WPS8549

Policy Research Working Paper 8549

Nutrition, Religion, and Widowhood in Nigeria

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WORLD BANK GROUP
Development Economics
Development Research Group
August 2018

Policy Research Working Paper 8549

Abstract

It is known that Muslim women in Nigeria have significantly worse nutritional status than their Christian counterparts. The paper first shows that this difference is explained by covariates including geographic location, ethnicity, household wealth, and women's education. However, on accounting for observable characteristics, Muslim widows enjoy a higher nutritional status than Christian widows, particularly in rural areas. The patterns are robust to including village fixed effects and are confirmed for mixed religion ethnic groups. The data are consistent with more favorable processes following widowhood among Muslims, namely inheritance practices and remarriage options. Data on inheritance and violence patterns by religion confirm that Muslim widows are significantly less likely to be dispossessed of their late husband's property or to be mistreated upon widowhood by in-laws. Muslim women are more likely to be chronically undernourished but less nutritionally vulnerable to this marital shock.

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Nutrition, Religion, and Widowhood in Nigeria

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Keywords: Nigeria, Widowhood, Nutrition, Body Mass Index, Religion

JEL classifications: O15; J12; J16; I31.

[1] The authors are grateful to Caitlin Brown, Sylvie Lambert, Martin Ravallion and Paola Villar for useful comments and to the World Bank's Research Support Budget for funding support. These are the views of the authors and need not reflect those of the World Bank and its affiliated organizations. Corresponding author: Dominique van de Walle, 1818 H St. NW, Washington, DC, 20433; dvandewalle@worldbank.org

1. Introduction

Globally, unmarried individuals have been found to have higher mortality and morbidity than married ones. Anderson and Ray (2018) argue that widowhood accounts for some 35% of excess adult female mortality in Africa. The plight of widows is well documented in the legal, human rights, and sociological literatures on Nigeria.[2] In a 2008 public opinion survey, 58 percent of Nigerians said widows faced a great deal (25%) or some (33%) discrimination relative to other women, and far more than divorced women (World Public Opinion.org 2009). The mistreatment of widows is a grave and recognized concern as evidenced by the many Nigerian-based NGOs focusing on the rights of widows and by special modules in the most recent Demographic and Health Surveys (DHS) concerning violence and dispossession following a husband's passing. Over 42 percent of Nigerian widows are found to be completely dispossessed.

A recent body of research has shown that many African widows face considerable disadvantage, and consequently, large average well-being deficits relative to married women in their first union (Djuikom and van de Walle 2018; Anderson and Ray 2018; van de Walle 2013). The evidence also points to significant heterogeneity across countries, with pronounced hardship in some, and benefits to widows in others (Djuikom and van de Walle 2018). It is clear that their situation depends on the social norms concerning widows that they are subject to. These rules differ between Christian and Muslim widows, suggesting that widowhood may not necessarily have the same consequences for these groups.

For example, the DHS data point to higher incidences of both dispossession among, and violence against, Christian widows compared to their Muslim counterparts. Islamic inheritance law stipulates a better treatment of widows than does customary family law which often applies to Christians (Ostien and Dekker 2010). There is also evidence that the Muslim religion as practiced in West Africa provides a semblance of a safety net, or insurance, to women who have suffered marriage dissolution, through high, and socially expected, remarriage rates facilitated by the continued practice of polygamy (van de Walle 1990; Rehman 2007). One might thus expect widows to fare somewhat better among Muslims.

[2] See for example, Okoye 1995; United Nations 2001; Ekelukwa 2002; Sossou 2002; Emery 2003; Durojaye 2013; NIALS 2013; Genyi and Genyi, 2013.

There are no panel data that directly allow an exploration of the effects of becoming a widow. However, it is feasible to compare the situation of widows and non-widows across religious groups in Nigeria. We do so in this paper using the Nigeria 2008 and 2013 DHS.

The data indicate a striking disparity in the nutritional status of Muslim and Christian women in Nigeria. Christian women as a group have a significantly higher Body Mass Index (BMI)—a standard measure of nutritional status given by weight (in kg) divided by the square of height (in meters)—than Muslim women, with the differential rising with age. This can be seen in Figure 1, which plots BMI and the 95% confidence intervals, by religion and age using nonparametric regressions.[3] Low BMI may reflect heightened stress and undernourishment.[4]

As striking an observation, but one not documented before to our knowledge, is the difference in the association of nutritional status with widowhood. In Figure 2, the sample underlying Figure 1 is disaggregated, separately by religion, into women who have never been widowed and those who have. It is arresting that among Christians, the ever-widowed show significantly lower BMI than non-widowed women from their late 20s. Equally notable is the dissimilar pattern displayed for Muslims. Women have a similar BMI trajectory until the ever-widowed overtake non-widowed women in their mid-30s, although these last differences are not statistically significant. Strikingly, the religious gap in BMI is largest for non-widows, and considerably smaller for widowed women. This is true especially at older ages where more widows are found. In fact, the BMI gap is not statistically significant at ages over 40.

These marked disparities beg explanation. What factors underpin the differences in nutritional status?

Muslims account for roughly half the population of Nigeria but they tend to live in different areas to Christians. The North of the country, where Muslims predominate, has historically been disadvantaged. Poverty levels are much higher there and access to basic social and infrastructure services is considerably worse (World Bank 1996). However, there are overlaps—places with both groups present. Also, while Muslim women tend to receive less schooling, there are overlaps in the distribution of schooling. Given the overlaps in

[3] In this paper, we use kernel weighted local polynomial regressions.

[4] An individual is typically considered underweight if BMI is less than 18.5; and overweight if it is 25 and above. Based on the pooled DHSs for 2008 and 2013, rural Muslim Nigerian women have an average BMI of 21.6 compared to 23.0 for Christian women. In urban Nigeria, the averages across the two groups are 23.2 and 24.3 respectively.

characteristics, we can distinguish the effect of religion from those characteristics. Thus, we can ask to what extent the nutritional disparity between religious groups is attributable to observable differences in location or poverty, and its manifestation in various attributes such as educational attainments. We also examine whether the striking nutritional disparity evident in Figure 1 is widening or narrowing over time.

These questions have bearing on the appropriate policy responses. If the gap remains in large part once one controls for factors such as household wealth and women's education, then it suggests that it will not be easily changed in the processes of economic and human development, but will require specific efforts to change potentially deeply-rooted behaviors associated with religion, interpretable as institutional differences. Alternatively, if the gap is largely explicable in terms of poverty and schooling, say, then one expects it to be amenable to more familiar development policies aimed at sharing prosperity and promoting human capital development.

The paper aims to better understand the sources of the observed differences in BMI between Christian and Muslim women in Nigeria with a specific focus on widows. It demonstrates that the Muslim BMI disadvantage is almost entirely explained by differences in location, living standards, education and ethnicity. Controlling for these factors, religion plays a negligible role in the overall sample. Marital status is found to matter and differentially so for Christian and Muslim women. In particular, relative to married-once women in each religious group, current widows are found to be disadvantaged among Christian but not among Muslim women. Moreover, conditional on other covariates, Christian widows have significantly worse BMI than do Muslim widows, so that the BMI religious gap is *reversed* among widows.

We discuss possible sources of selection and provide some evidence against the possibility of differential selection into widowhood by religion. We also conduct several robustness checks. The patterns found among widows are confirmed—and *stronger*—after the inclusion of village fixed effects and for mixed religion ethnic groups. This provides strong support for the relevance of religion-specific norms regarding widowhood in explaining our findings independently of other factors that may drive differences across religious groups due to individuals living in different places or belonging to different ethnic groups.

The paper also finds suggestive evidence of overall improvements in nutritional status between 2008 and 2013 with a falling differential across the groups. In both urban and rural

areas, Muslim women experienced significantly higher gains in BMI. Qualitatively similar results are confirmed for rates of underweight.

We acknowledge that the causal attribution to marital status—and specifically widowhood and the remarriage of widows—is difficult to prove conclusively. We cannot fully rule out the possibility that there are latent differences between Christian and Muslim women in the selection process leading to widowhood, though our results are robust to the use of extensive controls for observables and to several checks. However, our main focus here is on the different processes that the sequel to marriage dissolution takes across the two religions. A more or less equal share of Muslim and Christian women experience widowhood. But once it happens, cultural and religious norms combine with a women's reproductive history and attributes, to determine a widow's welfare and life outcomes. Our interest is in describing these processes and investigating whether Muslim widows fare better despite their worse overall endowments.

The paper's key finding is that among Christians, widowhood is associated with worse nutritional status while it is the opposite among Muslims. This effect is so strong that Muslim widows turn out to have better nutritional status than Christian widows. The paper finds that, all other things being equal, the average Muslim woman fares far better nutritionally and is less afflicted by dispossession and abusive behavior from her in-laws, when the shock of widowhood befalls her.

The paper begins with a discussion of the Nigerian context and a review of the relevant literature. Section 3 describes the data and preliminary descriptive statistics, while Section 4 investigates the determinants of the differential in nutritional status for Muslim and Christian women aged 15 to 49 using regression decomposition analysis. Section 5 further explores differences by marital status and performs robustness and sensitivity checks. Section 6 concludes.

2. Women and legal systems in Nigeria

Islam and Christianity are the two main religions in Nigeria, each comprising roughly half of the population.[5] Although geographically concentrated, populations adhering to one or the other religion are both found in most of the country's states. Moreover, while most ethnic groups are of a common religion—for example, the Hausa-Fulani are predominantly Muslims,

[5] The small remaining share subscribes to forms of indigenous worship.

while the Igbo are Christians—there are also some mixed religion ethnic groups, the largest of which are the Yoruba and Igala. This cultural and religious diversity is reflected in the variety of customary practices and legal traditions regulating family law with bearing on marriage, divorce and inheritance, and thus, women's welfare generally.

The sources of law draw on three main legal systems: English common law (including statutory law), customary law, and Islamic law. The indigenous law of Nigeria is customary law, with each ethnic group traditionally having its distinctive set of norms and laws (Oba 2011). Islamic Law applies to Muslims across the country, but is more enforced in the northern states where they are more numerous. The Constitution is the supreme law of Nigeria and formally recognizes both customary and Islamic law (Hallward-Driemeier and Hasan 2013). English common law is thus the default in the absence of customary or religious law (Emery 2005).

Muslims are concentrated in the northern part of Nigeria, which is poorer and more rural than the South where the majority of Christians are found.[6] Home to nearly half of the poor and only one-third of the total population, the North fares worse in terms of the availability and quality of public basic social and infrastructure services (World Bank 1996). These inequalities are reflected in worse social indicators with higher infant mortality rates and lower levels of assisted births, vaccinations, and contraceptive use on the health side, and lower primary and secondary enrollment ratios and eventual schooling attainments, on the education side (NPC and ICF International 2014).

Nigeria is also a country of extraordinary ethnic diversity. The population encompasses around 374 ethnic groups among which the largest: the Hausa-Fulani (31.3% of the population), Igbo (15.1%), and Yoruba (16.1%), are geographically concentrated in the northern, south-eastern, and south-western parts of the country, respectively.[7] The other ethnic groups each account for small shares of the total.

Marriage is nearly universal and first occurs at young ages for many women: about 30 percent of all girls between the ages of 15 and 19 have been married at least once and the share rises to an even larger 41 percent in rural areas. By 35 virtually all women have been married, while men reach that milestone around age 40. The state of widowhood is considerably more

[6] Nigeria is administratively structured into 37 states grouped into six geopolitical zones: North Central, North East, North West, South East, South South, and South West. The distribution by zone is as follows: (12.3, 23, 50.6, 0.1, 0.7 and 13.4%), (16.3, 5.1, 4.9, 23, 27.1 and 23.6%) for Muslims and Christians, respectively.
[7] These and the statistics below are based on the pooled 2008 and 2013 DHSs. We discuss data sources in Section 3.

common among women than men: about 1 percent of all Nigerian men are widowers while 9 percent of women are widows. Strikingly, while the share of widowers among men aged 75 and older is about 11 percent, it is 77 percent for women of the same age. This pronounced divergence by gender reflects a combination of large age gaps between spouses, higher remarriage rates as well as surviving spouses for polygamous men, and the longer life expectancy of women.

Inheritance: In Nigeria's patrilineal society, a woman's rights to property, such as land or housing, are typically dependent on her relationship with a man—usually a father, husband or brother. A widow's right to inherit from her late husband is formally recognized by statutory law. But this is a moot point since the majority of marriages are contracted under customary or Islamic law.[8] Under the former, women are not in general accorded inheritance rights (Ostien and Dekker 2010; Hallward-Driemeier and Hasan 2013).[9] In some instances and with variation across ethnic groups, this can depend on whether the widow has children with the deceased husband, whether any are sons, and whether she has remarried, with further distinction based on whether this is within the husband's lineage and in a polygynous or monogamous relationship (NIALS 2013). Widows with children, and particularly sons, may be allowed to retain possessory (not proprietary) rights on the conjugal home or hold the estate in trust for male children who are minors. Others are deprived of the custody of their children under the customary view that offspring belong to the deceased's lineage. Under customary law, childless widows can be asked by their in-laws to leave the matrimonial home. Numerous anecdotes suggest that this happens also to widows with children. Examples of property seizures and abandonment by in-laws are legion in the South of Nigeria. Attesting to the extent and abusive aspects of such events are the many NGOs active in the country's Southern States who focus on the rights of Christian widows, heightening awareness among the public, providing counseling, legal advice, and other forms of support.[10]

Inheritance practices under Islamic law are more favorable to women. The Koran instructs that a deceased man's property be inherited by his widow(s), his (male and female)

[8] It is still rare for Nigerians to contract solely a statutory marriage, and conflict between customary and statutory law often results (Rahamatian 1996).
[9] The Women's Economic and Legal Empower Database for Africa (Women LEED Africa) can be retrieved at: http://siteresources.worldbank.org/EXTGENDER/Resources/Women_LEED_Africa_Database.xlsx.
[10] For example, Widows Development Organization (WIDO) active in Enugu State; and the Nigerian branch of the International Federation of Women Lawyers (FIDA).

offspring and his relatives, and specifies each's share. Upon a man's death intestate, his widow is entitled to one-fourth of the estate if childless and to one-eighth if she has children or grandchildren with him. Polygynous co-wives share the one-fourth or one-eighth equally (Ewelukwa 2002; NIALS 2013).

