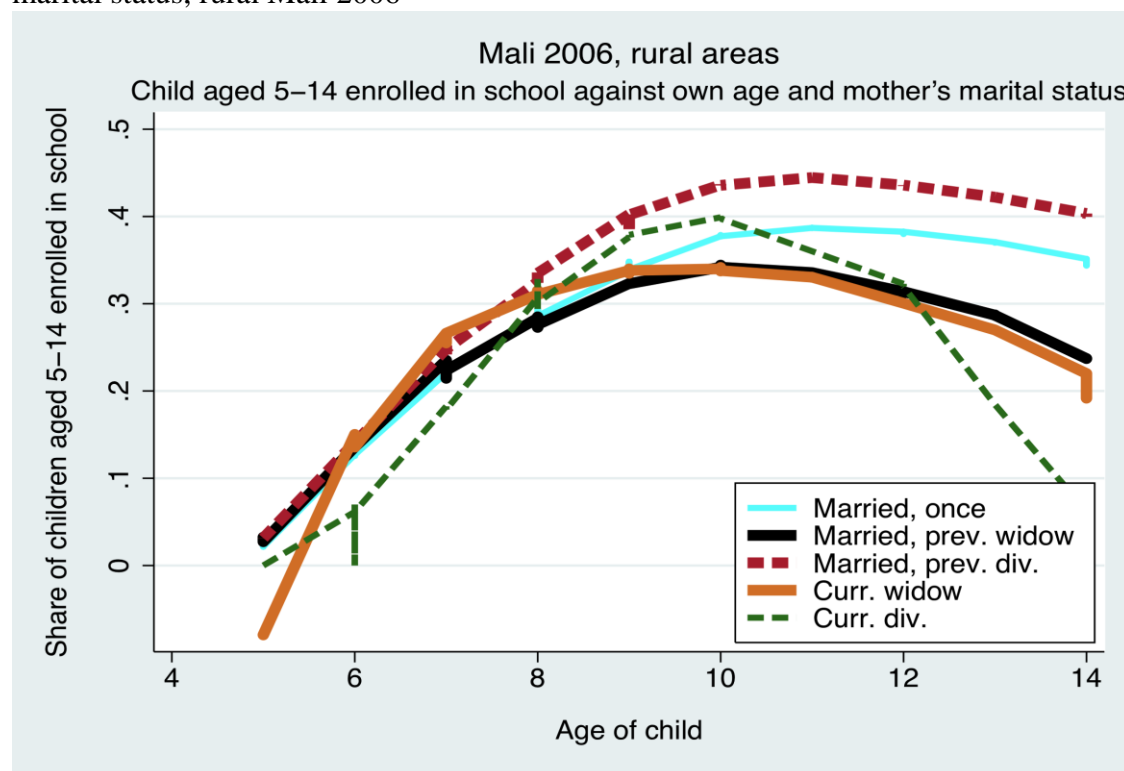
Source: 2006 Mali DHS

Figure 10: Weight for height percentiles of cohabiting dependent children aged 0-5 by mother's marital status, urban Mali 2006