On paper then, the legal traditions suggest that Muslim widows may be better protected and the view is reflected in the literature (Ostien and Dekker 2010). However, whether laws—statutory, customary or religious—are in fact abided by and enforced is another matter. Islamic law is superimposed on long-standing customary practices that may be hard to fully extinguish, especially when inheritance is at stake. What happens in reality is examined by Peterman (2011) for the 15 Sub-Saharan countries, including Nigeria (for 2008), for which a DHS collected a special inheritance module. Ever-widowed women aged 15-49 are asked who inherited most of their late spouse's property. Peterman finds that less than 28% of Nigerian widows inherited most of the property. Interestingly, in Peterman's country-specific regressions investigating the probability that a widow gets any inheritance from her husband controlling for demographic, economic and geographic characteristics, a dummy for being Muslim is positive and significant, and has more explanatory power than the other covariates in the Nigeria case (although this is not discussed by Peterman). We revisit these data to probe deeper for differences in the experience of Muslim and Christian widows.

The consequence of inheritance for women's economic and social support is reviewed by Cooper (2010); also see Cooper and Bird (2012). Its critical nature is fully perceived by women themselves as suggested by evidence of behavioral responses to the risk of widowhood. Although understudied, such responses are documented in recent work. The risks of widowhood are one possible explanation for findings of son-preference in the literature. Milazzo (2014) provides evidence for son preference in Nigeria. Women with earlier-born daughters significantly and dangerously increase their fertility, use fewer contraceptives, and reduce birth spacing relatively more than those with first born-sons. More direct evidence of the link to widowhood is found in Lambert and Rossi (2016) who show that Senegalese women whose husbands have children from other marriages, and hence 'rivals' for his inheritance, reduce birth spacing and increase the number of pregnancies to potentially dangerous levels in the attempt to have a son as insurance against widowhood. Finally, Dillon and Voena (2017) demonstrate that married couples make significantly lower productive investments in land in Zambian villages

where customary norms do not support land inheritance rights for widows.

Treatment of widows: The potential ill-treatment of widows is not only related to unfavorable inheritance practices. The shock of widowhood entails a loss of economic means, including access to productive assets such as land that are conditional on marriage, of protection and of status previously derived from a husband. The bereaved woman must also frequently endure dehumanizing and abusive rituals that are customarily part of the mourning process across Nigeria (Sossou, 2002). These typically include degrading rites and extended periods of seclusion meant to showcase the intensity of sorrow over the man's death, prove the widow's innocence in that death and ensure that she cannot be impregnated by another while there is uncertainty of whether she bears his child (Ewelukwa 2002; Sossou 2002; Durojaye 2013; NIALS 2013). Such indignities have been a particular focus of NGOs working with widows. Widowers, it goes without saying, are not subject to the same practices.

Some protection for widows may be provided by the opportunity to remarry. The levirate and widow inheritance—traditions once common in much of Sub-Saharan Africa in which a widow remarries into her late husband's lineage—aimed to protect the woman and her children, as well as the descent's investment in her bride price by further capitalizing on her reproductive and labor capacity (Iroegbu 2007). A widow can generally refuse this option, but may then be forced to leave her children behind. Historically widespread across ethnic groups in Nigeria, the tradition appears to be in decline, although unevenly across the country.[11] The influence of Christianity significantly reduced its prevalence among the Igbo and other converts (Kirwen 1999). The spread of monogamy under Christian teaching has also worked to restrict remarriage prospects. More economically independent widows are less willing to accept a levirate marriage (Ewelukwa 2002). Among certain ethnic groups who adhere to Christianity, remarriage although tolerated, can be thwarted by the stipulation that the widow or future husband repay the original bride price (Okoye 1995). Christianity may have other dampening effects on remarriage which, as shown below, trails among Christian relative to Muslim widows.

In contrast, Islamic law encourages widows' remarriage whether through the levirate or outside the lineage. Social pressures to remarry and continue to procreate are especially pronounced for young widows. When widows remarry, particularly among Muslims, they are often absorbed into polygynous households as lower-order rank wives. Polygamy therefore

[11] The lack of national data on the levirate makes it difficult to know exactly how prevalent it remains.

appears to be associated with higher remarriage rates. In a context where women's rights and access to property remain linked to men, remarriage can be a life saver.

A small literature in economics documents the predicament of widows in various situations in other African countries. In Uganda, Zimbabwe and Mali, studies investigating the well-being of female-headed households find that among them, widow-headed households are particularly disadvantaged (Appleton 1996; Horrell and Krishnan 2007; and van de Walle 2013, respectively). In the context of HIV/AIDS deaths, Chapoto et al. (2010) find evidence that households headed by widows whose husbands succumbed to illness are more vulnerable to losing control of agricultural land in Zambia. A number of studies have documented similar situations in Kenya, Lesotho and Southern Africa more generally (Drimie 2002).

Elsewhere in the developing world, a literature focuses on the plight of widows in South Asia, and particularly India where widows also face many social and economic constraints (Chen and Drèze 1995; Drèze and Srinivasan 1997; Chen 2000; Jensen 2005). Jensen (2005) analyzes the well-being of widows as proxied by their nutritional status. Wealthier upper-caste widows are found to be no better-off than poorer lower-caste widows. This is explained in part by the more severe restrictions placed on their behavior, socio-economic opportunities and remarriage options. Lloyd et al. (2015) compare various socio-economic and health attributes of widows aged 50 and older across five countries (China, India, the Russian Federation, Ghana and South Africa) and find evidence of disadvantage but also variance in its manifestation.

3. Data and descriptive statistics

The analysis uses two nationally representative cross-sectional samples of women aged 15 to 49, pooled from the Nigeria Demographic and Health Surveys of 2008 and 2013. We create a data set that draws on the household-level questionnaire for information on each household, its head and other members, and on the women's questionnaire for information on women's anthropometrics, marital status, religion, age, education and other relevant individual characteristics. The latter questionnaire is administered to all women in the 15 to 49 age range.

Individual welfare indicators: An advantage of the DHS for this purpose is that it provides an individual measure of adult women's welfare, namely nutritional status as indicated by her BMI. We also use an indicator for being underweight, equal to one if a woman's BMI is lower than 18.5 and zero otherwise. It has become common to use nutritional status as an

indicator of individual economic well-being in the economic literature focusing on developing countries (Steckel 1995; Jensen 2005; Sahn and Younger 2009; Molini et al. 2010). Using BMI, van de Walle (2013) identifies relative disadvantage for ever-widowed women relative to others in Mali. DHS-reported BMI is based on physical measurements, and arguably more objective than self-reported measures of health status. Sahn and Younger (2009) argue that the advantages of using BMI (as opposed to, say, household consumption) include that it is measured at the individual, not the household level; it reflects command over food but also sanitation conditions; it accounts for caloric consumption relative to needs; and errors in its measurement are likely to be random (also see Steckel 1995).

From a health standpoint, BMI can also be too high. Obesity is an increasing concern in developing countries, as it has been in the developed world for some time. A systematic review of studies on the prevalence of obesity among adults finds that about 20 to 35 percent of Nigerians are overweight, while 8 to 22 percent are obese (Chukwuonye et al. 2013).[12] Importantly, while socio-economic status is negatively associated with obesity in developed countries, this association is usually found to be positive in developing countries (McLaren, 2007). For example, Wittemberg (2013) finds that the relationship between BMI and socio-economic status is non-decreasing over the entire range of income/wealth in South Africa and this relationship holds for other countries in SSA. In this paper our focus is on the lower end of the BMI distribution and potential undernutrition as opposed to obesity.

A positive relationship between marriage and BMI has been documented for many countries, both developed and developing.[13] In Ethiopia, single women are more likely to be undernourished relative to currently married women (Girma and Genebo 2002). Given high marriage rates, almost all single women are adolescents or young, when nutritional needs increase substantially due to the spurt of growth. Early childbearing may further deteriorate a young woman's nutritional status.

Covariates and other variables: All regressions, described below, control for a large set of individual and household level characteristics, a dummy for the 2013 survey round, and state

[12] 24% of women15-49 are overweight (BMI of 25 or higher) and 7% are obese (30 or higher) based on the pooled 2008 and 2013 DHSs. 11% are underweight (BMI lower than 18.5). These means mask significant geographic variation: overweight rates are highest in the South (around 31%); underweight is highest in the North East and North West at 17% and 15% of all women, respectively.

[13] See Jeffery and Rick (2002) for the US, Tavani et al. (1994) for Italy; Nagata et al. (2009) for Guatemala; Girma and Genebo (2002) for Ethiopia.

fixed effects.

Luckily, both DHS rounds include information on marital history for women who are currently married but report having had a prior union. This information is rarely collected in surveys and not available in previous rounds of the Nigeria DHS.[14] It allows us to construct a marital status variable that differentiates among currently married women to include the following categories: single, married in first union (i.e., married once), married and previously widowed, married and previously divorced or separated, currently widowed, and currently divorced or separated. Even so, these variables do not encompass a woman's entire marital history: although we know how a remarried woman's last union ended, information is not available for all possible prior unions. Similarly, for current widows and divorcees, no detail is collected on previous unions other than that there was one or more. It would, for example, be useful to know when a dissolution occurred and hence the duration of widowhood or divorce.

In addition to a woman's marital status, other individual level covariates include the woman's age and its square, years of education, whether pregnant, head of household or the head's spouse, and her ethnic group.[15] We are able to control for the five major groups: Hausa, Fulani, Igbo, Yoruba, and Igala, as all have at least some within-group religious variation (these are entered as five dummies). Characteristics of the woman's household include size and composition (shares of members aged 0-5, 6-14, 15-64, 65 and over, all by gender)[16]; the head's gender (one if female), age, age squared, and education; and the log of the household's DHS-computed wealth index.[17] The last could raise endogeneity concerns. Against that, omitted variable bias is likely to be a potential concern if we exclude wealth, so we leave it in. That said, leaving the wealth index out makes little difference to the variables of interest.

Religion is asked of all interviewed women. Note that there is heterogeneity among Christians as we aggregate Catholics and other Christians together. The same can be said of

[14] The marital status of household members is collected in the household questionnaire. Details on marital history are from the women's questionnaire and thus available only for the 15-49 group. 'Married' includes women who report cohabiting with a man (1.8% of the sample). The divorced and separated are also grouped together. 'Currently separated', and 'remarried, previously separated' women account for 1% and 1.9% of all women, respectively.
[15] We also tested controls for age at first marriage and first birth, husband's education and whether polygamous. The results are qualitatively the same. As these characteristics do not apply to all women (e,g. single women), we prefer to omit them rather than restricting the sample further. Results available upon request.
[16] The share of male members aged 65 and over is the omitted household composition group.
[17] The wealth index is a proxy for household welfare generated using principal components analysis on assets; housing construction materials; and type of water access and sanitation facilities. The index places households on a continuous scale of relative wealth.

Muslims as different variants of Islam are practiced across Nigeria (predominantly Sunni with a Shia minority).

The 2008 and 2013 DHSs also fielded questions of particular relevance to this study. The surveys also asked ever-widowed women (i.e., current and remarried widows) about who received most of their deceased husband's property. Possible responses include: the respondent, another wife, the dead man's children, his family, other, and husband had no property. The widow is also asked whether she was dispossessed of property, defined as not having received any of her late husband's assets or valuables.

The 2013 round additionally asks current widows whether they experienced ill-treatment by in-laws. As discussed in section 2, abusive rituals and other forms of mistreatment inflicted by the late husband's family are thought to be a common human rights issue in Nigeria. The questionnaire asks about violence perpetrated by the husband's relatives, including whether the respondent was: blamed for the death, compelled to undergo cultural practices to prove her innocence, physically or verbally abused, and/or maltreated. Whether her children were ill-treated is also queried. Unfortunately, the question was not asked of remarried widows, which makes it impossible to assess whether remarriage is associated with such violence, and results in a small sample size, particularly for Muslim women.

We impose a few sample restrictions. As the focus is with Muslim and Christian women, those who subscribe to a traditional religion (1.1 percent of the sample) are dropped. Observations with missing information for key variables, including a woman's BMI, marital status, religion, ethnicity, education, whether she is the head of household, and age and education of the head are also omitted (5.8 percent of the surveyed sample).[18] This results in a sample of 66,320 women, of which 31,590 are Muslim and 34,730 are Christian. Muslims make up 55 percent of the rural and 39 percent of the urban sample. A total of 1782 villages are included in the pooled dataset. There is religious variation in 711 villages (around 40 percent).

Summary statistics: Table 1 reports key summary statistics for our sample of women aged 15 to 49, by religion and urban and rural location.[19] A number of between-group differences in mean attributes stand out. Muslims complete considerably fewer years of education—about 6 years less in rural and 4 less in urban areas. Gaps of similar size are apparent

[18] We consider women who are usual resident members of the household and drop those who report being both the head's spouse and not being married (57 women).
[19] All graphs and tables with summary statistics use survey weights provided by the DHS.

for their husbands and the heads of the households they live in. Consistent with their lower levels of schooling, average age at first marriage is appreciably lower for Muslim women—15.5 and 17.6 in rural and urban Nigeria respectively, compared to 19.0 and 21.4 for Christian women.

Muslims live in households that are larger, have higher dependency ratios, and are more likely to be male-headed.[20] The fraction living in female-headed households is 5 (14) percent in rural (urban) for Muslims, while it is 26 (28) percent for Christians. Consistent with this, the probability that a woman is the head is lower for Muslims, while the opposite is true for being the spouse of the head. These differences are larger in rural areas.

Table 1 also exposes quite distinctive marital profiles by religion. Singlehood is much more frequent among Christians and in urban areas, consistent with higher age at first marriage among them. The opposite holds for married once women, who account for 79 percent of rural and 64 percent of urban Muslim women compared to 55 and 53 percent of Christian women.

Figure 3 delves a bit deeper into marital history, omitting singles and married once women to focus on the relative prevalence of remarriage among ever-widowed and ever-divorced women. Controlling for age, incidence is shown by religion for rural (Figure 3a) and urban (3b) areas. Among rural Christians the fraction of current widows increases steadily starting around 22 years of age and then much more precipitously for women in their late 30s to reach a high of over 20 percent of women who are 49 (Figure 3a). Among Muslims, there are far fewer current widows among women under 40, when their share rises slowly to reach a maximum of less than 5 percent of women aged around 50. These patterns, together with those observed for married, previously widowed women, are consistent with significantly higher remarriage rates among young Muslim women who experience a husband's death before they turn 40.[21] Indeed, a large majority of Muslim widows are older than 49. Divorce and separation appear to be more prevalent among Muslims, and remarriage rates are extremely high here as well. For Christians, the remarriage of divorcees is more common than that of widows, but still less frequent than for Muslims. Comparing Figures 3a and 3b, we see that in urban areas, where being single is more widespread for both groups, remarriage prevalence is similar to that in rural

[20] The dependency ratio equals the number of members less than 15 and over 65 to the number aged 15 to 64.
[21] Regressions indicate that unconditionally, the probability of remarriage for widowed women is 43% higher for Muslim than for Christian women in rural and 29% higher in urban Nigeria. Conditioning on age and age squared, years of education, height and the household's wealth index, reduces the differential to 37% and 24% in rural and urban areas, respectively.

areas, except that Muslim widows and divorcees remarry less from an earlier age.

Table 2 presents selected summary statistics for women further disaggregated by marital status. There are some notable patterns. Remarried widows have the lowest mean years of education in both groups in rural and urban areas. Age, and rising schooling levels over time, could account for part of this. However, it can also be observed that, although on average older, current widows have somewhat higher educational attainments among Christians and the highest average among rural Muslim women. The abysmally low schooling of remarried widows (and less so remarried divorcees) probably also reflects the fact that among widows, those from more disadvantaged socio-economic backgrounds have a more pressing need to remarry, consistent too with their lower age at first marriage. As noted, most Muslim widows under 40 remarry.

Muslim widows and divorcees typically remarry polygynous men. Whereas the share of married once women with a polygamous husband is 43 in rural and 31 percent in urban areas among Muslims and 19 and 9 percent respectively for Christians, these fractions are much higher for remarried women in both groups: close to two-thirds of Muslim and half of Christian remarried women have polygamous husbands. While remarried women are reabsorbed into male-headed households, current widows and—to a lower extent—divorcees are more likely to live in a female-headed household and to be the head. Some women have experienced multiple marriage breakdowns. Indeed, the share of rural widows and divorcees who have been married only once is 84 and 77 percent for Muslims and 91 and 85 percent for Christians, respectively. The shares are similar, though slightly higher for both groups, in urban areas.

The bottom of Table 1 presents statistics for the following nutritional status indicators: BMI, shares considered underweight, and height (reflecting nutrition during childhood). Overall, Christian women exhibit higher BMI, are less likely to be underweight, and are taller. For example, the shares of Muslim women who are underweight are 16 in rural and 12 percent in urban areas—double that of Christian women. In line with international evidence (Garenne 2011), BMI is an increasing function of age as seen in Figure 1. It can also be seen that the BMI religion gap rises to age 35 approximately, where it is about 2 BMI points.

Nutritional indicators by marital status are given in Table 2. The most relevant aspect is shown in Figure 2 where ever-widowed women are distinguished from those who have never been widowed for the two religious groups. As already discussed in the introduction, beyond their late 20s ever-widowed Christian women have significantly lower BMI than their non-

widowed counterparts. In contrast, there are no BMI differences among Muslim women until the ever-widowed overtake non-widowed women in their mid-30s. The latter differences remain statistically insignificant. Most strikingly, the BMI religious gap is largest for non-widows, and otherwise small or not statistically significant for widowed women, particularly at older ages where widowhood becomes more common.[22]

Figure 4 provides a pictorial representation of the unconditional differences between Muslim and Christian women in average nutritional status—as reflected in mean log BMI and underweight disparities—by marital status. The differences are predicted based on a regression of log BMI on a dummy variable for Muslim, dummies for marital status, and interactions between Muslim and each marital status.[23] The zero line indicates no difference between women of the two religious groups and 95% confidence intervals for the difference by marital status group are given. The top rural panel shows that the largest gap, of close to -0.1 log BMI points, is for married once women, and the smallest—and insignificant—gap is for widows. Given the small number of widows in the sample, the confidence intervals are large. In urban areas, remarried and current widows exhibit the smallest, and insignificant, gaps. The bottom panel shows the unconditional religious differences in the shares of underweight women by marital status. This addresses the issue of inequalities among the nutritionally worst off. The patterns essentially parallel those for BMI. Here too, the unconditional disparities are smallest for widows, followed in urban Nigeria by that for remarried widows.

The DHS asks about specific factors that prevent women from obtaining medical advice or care for themselves. We consider two factors: getting permission and sufficient money. The shares of women agreeing that each is a constraint are shown in Tables 1 and 2 as the final two outcomes. Overall, Muslim women report themselves to be more constrained with respect to obtaining permission (20 and 11 percent in rural and urban areas respectively) than Christian women (8 and 6 percent). Financial constraints to seeking health care are a self-reported barrier for the majority of women in rural areas and over a third in urban areas. Delving deeper by marital status, it is noteworthy that the constraint is considerably more pronounced for Christian

[22] Note that it is the numerous singles at young ages who lower the non-widow line among the Christians.
[23] To compute predicted (ln) BMI and share of underweight we use the STATA margins command. The predictions are calculated at the mean sample values of the included variables (i.e., shares of Muslim and Christian, and of each by marital status).

widows: 71 percent in rural and 53 in urban areas report this as a handicap. This is well above the average shares for other women (Table 2).

4. Explaining the religion differential in nutritional status

The differences by religion described in the previous section could reflect numerous factors. To explore the determinants of women's nutritional status, we regress the natural log of BMI for the *i*th woman in religious group *r*, living in state *k*, at time *t* against a set of attributes X_{irkt}, allowing for a religion effect α_r, state fixed effects η_k, and a year effect δ_t, as follows:

$$\ln BMI_{irkt} = \beta X_{irkt} + \alpha_r + \eta_k + \delta_t + \varepsilon_{irkt} \qquad (r=C, M;\ t=2008, 2013) \qquad (1)$$

Here ε_{irkt} is an error term. As described in Section 3, the controls include all variables in the data set that may be expected to affect current nutrition. We use OLS on the full sample of women aged 15-49, and run the regressions separately for urban and rural areas. A similar regression is then run for underweight using a linear probability model. A limitation of the specification in (1) is that it does not allow the returns to characteristics or the state and time effects to vary by religion. For this reason, we also estimate separate regressions for each religion in which all coefficients are allowed to vary by religious group.

In all regressions, robust standard errors are clustered at the village level.

Regressions for BMI: We examine the unconditional overall BMI difference between the two religious groups. Columns (1) and (5) of Table 3 present the regression of log BMI on a dummy for being Muslim, followed by regressions in columns (2) and (6) that add all the covariates as well as state fixed effects.

Unconditionally, rural Muslim women have approximately 6.5 percent lower BMI on average than their Christian counterparts (statistically significant at the 1% level).[24] However, as can be seen in column (2), the average rural BMI gap—reduced to a statistically insignificant 0.6 percent—is largely explained by the covariates. Here, the marital status coefficients indicate that single (widowed) women have 4 (1) percent lower BMI (significant at the 1 and not quite 10% levels (p-value of 0.102), respectively) than married once women (the omitted category). The nutritional disadvantage of single women echoes evidence from Ethiopia (Girma and Genebo

[24] Here and in what follows, we refer to differences in logs consistent with the estimates in Table 3. Strictly, the corresponding percentage difference is 6.3% in this particular case ($(e^{\beta} - 1) = -0.063$) when $\beta = -0.065$).

2002) and elsewhere. The negative effect for widows is consistent with the earlier reviewed evidence that Nigerian widows face economic and social difficulties.

The estimated coefficients on age reflect the patterns seen in Figure 1, with BMI rising with age but at a slower rate as women get older. Each year of completed schooling increases women's nutritional status by 0.3 percent (significant at the 1% level). Unsurprisingly, pregnancy is strongly positively associated with BMI. Household structure plays a larger role than household size, as shown by the insignificant coefficient for the latter and the significant (negative) association with larger shares of children, especially young ones (the share of men 65 and older is omitted). Living in a female-headed household, being the head or the head's spouse are all linked to higher BMI (the coefficients are large and highly significant). The head's education has its own role, equal to a third of the effect of the woman's own education. As one might expect, the wealth index is positively associated with BMI (significant at the 1% level). Ethnicity plays a key role, with Hausa-Fulani women having significantly lower BMI and those from the mixed religion Yoruba and Igala groups enjoying higher BMI. This correlation is found despite state fixed effects, suggesting ethnic-specific factors that affect BMI over and above location.

The positive and significant dummy for the later survey year indicates that, controlling for other factors, Nigerian women's BMI increased between 2008 and 2013. As noted, the regression specification in column (2) obscures the possibility of catching up over time, or indeed, of any other parameter differences between the groups. Separate regressions for each religious group address this concern. Columns (3) and (4) of Table 3 present the results when all coefficients are allowed to vary by religion. Although BMI rose for both groups between 2008 and 2013, the improvement disproportionately favored rural Muslim women. Their BMI rose a dramatic 2.9 percent over the five-year period, or 0.6 percent annually. This was considerably higher than the 0.2 annual percent increase experienced by Christians (t=3.95 on the difference). These results are encouragingly suggestive of convergence. However, an important caveat is in order. As in the rest of the world, 2008 was a high food price year in Nigeria. The estimates may simply reflect a recovery rather than a trend. For example, the poorest may have struggled to feed themselves more so than the less poor, resulting in the food price crisis affecting Muslims and Christians differentially. Against that, rural food producers, more numerous among Muslims, may have been better protected and able to rely on non-traded staples such as yams more so than

net consumers.

Comparing columns (3) and (4), there is heterogeneity by marital status. Holding other things constant, single women have worse BMI than their married once counterparts in both groups (the between-group difference is not statistically significant). Interesting patterns emerge when comparing the coefficients for widows. Muslim widows enjoy a 2.4 percent *higher* BMI than Muslim married once women, while the opposite is found for Christian widows with a 2.3 percent *lower* BMI than their own married counterparts. The difference between the coefficients on current widows by religion is statistically significant at the 1 percent level (t=3.23).

Among Muslims, currently divorced women also have higher BMI than married once women, and the difference with Christians is statistically significant at the 5 percent level (t=2.20). This may reflect the fact that a majority of rural Muslim women (about 90 percent) who divorce or separate from their husbands eventually remarry (Figure 2). Those that do not may have chosen not to do so or simply be between marriages.

Other pronounced differences in the returns to characteristics emerge from the comparison of the rural group-specific regressions. We highlight the statistically significant differences. The contribution of each year of education to BMI is larger for Christian women (we can reject equality of the coefficients at the 1% level, t=-3.37). Thus, Muslim women not only reach lower levels of education, they also achieve lower "nutritional" returns for each completed year. Pregnancy is more strongly associated with BMI among Muslims (t=1.67). For Muslims too, a large and significant nutritional advantage is associated with being the head or the head's spouse, effects that are not present for Christian women. However, the difference is significant only in relation to being the head (t=2.30; and t=1.34 for being the head's spouse). Among the Yoruba, a mixed ethnic group, Muslim women enjoy higher BMI (t=3.32 on the difference). The difference in the joint effects of the state-of-residence coefficients is statistically significant (F(35,1131)=11.86).

In urban Nigeria, the unconditional average gap in BMI is lower at 4.6 percent, but still favors Christian women (column 5). As in rural areas, the gap is fully explained by the covariates (column 6). The estimated coefficients are generally similar to those for the rural sample with some exceptions for the ethnicity and the marital status dummies. Columns 7 and 8 show the models separately by religious group. The statistically different (Muslim minus Christian) coefficients are for women's education (t =-2.37), being the head (t =1.78), the head's education

(t =1.89), the wealth index (t = -2.54), Fulani ethnicity (t =1.8), the state fixed effects (jointly different F (31, 649) =16.71), and being married, previously divorced (t =-2.07). The BMI advantage of married ex-divorcees among Christians requires further examination which considers the reasons for divorce and remarriage among them. Note also that although the estimated coefficients on current widow are not statistically significant, they are nonetheless quite large and qualitatively similar to those estimated for the rural sample: a positive 0.016 for Muslim widows and a negative -0.014 for Christian widows.

There are also signs of convergence in nutritional status in urban Nigeria, although the differential rise—2.6 percent increase for Muslims versus 1.8 percent for Christians—was considerably less pronounced than in rural areas.

Regressions for the incidence of being underweight: Table 4 presents the same series of regressions for the incidence of being underweight (which replaces the dependent variable in (1)). Unconditionally and averaged over the two survey years, the probabilities of being underweight were 9.3 and 5.5 percent higher for Muslim women in rural and urban areas respectively. Both differences are statistically significant at the 1percent level. Once covariates are added, the average disparity drops considerably to a still significant 2.8 percent in rural Nigeria, and a negligible and insignificant 0.5 percent in urban areas.

Allowing women's attributes to vary by religion reveals similar patterns to those found for BMI. Here too, impressive improvements were concentrated on Muslims with 4.7 and 2.3 percent reductions in the probabilities of underweight in rural and urban areas respectively, between 2008 and 2013. No change is revealed for Christian women. Encouragingly, these results indicate progress among the nutritionally worst-off Muslim women and here too, point to convergence.

The single and the married previously divorced are found to have a significantly higher probability of being underweight than the married-once among Muslims. For Christians this is true of single women. The differences for widows are not statistically different relative to their own left out group. But the coefficients exhibit the same patterns as for BMI; those for Muslims—at -0.012 in rural and -0.032 in urban areas—are substantial and negative while those for Christians are also substantial but of the opposite sign (0.017 and 0.014 respectively). Across religious groups, the differences are statistically significant only in urban areas (t=-1.92).