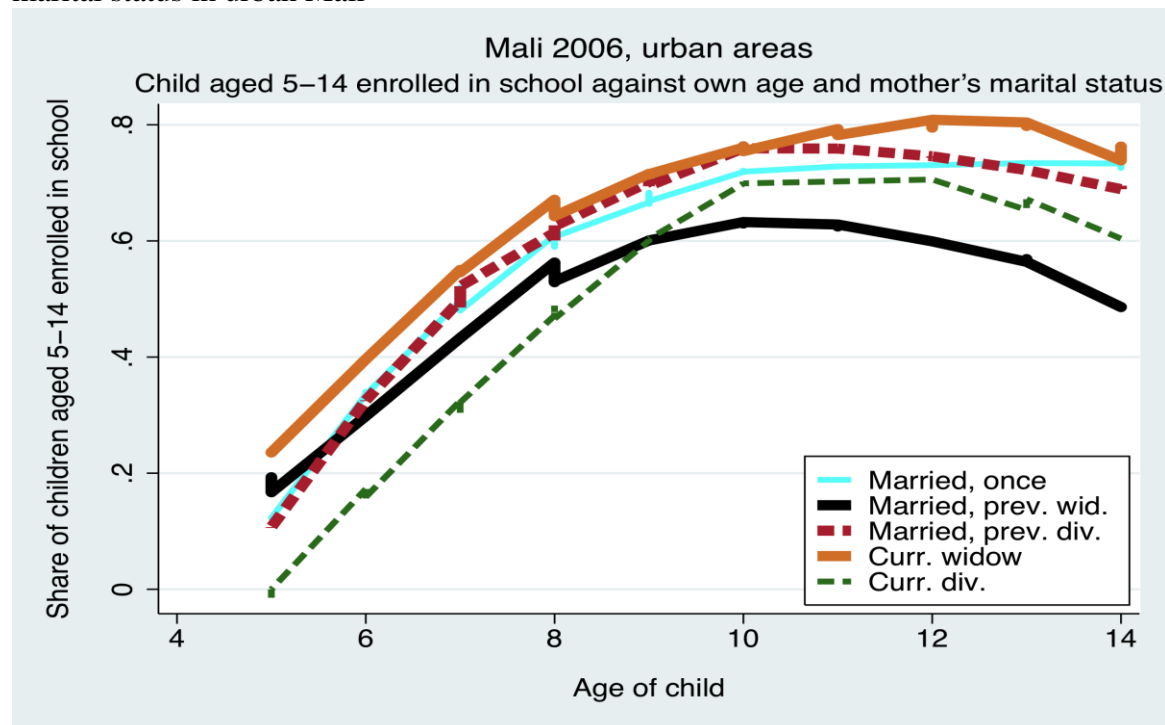
Source: 2006 Mali DHS

Figure 11: School enrollments of cohabiting dependent children aged 5-14 by age and mother's marital status, rural Mali 2006



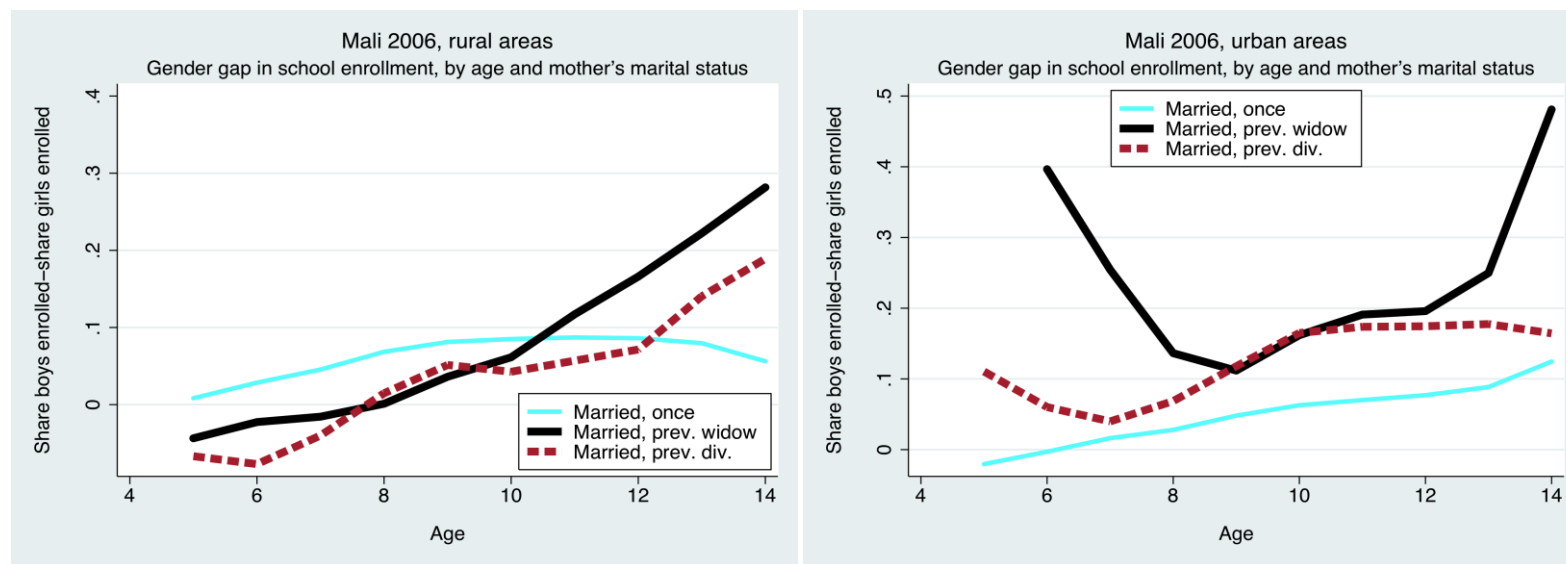
Source: 2006 Mali DHS

Figure 12: School enrollments of cohabiting dependent children aged 5-14 by age and mother's marital status in urban Mali