Conditional, predicted differences in nutritional status by marital status: Above, we examine whether nutritional status moves differentially with marital status comparing the two religions. We find that, compared to being married once, widowhood is associated with a pronounced cost to BMI among rural Christian women and a similarly-sized benefit among rural Muslim women, with the difference in the coefficients highly significant. The question then arises of what differences we see for each marital status group when conditioning on the covariates. This is investigated by estimating a similar model to the one used to produce Figure 4, with the difference that predicted levels are now conditional of all observables and evaluated at covariate sample mean values.[25] Similarly to Figure 4, Figure 5 shows log BMI levels and rates of underweight and their confidence intervals for each marital status, by religious group and rural and urban area.

In rural Nigeria, Muslim women exhibit somewhat lower or equal predicted average BMI to Christians. In urban areas, the mean differences marginally favor Muslims overall. But these religious differentials are small and statistically significant in favor of Christians only for married once and single women in rural areas. In contrast, Muslim current widows have higher BMI in both rural (statistically significant at the 10 percent level) and urban Nigeria (not statistically significant).

With respect to the probability of being underweight, only the difference for single women survives as significantly in favor of Christians in rural areas. In urban Nigeria, Muslim widows are significantly better off than Christian widows. No other predicted conditional differences are significantly different from zero.

Decomposing the nutritional gap: To further understand the gap in nutritional status and better categorize the sources of the religion differential, a simple Blinder-Oaxaca decomposition is implemented focusing on BMI (Blinder 1973; Oaxaca 1973). The method, widely used to decompose wage disparities, helps to distinguish between the component of a difference between groups that is due to unequal attributes and that due to unequal returns to those attributes.[26]

The model for $\ln BMI_r$ of women in either religious group is as follows:[27]

[25] Specifically, differences in nutritional status are predicted based on a fully interacted model of log BMI on a dummy variable for Muslim, all the covariates (including marital status dummies), and all the interactions between Muslim and the covariates.

[26] See Fortin et al. (2011) for a review of decomposition methods used in economics, including the Blinder-Oaxaca.

[27] Powell et al. (2012) also use the technique to decompose differences in BMI.

$$\ln BMI_r = X_r' \beta_r + \varepsilon_r \quad (r=C, M) \tag{3}$$

where X_r' is a vector of observable individual characteristics (including a constant), β_r the parameters (including the intercept), and ε_r the error term with $E(\varepsilon_r) = 0$. We can thus write the mean BMI gap as:

$$Gap = E(X_C)'\beta_C - E(X_M)'\beta_M \tag{4}$$

To determine the contribution of the characteristics to the mean gap, a 'two-fold' decomposition uses the vector of parameters β^*, obtained by estimating a pooled model of the data for both groups including a dummy for the Muslim religion (Neumark 1988; Jann 2008), to weigh the mean characteristics in the explained part of the decomposition. The mean gap can then be decomposed into the portion that is 'explained' by differences in the characteristics of the groups, and the portion that is 'unexplained' and captures differences in the returns to characteristics as well as the effects of any unobservables, as follows. First, we have the nutrition gap attributed to different characteristics:

$$[E(X_C) - E(X_M)]'\beta^* \tag{5}$$

Next, we have the nutrition gap attributed to different returns to characteristics:

$$E(X_C)'(\beta_C - \beta^*) + E(X_M)'(\beta^* - \beta_M) \tag{6}$$

Table 5 shows the results of the decompositions implemented for rural and urban areas.[28]

The bulk of the gap—90 percent in rural and 88 percent in urban Nigeria—is explained by differences in the observed characteristics of the two groups. In rural areas, the major contributors are divergences in household demographics, ethnicity, wealth and women's education. For example, differences in education raise the gap by about 31 percent, significant at the 1 percent level. Unsurprisingly, being single contributes negatively to the explained disparity: this is because single women have lower BMI than women of other marital statuses and that there are fewer single Muslim women in the 15 to 49 age group.

The mean gap in urban Nigeria is likewise largely explained by differences in women's attributes and similar ones to those found important in rural areas. However, ethnicity loses its salience while location, as captured by the state of residence, play a larger and statistically

[28] The state fixed effects include only states in which both groups are found, to ensure the same set of covariates necessary for the Blinder-Oaxaca decomposition.

significant (at the 1 percent level) role. Although ethnic groups are geographically concentrated, ethnicity and customary norms appear to play a larger role in rural areas.

Only a small and statistically insignificant 10 and 13 percent, in rural and urban area respectively, is left unexplained by differences in the characteristics between the groups. As suggested by the regression results, the difference in "returns" to BMI of being a widow translates into a negative and highly significant (only in rural areas) contribution to the unexplained share, in effect reducing the overall gap.

5. Further tests

Our results so far are consistent with the view that somewhat more favorable inheritance rules, and social norms that more readily accept and encourage remarriage, play a positive role in easing the shock of widowhood for Muslim relative to Christian women, at least as reflected in their nutritional status. In this section, we discuss several concerns that might still be raised about this conclusion.

First, it could be argued that the revealed differences in nutritional status for current widows of the two religious groups are simply due to ethnic social norms, or perhaps geographic factors related to a woman's village of residence. To rule out the first possibility, we exploit the fact that, as previously noted, some ethnic groups contain adherents to both religions. Among the largest are the Yoruba and Igala, mixed religion ethnicities concentrated in the south-west and central regions of Nigeria. Restricting the sample to these groups arguably allows us to better isolate the purely religious factor, purged of ethnic- and location-related influences. Replacing state with village fixed effects to exploit variation within villages additionally helps address the second issue and flush-out unobservable location-specific factors that may well affect differences between the groups. For this last specification, we limit the sample to the 711 villages (364 urban, 347 rural) where women of both faiths reside and identify the coefficients exclusively on within-village differences. This better allows us to zero in on how differences in norms associated with Nigeria's two main religions affect the well-being of widows. The marital status coefficients from these regressions, where all covariates are allowed to vary by religion, are

given in Table 6 for log BMI and the share of underweight.[29]

Columns 1-2 and 5-6 of Table 6 show the estimates for the subsample of women belonging to mixed religion ethnic groups, for log BMI and the probability of being underweight, respectively. There is no overall Muslim nutritional disadvantage. Among rural Christians, the BMI gap for current widows relative to married once women is now larger (-0.044 and significant at the 10 percent level) than that reported in Table 3 (-0.023). As expected, the disadvantage of widowhood among Muslims is more than offset with a positive significant coefficient of the interaction of 0.064. The results for underweight mirror the ones for BMI. Compared to the results shown in Table 4 for the full sample, current widows among rural Christians have a statistically significant and larger probability of being underweight than Christians married once (8 percentage points, significant at the 10 percent level). Similar to the BMI results, this is more than offset among the Muslims. No such Muslim-Christian differences are apparent among the urban Yoruba and Igala ethnic groups.[30]

The regressions with village fixed effects on the subsample of rural villages with religious variation also confirm our findings for log BMI (columns 3-4). The coefficient on Christian widows is unchanged at -0.023 (p-value: 0.102) which, as expected and in accordance with Table 3, is more than compensated for Muslims (the coefficient of the interaction term is in fact 0.050, significant at the 5 percent level). In urban, mixed religion villages, no such disparities emerge.[31] The results for underweight (columns 7-8) are consistent with those for BMI and with higher statistical significance. This evidence goes some way to reassure us that our results are robust and likely driven by religion-specific factors.

The different marital patterns by religion, particularly the differential prevalence and acceptability of remarriage, raise a second concern. Given the pronounced tendency for Muslim widows under 40 to remarry (discussed above), one may conjecture that those who end up not doing so tend to be women who can afford to stay unmarried. There may then be a selection of the worst-off widows out of the current widow status among Muslims. Our analysis compares

[29] This is equivalent to the model estimated to produce figure 5 (which used the full sample). The 'Muslim' coefficient is computed as the conditional marginal effect for married women (dy/dmuslim | married once =1) evaluated at the mean value of the covariates. Its standard errors are computed using the delta method.
[30] The high negative coefficient on Muslim current divorcee (column 1) is an anomaly, due to outliers among the small number of observations (13).
[31] In regressions with village fixed effects on the entire sample, widows are also found to be statistically significantly worse off than married once women among Christians (-0.023 in rural and -0.018 in urban) and significantly better off (interaction terms of 0.037 in rural and 0.033 in urban) among Muslims.

them to Christian widows, a group that contains both the well- and badly-off since a negligible number get remarried.

To investigate this argument more closely, the regressions are rerun on the sample of women aged 40-49 in which it is plausible to assume that Muslim widows either chose not to remarry or find it difficult to do so due to their age. We further disaggregate by education and stature, on the argument that those with low socio-economic status as proxied by a lack of education, and lower than average height, are likely to be in greater need to remarry.[32] This allows us to see whether the results differ by socio-economic strata. If the reversal in nutritional status is concentrated among the well-off (who are relatively more likely to have chosen not to remarry), this would be evidence against our conclusion and in favor of positive selection of current widows.

Table 7 shows the estimated marital status coefficients from the same fully interacted model as before, run on the subsamples of older women with no education and those who completed at least one year of schooling, as well as the subsample of women with below and above average height. Once again, the results strongly confirm the nutritional disadvantage of widows among Christian women and that the detriment is larger for this group of older women than for the whole sample (Table 3), and statistically significant in almost all subsamples. More importantly, the reversal of the Christian advantage in favor of Muslim widows is found to be significant only for arguably poorer women—the uneducated and those with lower than average height in rural areas. There appears to be a nutritional cost to Christian widows whatever their socio-economic background. But for Muslims, it is the less well-off widows that appear to have better BMI than other women, all else held constant. For better-off women, the estimated coefficients generally move in the same direction but none of the differences are statistically significant.

The fact that we find our previous result among women who probably had lower margins of choice between remaining unmarried or not suggests that the gap reversal for widows is not simply driven by differential selection into widowhood. It would appear that poorer women, who are the most vulnerable following a widowhood shock are better protected by the socio-cultural-religious norms that kick in among Muslims. It should also be noted that in all the regressions reviewed, remarried, previously widowed Muslim women are no worse-off than their Christian

[32] Height here is assumed to be a proxy for well-being during childhood and arguably predetermined to widowhood.

counterparts. Indeed, the estimated coefficients are often positive and larger for them although they are never statistically different from those estimated for remarried Christian widows.

Third, as discussed, Christian women are on average better off than Muslim women in terms of nutritional and other outcomes (see Figure 1, Tables 1 and 2). If far fewer Christian women become widows at any given age, and it is only the very poorest that do, this might explain the larger differences between widowed and non-widowed women among Christians.[33] Relatedly, given the Muslim overall disadvantage, there could be selective mortality among the most nutritionally deprived Muslim widows such that only the better-off survive; Muslim widows whose relative disadvantage is similar to that of Christian widows become so weak that they do not survive and are thus not in our data.

These two possible concerns hinge upon the argument that Muslim women are worse off than Christian women in the full sample. To check the possibility of selection, we can exploit the fact that differences in nutritional status and other variables are much less pronounced in the subsample of mixed ethnic groups or villages in which women of both religions are found. This is shown in Figure 6 which plots BMI against age using nonparametric regressions as in Figure 1, but here only for women in the subsamples of mixed ethnic groups (panel a) and mixed religion villages (panel b). Consistent with the selection argument, our results should be absent or much weaker in these subsamples. Yet, in Table 6 we have shown instead that our main result — a nutritional disadvantage (in terms of BMI and underweight) of Christian widows that is offset among Muslim widows — is actually equal or larger than in the overall sample. This result suggests that selection is not driving the results. There is a further reason to question the idea that our results are due to selective mortality among Muslim widows. This seems improbable given that dying from low BMI is unlikely to be discontinuous and if the main way these women are dying is undernutrition, one might expect that those who are on the verge of perishing would still be in the sample and push the results in the opposite direction.

What we see in the data is consistent with Muslim widows being better protected by institutions but as we cannot fully resolve all the issues, we concede that it may not be the only explanation. While selection issues cannot be conclusively dismissed, these checks increase our confidence about our interpretation of the results.

[33] This argument draws on the finding that poorer women may be more vulnerable to widowhood given that they typically marry poorer and hence less healthy men (Sevak et al. 2003).

***Suggestive corroborative factors*:** Relative to other Christian women, widows have lower nutritional status. This is not found for widows among Muslim women. These patterns appear to reflect distinct cultural norms in which widows are treated very differently. Furthermore, the results suggest that those who are poor and most vulnerable to the downside consequences of a husband's loss are on average far better protected under Muslim socio-cultural-religious norms and processes.

The evidence in the DHSs on violence perpetrated by in-laws and reported suffered by widows is consistent with these findings. Table 8 shows that the least common form of violence is the request to carry out rituals as a proof of innocence. This is considerably more often experienced by Christian widows, at 7 and 14 percent in rural and urban areas respectively, compared to 1 and 2 percent for Muslim widows. The most frequent is maltreatment. Again, Muslim widows recount less than half the incidence of such brutality at 11 and 12 percent in rural and urban locations respectively, versus 23 and 27 percent reported by Christians. Remarkably, all forms of violence are more often endured by Christian widows whether in rural or urban areas. A caveat here is that since the majority of widowed Muslims remarry and given that information on violence by in-laws was only collected for current widows, we cannot conclusively say that violence is higher among Christian ever-widowed women.[34]

As noted earlier, differences also arise with respect to inheritance practices. Christian widows customarily have few rights to inherit a deceased husband's property. Often, they can retain the right to live in the matrimonial home only if they have a son. Inheritance rights are more established and protected under Islamic Law.

We explore what this means in practice using data from both DHSs that asked ever-widowed women to indicate who received most of their late husband's property. Table 9 shows the summary statistics separately for remarried and current widows by religious group and location. Christian ever-widows are much more likely to be dispossessed than their Muslim counterparts: 31 (27) percent of Muslim and 79 (42) percent of Christian remarried (current) widows did not receive any of their late husband's assets or valuables in rural areas. Another marked difference is that while the husband's family is the most likely recipient among Christian women (54 percent for remarried and 26 percent for currently widowed), the spouse's children are the most common for Muslim rural women (44 percent for remarried and 40 percent for

[34] Questions on violence were only asked in 2013 and cover 500 widows.

currently widowed). For dispossessed Muslim (Christian) women, the bulk of the property is inherited by the husband's family in 40 (56) and by the children in 36 (18) percent of cases. The literature supports the view that a widow's children inheriting is typically a favorable outcome for widows. This outcome is clearly more common for Muslim widows. Within each religious group, remarried widows are more likely to have been dispossessed than current widows, suggesting that inheritance outcomes matter to a women's agency and choices. These shares are of a similar magnitude in urban areas.

A few factors will cloud inter-group comparisons. Monogamous couples, more common among Nigerian Christians, and urban couples are more likely to own a house that can be inherited by a surviving spouse. Clearly wives of polygamous men need to share inheritance with co-wives and possibly brothers-in-law and their families. The descriptive statistics shown in Table 9 probably reflect differences in characteristics such as location, ethnicity, and education levels between the two religion groups. We estimated the probability of being dispossessed using a linear probability model in which the covariates are the ones included in the model presented in Table 3 with the exception of log wealth (as it encompasses data on asset ownership). We use the sample of ever-widowed women and estimate a pooled model with a dummy for being Muslim. The results confirm that there are large differences even after controlling for covariates: relative to their Christian counterparts, Muslim ever-widows are 19 (11) percentage points less likely to be dispossessed in urban and rural areas respectively (significant at the 1 and 10 percent levels).

6. Conclusions

The paper has examined the pronounced and significant gap in nutritional status favoring Christian over Muslim women in Nigeria. Using pooled DHS data for 2008 and 2013, we find that taking account of women's individual and household level characteristics eliminates the gap on average. Indeed, a decomposition analysis shows that the bulk of the disparity—90 percent in rural and 87 percent in urban areas—is attributable to differences in women's underlying attributes, rather than to different returns to those attributes associated with religion. Women's education, household wealth and demographics are among the most important contributory factors, along with ethnicity in rural, and state of residence, in urban Nigeria. Overall, Muslim women simply live in households and locations with worse endowments. Religion per se plays

little or no role once one controls for these other factors. In other words, religion only matters via these characteristics, notably women's education, household wealth and demographics.

This is encouraging as it suggests that development policies that successfully reduce poverty and promote human development can help reduce the nutritional disadvantages of Muslim women relative to Christian women. Consistent with this expectation, the paper documents improvements in nutritional status—measured by BMI and rates of underweight—for both groups between 2008 and 2013. Furthermore, the results indicate convergence in that progress disproportionately favored Muslim women. Thus, the nutritional gap significantly narrowed. The latter findings are particularly heartening with respect to underweight, indicating as they do that progress was concentrated on women at the lower end of the distribution.

Marital status is found to play a vital role in explaining cross-group differences in nutritional status. Remarkably, once covariates are taken into account, the direction of the gap reverses among widows. Widows exhibit a significant disadvantage relative to other women among Christians. In contrast, widows do rather better than other Muslim women and their fellow remarried widows do no worse.

These findings are robust to various checks, including controlling for village fixed effects and limiting the sample to villages where both groups reside on the one hand, and to ethnic groups that contain adherents of both religions on the other. We conclude that the revealed religious disparities for widows are not simply an artifact of unobservable factors related to ethnic social norms or localized geographic factors. Nor do the results appear to be the consequence of positive selection into current widowhood among ever-widowed Muslim women, whereby the needier among them remarry. Instead, further checks suggest that those most vulnerable to hardship at a husband's passing are on average far better protected under Muslim socio-cultural-religious norms and processes.

These findings echo a large Nigerian-based literature (largely outside economics) on the ill-treatment of widows. The literature also reports corroboration and potential cause in distinct cultural norms in which widows are treated differentially across the two religious institutions. We show that Christian widows report a higher incidence of cruelty and violence at the hands of in-laws and consistently inferior inheritance outcomes, including significantly higher rates of dispossession than do Muslim widows. The greater acceptability and ease of remarriage through the practice of polygamy also favors widowed Muslims. The revealed nutritional status

differentials among widows may or may not be influenced by such practices. At a minimum, they are undoubtedly a reflection of the same socio-cultural norms and processes that attend the shock of a husband's loss.

Despite the voluminous literature on the indignities and economic consequences of widowhood, our paper is one of the first to show suggestive evidence that such practices have impacts on physical wellbeing. Worldwide, unmarried individuals are more prone to death and morbidity and by extension, to poor nutritional status than their married counterparts. Recent research documents the presence of excessive deaths and undernutrition among widows in Africa. In this paper, we have argued that more favorable inheritance rules and social norms that more readily accept and encourage remarriage appear to considerably ease the shock of widowhood for Muslim relative to Christian women in Nigeria. The socio-cultural-religious norms and processes that follow widowhood for Muslim women clearly go some way to protect their health and well-being. This points to the important role that policy could play in protecting often young women—for example, through the enforcement of strict inheritance laws, cash transfer schemes and preferential access to housing, training, employment and schooling for their children—who have the great misfortune to experience the shock of widowhood.

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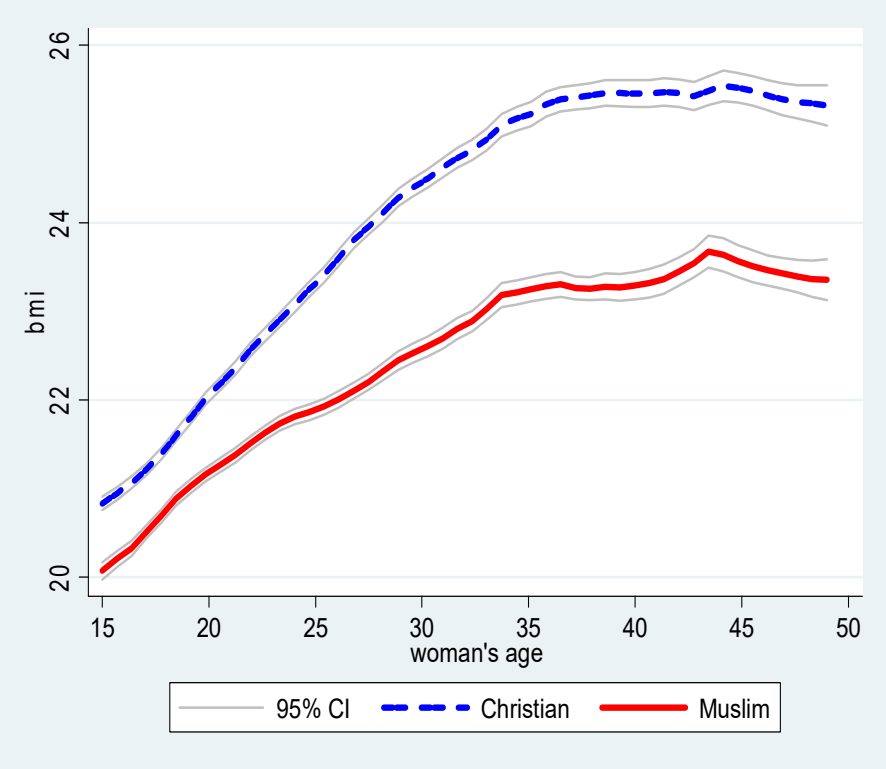
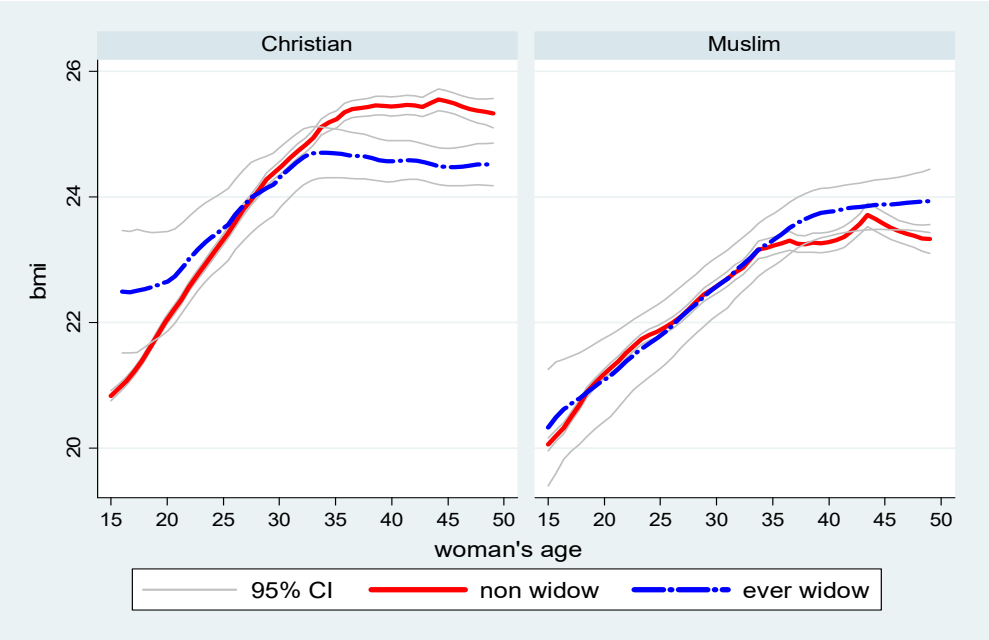
Figure 1: BMI by age and religion



Note: Based on kernel weighted local polynomial regressions.

Source: Nigeria DHSs of 2008 and 2013.

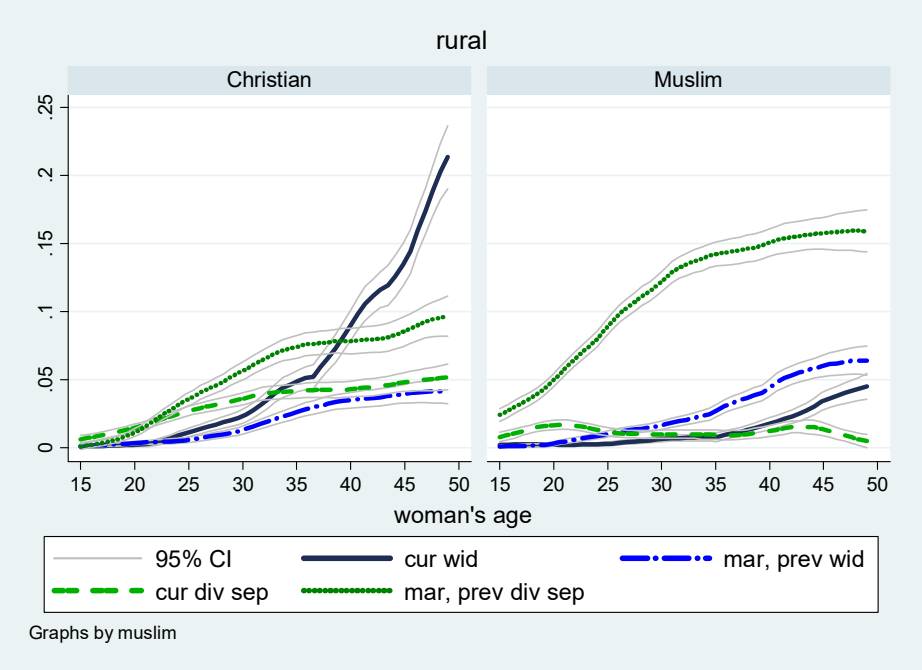
Figure 2: BMI by age and whether ever-widowed or not.



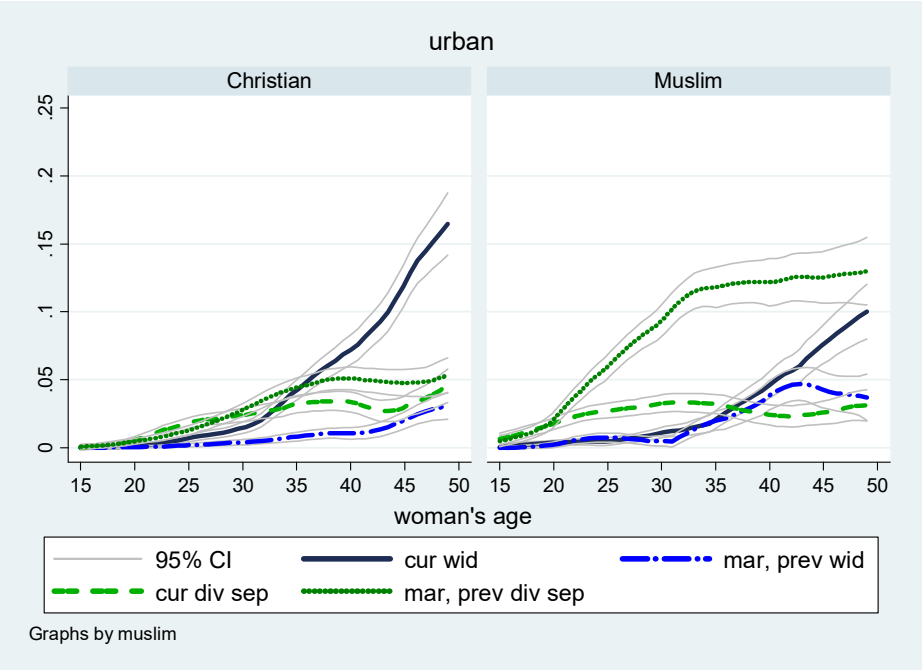
Note: Ever-widowed includes remarried previously widowed women and current widows. Based on kernel weighted local polynomial regressions.
Source: Nigeria DHSs of 2008 and 2013.