Source: 2006 Mali DHS

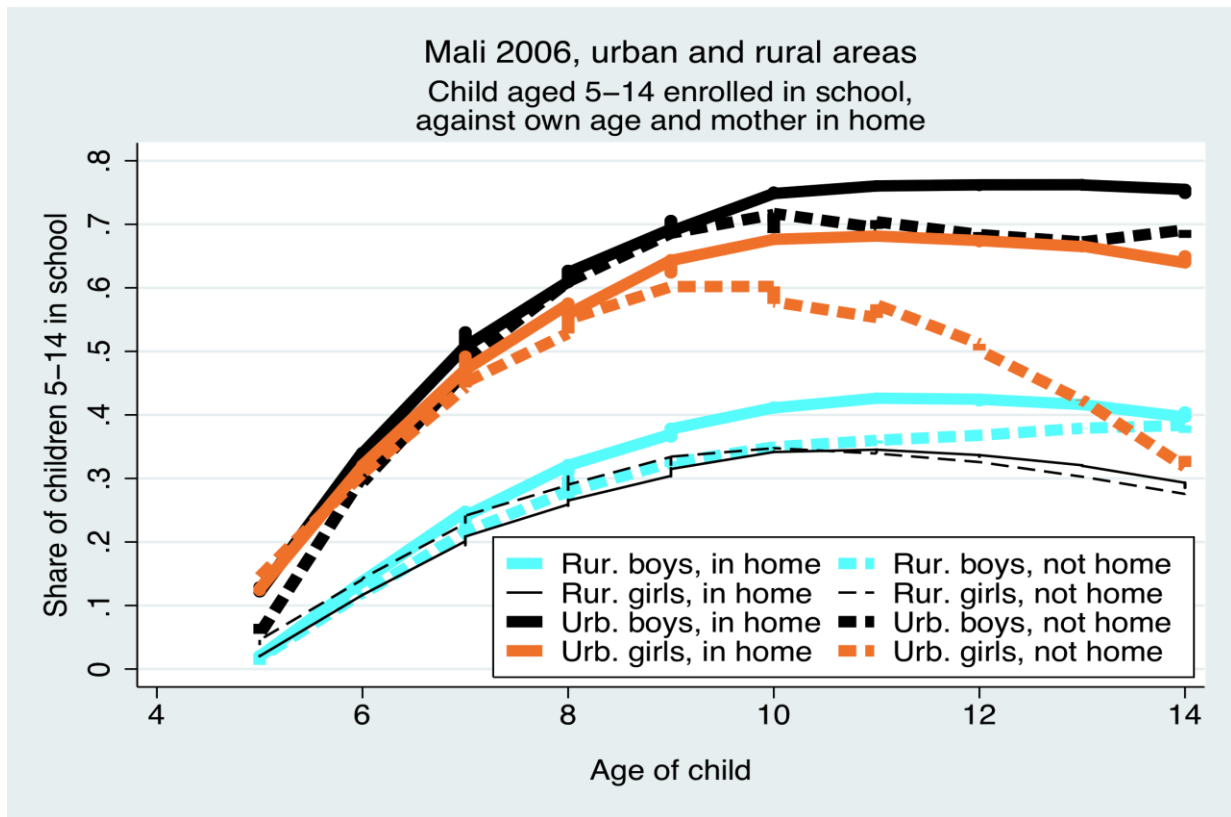
Figure 13: Gender gaps in school enrollments of cohabiting dependent children aged 5-14 by age and mother's marital status, rural and urban Mali 2006



Note: The samples of current widows and current divorcees are left out given their smaller sample sizes. Note also that there are some small-sample problems with the married, previously widowed group in urban areas -- the samples of boys and girls in each age group averaged about 10-15 observations, but were made missing when samples were below 10 observations.

Source: 2006 Mali DHS.

Figure 14: School enrollments of dependent children aged 5-14 by age and by whether mother is in the home or not, rural and urban Mali 2006



Source: 2006 Mali DHS.

Note: Mother may or may not be alive. The figure limited to mother alive, is qualitatively very similar.