Figure 3: Distribution of women aged 15-49 by religion and marital status in Nigeria

a) Rural Nigeria



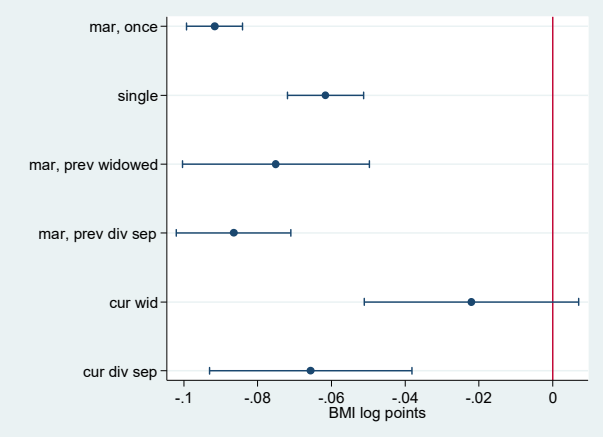
b) Urban Nigeria



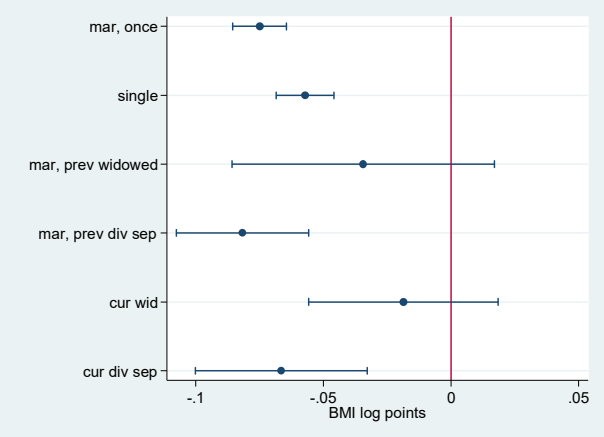
Note: The figures exclude single and married once women. Based on kernel weighted local polynomial regressions.
Source: Nigeria DHSs of 2008 and 2013.

Figure 4: Unconditional differences (Muslim – Christian) in average nutritional status, by marital status

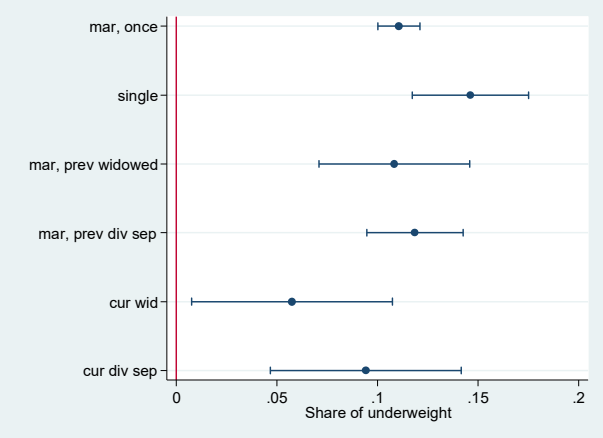
a) Rural log BMI



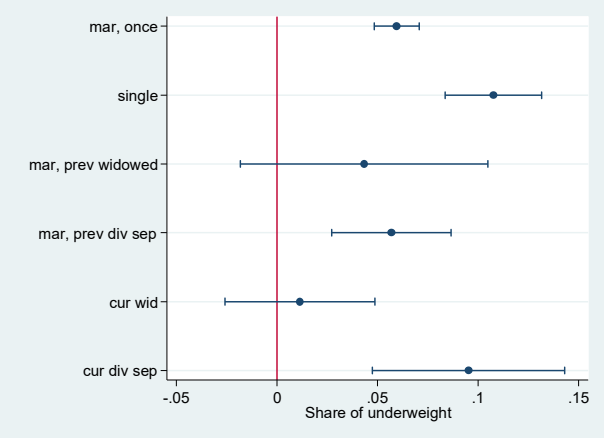
b) Urban log BMI



a) Rural share of underweight



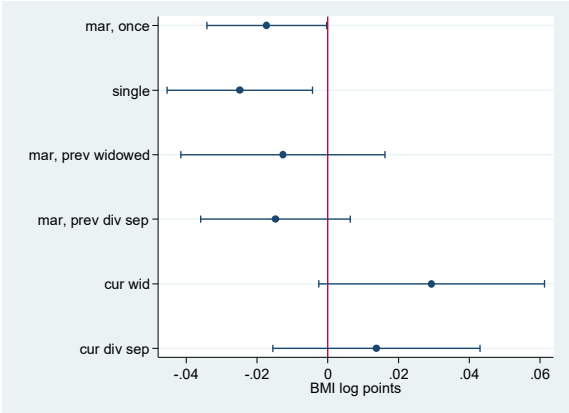
b) Urban share of underweight



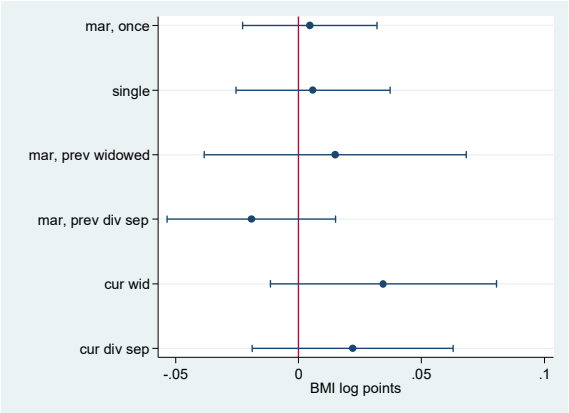
Note: The figure gives average predicted log BMI (upper panels) and underweight (bottom panels) differences between Muslims and Christians by marital status based on a regression of log BMI on a dummy variable for Muslim, dummies for marital status, and the interactions between Muslim and each marital status. These differences are evaluated at the sample mean of all the independent variables included in the regression. The zero line identifies no difference between Muslim and Christian women. 95% confidence intervals are shown around the difference in mean nutritional status for each marital status.
Source: Authors calculations using the Nigeria DHSs of 2008 and 2013.

Figure 5: Conditional predicted average differences (Muslim – Christian) in nutritional status, by marital status

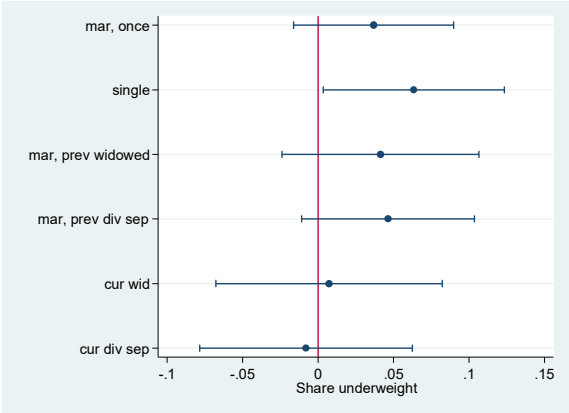
a) Rural log BMI



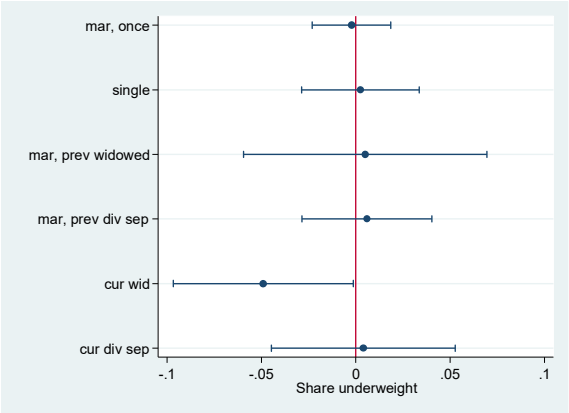
b) Urban log BMI



a) Rural share of underweight



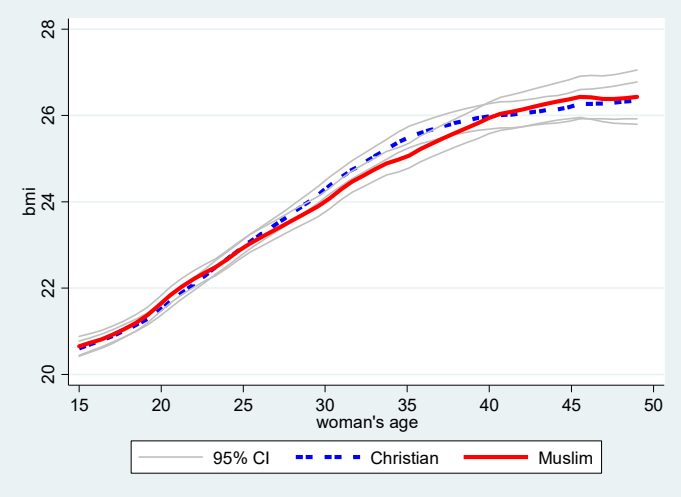
b) Urban share of underweight



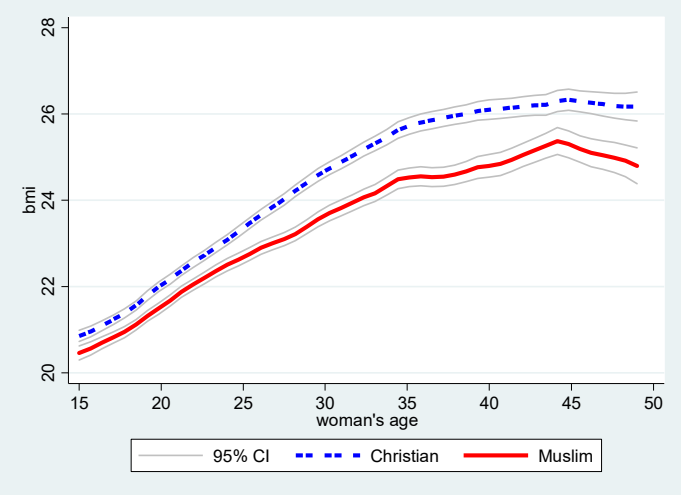
Note: The figure gives average predicted log BMI (upper panels) and underweight (bottom panels) differences between Muslims and Christians by marital status based on a regression of log BMI on a dummy variable for Muslim, the covariates (as in Table 3), and all the interactions between Muslim and the covariates. These differences are evaluated at the sample mean of all the independent variables included in the regression. The zero line identifies no difference between Muslim and Christian women. 95% confidence intervals are shown around the difference in mean nutritional status for each marital status.
Source: Authors calculations using the Nigeria DHSs of 2008 and 2013.

Figure 6: BMI by age and religion: subsamples of ethnicities and villages containing both religions

a) Subsample of mixed ethnic groups (Yoruba and Igala)



a) Subsample of mixed-religion villages



Source: Nigeria DHSs of 2008 and 2013.

Table 1: Summary statistics for women aged 15 – 49 by religion and urban rural residence

		RURAL			URBAN	
WOMAN'S CHARACTERISTICS	Total	Muslim	Christian	Total	Muslim	Christian
Age	28.74	28.79	28.69	28.75	28.43	28.96
	(9.60)	(9.55)	(9.67)	(9.41)	(9.49)	(9.36)
Years of education	4.33	1.57	7.76	8.94	6.39	10.57
	(4.94)	(3.39)	(4.38)	(4.93)	(5.33)	(3.86)
Single	0.19	0.07	0.33	0.33	0.23	0.39
	(0.39)	(0.26)	(0.47)	(0.47)	(0.42)	(0.49)
Married once	0.68	0.79	0.55	0.57	0.64	0.53
	(0.47)	(0.41)	(0.50)	(0.50)	(0.48)	(0.50)
Married, previous widow	0.02	0.02	0.02	0.01	0.01	0.01
	(0.13)	(0.14)	(0.12)	(0.09)	(0.11)	(0.08)
Married, previous divorcee	0.08	0.10	0.05	0.04	0.07	0.02
	(0.26)	(0.30)	(0.21)	(0.20)	(0.26)	(0.16)
Widow	0.02	0.01	0.04	0.03	0.02	0.03
	(0.15)	(0.10)	(0.20)	(0.16)	(0.14)	(0.17)
Divorcee	0.02	0.01	0.03	0.02	0.02	0.02
	(0.14)	(0.11)	(0.17)	(0.14)	(0.15)	(0.14)
Age at first marriage	16.82	15.53	19.01	19.68	17.61	21.35
	(4.19)	(3.21)	(4.73)	(5.04)	(4.17)	(5.06)
Pregnant	0.13	0.15	0.10	0.09	0.12	0.08
	(0.33)	(0.36)	(0.29)	(0.29)	(0.32)	(0.27)
Age husband	41.43	41.39	41.51	41.99	42.39	41.66
	(11.84)	(11.98)	(11.57)	(10.70)	(11.42)	(10.05)
Husband education years	4.78	2.63	8.41	9.32	7.62	10.69
	(5.46)	(4.59)	(4.87)	(5.45)	(6.06)	(4.45)
Polygynous husband	0.38	0.46	0.22	0.22	0.35	0.11
	(0.48)	(0.50)	(0.41)	(0.41)	(0.48)	(0.31)
Woman is the head	0.08	0.04	0.13	0.12	0.07	0.15
	(0.27)	(0.19)	(0.34)	(0.33)	(0.26)	(0.36)
Woman is the head's spouse	0.68	0.85	0.48	0.53	0.65	0.45
	(0.47)	(0.36)	(0.50)	(0.50)	(0.48)	(0.50)
Muslim	0.55	1.00	0.00	0.39	1.00	0.00
	(0.50)	(0.00)	(0.00)	(0.49)	(0.00)	(0.00)
Fulani	0.09	0.17	0.00	0.02	0.04	0.00
	(0.29)	(0.38)	(0.03)	(0.13)	(0.21)	(0.01)
Hausa	0.30	0.53	0.00	0.18	0.44	0.01
	(0.46)	(0.50)	(0.06)	(0.38)	(0.50)	(0.08)
Igbo	0.09	0.00	0.21	0.24	0.00	0.39
	(0.29)	(0.03)	(0.41)	(0.43)	(0.04)	(0.49)
Yoruba	0.08	0.06	0.10	0.29	0.31	0.27
	(0.27)	(0.24)	(0.30)	(0.45)	(0.46)	(0.44)
Igala	0.01	0.01	0.02	0.01	0.01	0.01
	(0.11)	(0.10)	(0.12)	(0.11)	(0.11)	(0.10)
HH CHARACTERISTICS						
Household size	6.54	7.07	5.87	5.96	7.21	5.16
	(3.58)	(3.82)	(3.13)	(3.71)	(4.69)	(2.61)
Dependency ratio	1.18	1.30	1.02	0.95	1.15	0.83
	(0.88)	(0.86)	(0.89)	(0.85)	(0.88)	(0.81)
Female-headed household	0.15	0.05	0.26	0.22	0.14	0.28
	(0.35)	(0.23)	(0.44)	(0.42)	(0.35)	(0.45)
Age of head	44.03	42.70	45.66	45.22	45.29	45.18
	(13.79)	(13.04)	(14.49)	(13.46)	(13.45)	(13.47)
Head's years of education	4.90	2.87	7.40	8.84	7.14	9.92
	(5.36)	(4.63)	(5.13)	(5.59)	(6.02)	(5.01)
Share 0-5, female	0.11	0.12	0.09	0.09	0.10	0.08
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Share 0-5, male	0.11	0.12	0.09	0.09	0.10	0.08
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)

Share 6-14, female	0.11	0.12	0.10	0.10	0.12	0.09
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Share 6-14, male	0.12	0.12	0.11	0.10	0.12	0.09
	(0.13)	(0.13)	(0.14)	(0.13)	(0.13)	(0.13)
Share 15-64, female	0.32	0.28	0.37	0.38	0.32	0.41
	(0.17)	(0.13)	(0.21)	(0.21)	(0.17)	(0.22)
Share 15-64, male	0.21	0.22	0.21	0.22	0.22	0.22
	(0.14)	(0.13)	(0.16)	(0.16)	(0.14)	(0.17)
Share 65 and older, female	0.01	0.00	0.01	0.01	0.01	0.01
	(0.05)	(0.03)	(0.06)	(0.05)	(0.04)	(0.06)
Share 65 and older, male	0.01	0.01	0.02	0.01	0.01	0.01
	(0.05)	(0.05)	(0.06)	(0.05)	(0.04)	(0.05)
DHS wealth index	9.55	9.22	9.95	10.83	10.57	11.01
	(0.81)	(0.65)	(0.81)	(0.86)	(0.84)	(0.83)
OUTCOMES						
BMI	22.25	21.62	23.04	23.90	23.21	24.34
	(4.06)	(3.93)	(4.09)	(4.95)	(4.88)	(4.94)
Share underweight	0.12	0.16	0.08	0.09	0.12	0.06
	(0.33)	(0.37)	(0.27)	(0.28)	(0.33)	(0.24)
Height	157.35	156.89	157.92	159.16	157.83	160.01
	(6.77)	(6.74)	(6.77)	(6.92)	(6.89)	(6.81)
Constraint: permission	0.15	0.20	0.08	0.08	0.11	0.06
	(0.35)	(0.40)	(0.28)	(0.27)	(0.32)	(0.24)
Constraint: money	0.56	0.54	0.59	0.37	0.33	0.39
	(0.50)	(0.50)	(0.49)	(0.48)	(0.47)	(0.49)

Note: Standard deviations in parentheses.
Source: Nigeria DHSs of 2008 and 2013.

Table 2: Summary statistics for women aged 15 – 49 by marital status, religion and urban rural residence

Rural	Married Once		Mar, Prev Widow		Widow		Mar Prev Divorcee		Divorcee	
	Muslim	Christian	Muslim	Christian	Muslim	Christian	Muslim	Christian	Muslim	Christian
Age	28.98	31.91	38.12	37.53	39.15	40.51	33.27	35.40	28.01	33.57
	(9.13)	(8.30)	(7.79)	(7.74)	(9.02)	(7.18)	(8.61)	(7.96)	(9.07)	(8.63)
Years of education	1.25	7.23	0.83	5.03	1.50	5.26	0.94	5.30	1.82	6.92
	(3.04)	(4.63)	(2.42)	(4.32)	(3.06)	(4.52)	(2.51)	(4.28)	(3.47)	(4.29)
Age at first marriage	15.61	19.19	15.00	17.43	16.03	18.39	14.94	17.93	15.53	18.99
	(3.19)	(4.68)	(3.26)	(4.44)	(4.35)	(4.79)	(3.19)	(4.90)	(3.02)	(4.99)
Husband education yrs	2.71	8.66	1.82	6.59	3.25	6.33	2.11	7.59	2.99	8.77
	(4.63)	(4.79)	(4.11)	(5.03)	(5.36)	(5.21)	(4.12)	(4.79)	(5.05)	(4.87)
Polygynous husband	0.43	0.19	0.69	0.53	.	.	0.65	0.45	.	.
	(0.50)	(0.39)	(0.46)	(0.50)	(.)	(.)	(0.48)	(0.50)	(.)	(.)
Married only once	1.00	1.00	0.00	0.00	0.84	0.91	0.00	0.00	0.77	0.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.36)	(0.28)	(0.00)	(0.00)	(0.42)	(0.36)
Household size	6.84	5.88	7.57	6.13	5.74	4.60	7.65	5.95	8.11	5.01
	(3.70)	(2.94)	(3.74)	(3.29)	(4.16)	(2.58)	(3.70)	(3.49)	(4.74)	(3.57)
Dependency ratio	1.33	1.21	1.34	1.21	1.40	1.09	1.36	1.20	1.19	1.03
	(0.86)	(0.91)	(0.88)	(0.97)	(1.34)	(1.07)	(0.83)	(0.93)	(0.82)	(1.04)
Female-headed HH	0.04	0.14	0.05	0.21	0.72	0.84	0.03	0.18	0.27	0.66
	(0.19)	(0.35)	(0.21)	(0.41)	(0.45)	(0.37)	(0.18)	(0.39)	(0.45)	(0.47)
Woman is the head	0.03	0.10	0.04	0.16	0.65	0.75	0.02	0.14	0.19	0.46
	(0.17)	(0.29)	(0.20)	(0.36)	(0.48)	(0.43)	(0.15)	(0.35)	(0.39)	(0.50)
BMI	21.68	23.75	22.13	23.65	23.09	23.52	21.86	23.63	22.12	23.73
	(3.88)	(4.22)	(4.39)	(4.13)	(4.72)	(4.36)	(4.12)	(4.19)	(5.04)	(4.30)
Underweight	0.15	0.05	0.14	0.04	0.12	0.07	0.17	0.06	0.15	0.05
	(0.36)	(0.22)	(0.35)	(0.19)	(0.33)	(0.25)	(0.37)	(0.25)	(0.36)	(0.22)
Height	157.05	158.41	157.63	157.98	158.58	158.00	157.29	158.29	157.43	158.36
	(6.67)	(6.50)	(6.75)	(7.23)	(6.72)	(6.97)	(6.31)	(6.66)	(6.56)	(6.66)
Constraint: permission	0.21	0.08	0.18	0.07	0.10	0.04	0.18	0.07	0.14	0.05
	(0.41)	(0.27)	(0.39)	(0.26)	(0.30)	(0.20)	(0.39)	(0.26)	(0.34)	(0.23)
Constraint: money	0.55	0.57	0.58	0.58	0.54	0.71	0.55	0.63	0.58	0.65
	(0.50)	(0.49)	(0.49)	(0.49)	(0.50)	(0.46)	(0.50)	(0.48)	(0.49)	(0.48)
Urban										
Age	30.72	33.30	38.29	39.68	40.19	40.81	34.26	36.12	30.75	34.59
	(8.53)	(7.67)	(7.61)	(7.49)	(7.75)	(6.60)	(7.99)	(7.37)	(8.40)	(8.03)
Years of education	5.70	10.40	3.21	6.80	4.46	8.00	3.89	8.04	5.39	9.80
	(5.45)	(4.23)	(4.61)	(4.65)	(5.42)	(4.91)	(4.57)	(4.23)	(5.44)	(4.26)
Age at first marriage	17.78	21.64	16.34	19.41	17.12	18.93	16.60	19.57	17.32	20.33
	(4.15)	(4.99)	(5.13)	(4.56)	(4.04)	(4.85)	(4.02)	(5.18)	(3.82)	(5.58)
Husband eduyrs	7.88	10.91	5.41	8.07	6.92	8.67	5.83	9.33	7.49	10.59
	(6.02)	(4.31)	(6.13)	(4.91)	(6.72)	(5.48)	(5.70)	(4.62)	(6.48)	(4.71)
Polygynous husband	0.31	0.09	0.67	0.46	.	.	0.62	0.37	.	.
	(0.46)	(0.29)	(0.47)	(0.50)	(.)	(.)	(0.49)	(0.48)	(.)	(.)
Married only once	1.00	1.00	0.00	0.00	0.88	0.93	0.00	0.00	0.79	0.87
	(0.00)	(0.00)	(0.00)	(0.00)	(0.33)	(0.26)	(0.00)	(0.00)	(0.41)	(0.34)
Household size	6.72	5.08	7.73	5.42	6.43	4.35	7.33	4.87	7.58	4.28
	(4.31)	(2.27)	(4.41)	(2.96)	(4.84)	(2.05)	(4.72)	(2.52)	(5.06)	(3.18)
Dependency ratio	1.27	1.06	1.12	1.02	1.05	0.98	1.28	1.09	0.92	0.79
	(0.89)	(0.86)	(0.80)	(0.81)	(1.18)	(0.98)	(1.06)	(0.97)	(0.87)	(0.88)
Female-headed HH	0.07	0.14	0.11	0.22	0.78	0.94	0.11	0.23	0.52	0.74
	(0.26)	(0.35)	(0.31)	(0.42)	(0.41)	(0.24)	(0.32)	(0.42)	(0.50)	(0.44)
Woman is the head	0.06	0.11	0.09	0.20	0.68	0.89	0.10	0.20	0.27	0.58
	(0.23)	(0.31)	(0.28)	(0.41)	(0.47)	(0.31)	(0.30)	(0.40)	(0.45)	(0.49)
BMI	23.83	25.62	24.99	25.65	25.01	25.99	24.14	26.25	23.57	25.83
	(4.89)	(5.06)	(5.82)	(5.04)	(4.94)	(5.60)	(4.91)	(5.65)	(5.12)	(5.30)
Underweight	0.09	0.03	0.09	0.04	0.06	0.04	0.08	0.03	0.13	0.04
	(0.28)	(0.17)	(0.28)	(0.20)	(0.24)	(0.19)	(0.27)	(0.16)	(0.34)	(0.19)
Height	158.51	160.59	159.24	160.75	160.07	160.41	158.73	159.42	158.10	160.46
	(6.41)	(6.72)	(6.55)	(6.11)	(6.83)	(6.52)	(6.36)	(6.46)	(7.31)	(6.59)
Constraint: permission	0.12	0.05	0.07	0.05	0.09	0.02	0.14	0.05	0.13	0.04
	(0.33)	(0.22)	(0.26)	(0.22)	(0.29)	(0.15)	(0.35)	(0.21)	(0.34)	(0.19)
Constraint: money	0.33	0.38	0.35	0.48	0.42	0.53	0.36	0.42	0.43	0.49
	(0.47)	(0.48)	(0.48)	(0.50)	(0.49)	(0.50)	(0.48)	(0.49)	(0.50)	(0.50)

Note: Standard deviations in parentheses.
Source: Nigeria DHSs 2008 and 2013.

Table 3: Determinants of nutritional status (log BMI) by religion, urban and rural

	(1) Rural pooled	(2) Rural Pooled	(3) Rural Muslim	(4) Rural Christian	(5) Urban pooled	(6) Urban pooled	(7) Urban Muslim	(8) Urban Christian
Muslim	-0.065***	-0.006			-0.046***	-0.006		
	(0.003)	(0.004)			(0.004)	(0.004)		
Single		-0.039***	-0.042***	-0.034***		-0.043***	-0.042***	-0.043***
		(0.004)	(0.008)	(0.005)		(0.005)	(0.011)	(0.006)
Mar, prev wid		-0.001	0.003	-0.002		0.011	0.015	0.004
		(0.006)	(0.007)	(0.009)		(0.012)	(0.016)	(0.018)
Mar, prev div		-0.002	0.000	-0.002		0.010*	0.002	0.026***
		(0.003)	(0.004)	(0.006)		(0.005)	(0.007)	(0.009)
Widow		-0.010	0.024*	-0.023***		-0.008	0.016	-0.014
		(0.006)	(0.013)	(0.007)		(0.009)	(0.017)	(0.010)
Divorcee		0.011	0.031***	0.000		-0.003	0.009	-0.008
		(0.007)	(0.012)	(0.008)		(0.009)	(0.015)	(0.012)
Age		0.011***	0.010***	0.012***		0.014***	0.012***	0.015***
		(0.001)	(0.001)	(0.001)		(0.001)	(0.002)	(0.001)
Age squared		-0.000***	-0.000***	-0.000***		-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Yrs education		0.003***	0.002***	0.004***		0.003***	0.002***	0.004***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.001)
Pregnant		0.049***	0.052***	0.044***		0.049***	0.051***	0.049***
		(0.002)	(0.003)	(0.004)		(0.004)	(0.006)	(0.006)
Household size		-0.000	0.000	-0.001		-0.000	-0.001	0.001
		(0.000)	(0.000)	(0.001)		(0.001)	(0.001)	(0.001)
Share 0-5 f		-0.048**	-0.030	-0.056**		0.008	0.006	-0.005
		(0.022)	(0.035)	(0.027)		(0.031)	(0.057)	(0.037)
Share 0-5 m		-0.051**	-0.026	-0.069**		0.020	0.029	0.001
		(0.022)	(0.035)	(0.028)		(0.031)	(0.057)	(0.037)
Share 6-14 f		-0.017	-0.003	-0.027		0.043	0.054	0.023
		(0.022)	(0.036)	(0.028)		(0.030)	(0.057)	(0.035)
Share 6-14 m		-0.039*	-0.024	-0.047*		0.046	0.064	0.025
		(0.022)	(0.035)	(0.028)		(0.031)	(0.055)	(0.037)
Share 15-64 f		-0.030	-0.023	-0.046*		0.049	0.075	0.026
		(0.022)	(0.034)	(0.028)		(0.031)	(0.057)	(0.036)
Share 15-64 m		-0.014	0.017	-0.038		0.025	0.041	0.003
		(0.020)	(0.032)	(0.025)		(0.028)	(0.054)	(0.033)
Share 65+ f		-0.029	0.021	-0.054*		0.018	0.017	0.015
		(0.026)	(0.047)	(0.031)		(0.031)	(0.062)	(0.035)
FHH		0.006	0.003	0.008*		0.003	-0.002	0.007
		(0.004)	(0.009)	(0.005)		(0.005)	(0.011)	(0.005)
Head		0.017***	0.033***	0.006		0.025***	0.048***	0.020**
		(0.005)	(0.010)	(0.006)		(0.007)	(0.014)	(0.008)
Spouse of head		0.011***	0.017***	0.006		0.021***	0.030***	0.022***
		(0.004)	(0.007)	(0.005)		(0.006)	(0.011)	(0.007)
Age of head		0.000	0.000	0.000		0.000	0.002	-0.000
		(0.000)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)
Age of head^2		-0.000	0.000	-0.000		0.000	-0.000	0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Edu yrs head		0.001***	0.001**	0.000		0.000	0.001**	-0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Log wealth		0.003***	0.003***	0.003***		0.004***	0.003***	0.005***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Fulani		-0.037***	-0.034***	0.006		-0.052***	-0.045***	-0.115***
		(0.007)	(0.008)	(0.028)		(0.011)	(0.012)	(0.037)
Hausa		-0.020***	-0.014**	-0.004		0.004	0.013*	-0.004
		(0.006)	(0.007)	(0.019)		(0.006)	(0.007)	(0.021)
Igbo		0.029***	0.001	0.014*		0.001	0.063	-0.000
		(0.008)	(0.036)	(0.008)		(0.005)	(0.059)	(0.006)

Yoruba		0.016**	0.042***	0.000		-0.020***	-0.011	-0.027***
		(0.007)	(0.011)	(0.007)		(0.005)	(0.011)	(0.006)
Igala		0.037**	0.024	0.043***		-0.000	0.018	-0.014
		(0.015)	(0.023)	(0.017)		(0.011)	(0.018)	(0.014)
Year 2013		0.020***	0.029***	0.009***		0.022***	0.026***	0.018***
		(0.003)	(0.004)	(0.003)		(0.003)	(0.005)	(0.004)
State F.E.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Constant	3.123***	2.157***	2.154***	2.162***	3.170***	1.780***	1.902***	1.703***
	(0.002)	(0.049)	(0.074)	(0.066)	(0.003)	(0.059)	(0.091)	(0.078)
Observations	42189	42189	22229	19960	24131	24131	9361	14770
R-squared	0.038	0.186	0.140	0.181	0.013	0.255	0.221	0.266

Note: Robust standard errors clustered at the village level. The share of male members aged 65 and over is the omitted household composition group.
Source: Authors' calculations using Nigeria DHSs of 2008 and 2013.

Table 4: Determinants of underweight by religion, urban and rural

	(1) Rural pooled	(2) Rural pooled	(3) Rural Muslim	(4) Rural Christian	(5) Urban pooled	(6) Urban pooled	(7) Urban Muslim	(8) Urban Christian
Muslim	0.093***	0.028***			0.055***	0.005		
	(0.005)	(0.007)			(0.005)	(0.006)		
Single		0.022***	0.061***	0.034***		0.038***	0.048***	0.043***
		(0.008)	(0.019)	(0.008)		(0.008)	(0.018)	(0.008)
Mar, prev wid		-0.006	-0.005	-0.009		-0.007	-0.002	-0.009
		(0.011)	(0.017)	(0.011)		(0.017)	(0.025)	(0.020)
Mar, prev div		0.017***	0.020**	0.010		-0.009	-0.005	-0.014
		(0.006)	(0.008)	(0.008)		(0.007)	(0.011)	(0.009)
Widow		0.009	-0.012	0.017		0.004	-0.032	0.014
		(0.011)	(0.026)	(0.011)		(0.010)	(0.022)	(0.010)
Divorcee		-0.013	-0.043*	0.002		0.019	0.018	0.012
		(0.011)	(0.025)	(0.011)		(0.012)	(0.022)	(0.014)
Age		-0.018***	-0.019***	-0.014***		-0.020***	-0.019***	-0.017***
		(0.001)	(0.002)	(0.002)		(0.002)	(0.003)	(0.002)
Age squared		0.000***	0.000***	0.000***		0.000***	0.000***	0.000***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Yrs education		-0.003***	-0.003***	-0.004***		-0.001**	-0.001	-0.003***
		(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)
Pregnant		-0.077***	-0.101***	-0.033***		-0.040***	-0.059***	-0.022***
		(0.004)	(0.006)	(0.005)		(0.005)	(0.009)	(0.005)
Household size		-0.001	-0.000	-0.001		0.001	0.002	-0.000
		(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)
Share 0-5 f		0.108***	0.065	0.138***		0.005	-0.081	0.051
		(0.041)	(0.075)	(0.046)		(0.053)	(0.115)	(0.059)
Share 0-5 m		0.106**	0.062	0.139***		-0.014	-0.116	0.043
		(0.041)	(0.076)	(0.046)		(0.052)	(0.114)	(0.058)
Share 6-14 f		0.121***	0.116	0.123***		0.014	-0.050	0.053
		(0.042)	(0.077)	(0.046)		(0.053)	(0.112)	(0.059)
Share 6-14 m		0.126***	0.114	0.128***		-0.012	-0.093	0.038
		(0.041)	(0.074)	(0.046)		(0.053)	(0.109)	(0.061)
Share 15-64 f		0.117***	0.101	0.131***		-0.023	-0.077	0.011
		(0.041)	(0.076)	(0.046)		(0.052)	(0.111)	(0.059)
Share 15-64 m		0.087**	0.045	0.109**		-0.018	-0.091	0.022
		(0.038)	(0.069)	(0.043)		(0.049)	(0.108)	(0.055)
Share 65+ f		0.180***	0.009	0.213***		0.000	-0.164	0.047
		(0.050)	(0.101)	(0.057)		(0.062)	(0.137)	(0.068)
FHH		-0.024***	-0.031	-0.014		-0.001	-0.008	0.006
		(0.009)	(0.023)	(0.009)		(0.010)	(0.023)	(0.010)
Head		0.006	-0.024	0.019*		-0.004	-0.044**	0.007
		(0.010)	(0.025)	(0.010)		(0.011)	(0.022)	(0.012)
Spouse of head		-0.019**	-0.043***	0.001		-0.001	-0.030	0.015
		(0.008)	(0.016)	(0.008)		(0.009)	(0.019)	(0.010)
Age of head		0.000	-0.001	0.002*		0.004***	0.003	0.004***
		(0.001)	(0.002)	(0.001)		(0.001)	(0.002)	(0.001)
Age of head^2		-0.000	0.000	-0.000		-0.000***	-0.000**	-0.000***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Edu yrs head		-0.000	-0.000	0.000		-0.001	-0.002***	0.001*
		(0.000)	(0.001)	(0.001)		(0.000)	(0.001)	(0.001)
Log wealth		-0.002***	-0.003***	-0.001***		-0.002***	-0.001***	-0.002***
		(0.000)	(0.001)	(0.000)		(0.000)	(0.000)	(0.000)
Fulani		0.086***	0.072***	0.079		0.075***	0.072***	-0.060**
		(0.014)	(0.015)	(0.105)		(0.019)	(0.021)	(0.025)
Hausa		0.034***	0.025**	-0.008		0.011	0.008	0.001
		(0.011)	(0.013)	(0.036)		(0.009)	(0.011)	(0.025)
Igbo		-0.020*	-0.016	-0.003		-0.010	-0.069***	-0.011*
		(0.011)	(0.067)	(0.010)		(0.006)	(0.025)	(0.007)
Yoruba		-0.011	-0.016	-0.012		0.024***	0.031**	0.021***

		(0.011)	(0.019)	(0.014)		(0.007)	(0.016)	(0.008)
Igala		-0.051***	-0.064***	-0.052*		-0.007	-0.037	0.012
		(0.018)	(0.022)	(0.027)		(0.016)	(0.024)	(0.023)
Year 2013		-0.020***	-0.047***	0.003		-0.008*	-0.023***	0.001
		(0.005)	(0.008)	(0.004)		(0.005)	(0.008)	(0.005)
State F.E.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Constant	0.075***	0.730***	1.136***	0.456***	0.067***	0.832***	0.862***	0.823***
	(0.002)	(0.084)	(0.146)	(0.091)	(0.003)	(0.089)	(0.161)	(0.106)
Observations	42189	42189	22229	19960	24131	24131	9361	14770
R-squared	0.020	0.067	0.060	0.043	0.009	0.076	0.076	0.070

Note: Robust standard errors clustered at the village level.
Source: Authors' calculations using Nigeria DHSs of 2008 and 2013.

Table 5: Blinder-Oaxaca decomposition of log BMI

	Rural		Urban	
		z-stat		z-stat
Christian	3.12292	1497.24	3.16963	1175.51
Muslim	3.05841	1170.62	3.12384	926.94
Total difference	0.06451	19.68	0.04579	11.23
Due to:				
Different characteristics	0.05817	13.6	0.04009	8.92
Different returns to characteristics	0.00634	1.57	0.00571	1.42
Different characteristics				
Single	-0.00976	-10.06	-0.00737	-7.32
Married, previous widow	0.00001	0.18	-0.00009	-0.87
Married, previous divorcee	0.00011	0.59	-0.00051	-1.88
Widow	-0.00031	-1.63	-0.00012	-0.99
Divorcee	0.00017	1.61	0.00001	0.31
Age	-0.00102	-2.69	0.00321	3.99
Years of education	0.02005	10.81	0.01454	8.59
Pregnant	-0.00258	-11.6	-0.00217	-7.69
Head	0.00157	3.25	0.00201	3.64
Spouse of head	-0.00386	-2.64	-0.00456	-3.48
Head's characteristics	0.00333	2.95	0.00113	1.33
HH demographic composition	0.00285	3.31	0.00324	3.08
Wealth	0.02116	12.5	0.01494	7.24
Location	0.00458	1.06	0.01333	4.04
Ethnicity	0.02289	5.54	0.00195	0.65
Year 2013	-0.00101	-1.72	0.00056	0.77
Different returns to characteristics				
Single	0.00178	1.28	-0.00021	-0.06
Married, previous widow	-0.00009	-0.45	-0.00010	-0.41
Married, previous divorcee	-0.00023	-0.54	0.00104	1.99
Widow	-0.00080	-3.27	-0.00062	-1.39
Divorcee	-0.00055	-2.23	-0.00040	-0.97
Age	0.05321	2.56	0.05253	1.65
Years of education	0.00704	2.9	0.01344	2.28
Pregnant	-0.00093	-1.68	-0.00027	-0.34
Head	-0.00193	-2.81	-0.00246	-1.65
Spouse of head	-0.00780	-1.32	-0.00585	-0.75
Head's characteristics	-0.01497	-0.8	-0.06189	-2.12
HH demographic composition	-0.03877	-0.95	-0.02709	-0.43
Wealth	0.06629	0.75	0.25935	2.54
Location	-0.04434	-2.55	-0.00836	-0.84
Ethnicity	-0.00886	-3.33	-0.00924	-1.86
Year 2013	-0.01035	-3.92	-0.00490	-1.38
Constant	0.00764	0.08	-0.19926	-1.69
N	42189		24131	

Note: Age includes age and age squared; location refers to state fixed effects; head's characteristics include: age and age squared, and years of schooling. The Wealth index is logged. Ethnicity includes: Fulani, Hausa, Igbo, Yoruba and Igala. Household demographic structure includes: head is female, household size and composition.
Source: Authors' calculations using Nigeria DHSs of 2008 and 2013.

Table 6: Robustness checks: estimated marital status coefficients in log BMI regressions

Dep. var.:	BMI				Underweight			
	Subsample of mixed religion Yoruba & Igala ethnic groups		Subsample of villages with variation by religion		Subsample of mixed religion Yoruba & Igala ethnic groups		Subsample of villages with variation by religion	
	rural	urban	rural	urban	rural	urban	rural	urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Muslim	0.021	0.004	0.003	0.012	-0.024	-0.018	0.014	-0.024*
	(0.014)	(0.012)	(0.007)	(0.010)	(0.022)	(0.016)	(0.014)	(0.013)
Single	-0.037**	-0.042***	-0.043***	-0.031***	0.004	0.019	0.042***	0.043***
	(0.016)	(0.014)	(0.009)	(0.009)	(0.023)	(0.019)	(0.014)	(0.012)
Married, previous widow	0.019	0.046	0.023	0.018	-0.034**	-0.032	-0.017	-0.047**
	(0.036)	(0.036)	(0.016)	(0.022)	(0.014)	(0.030)	(0.014)	(0.019)
Married, previous divorcee	-0.010	0.038***	-0.000	0.037***	0.017	-0.033**	0.018	-0.034***
	(0.018)	(0.014)	(0.009)	(0.013)	(0.027)	(0.014)	(0.015)	(0.011)
Current widow	-0.044*	0.010	-0.023	0.001	0.080*	-0.008	0.044**	0.008
	(0.024)	(0.022)	(0.014)	(0.016)	(0.042)	(0.022)	(0.021)	(0.015)
Current divorcee	0.018	0.012	0.009	0.000	0.002	-0.002	0.004	0.037*
	(0.032)	(0.023)	(0.014)	(0.017)	(0.040)	(0.026)	(0.018)	(0.021)
Muslim*Single	-0.036	0.022	-0.009	-0.006	0.033	0.011	0.003	0.004
	(0.031)	(0.023)	(0.015)	(0.015)	(0.053)	(0.035)	(0.031)	(0.025)
Muslim*Married, previous widow	-0.060	0.004	-0.017	0.014	0.100	0.045	0.050	0.046
	(0.065)	(0.049)	(0.023)	(0.033)	(0.070)	(0.053)	(0.033)	(0.037)
Muslim*Married, previous divorcee	0.025	-0.031	0.009	-0.023	-0.023	0.033	-0.016	0.006
	(0.027)	(0.019)	(0.012)	(0.016)	(0.042)	(0.027)	(0.022)	(0.018)
Muslim*Current widow	0.064*	-0.004	0.050**	0.020	-0.090*	0.026	-0.091***	-0.043
	(0.036)	(0.038)	(0.025)	(0.028)	(0.054)	(0.040)	(0.035)	(0.029)
Muslim*Current divorcee	-0.134***	0.031	-0.001	0.008	0.049	-0.033	0.005	-0.043
	(0.047)	(0.037)	(0.026)	(0.026)	(0.085)	(0.034)	(0.041)	(0.035)
Constant	1.904***	1.771***	2.162***	1.794***	0.773***	1.211***	0.758***	0.670***
	(0.191)	(0.167)	(0.136)	(0.137)	(0.293)	(0.260)	(0.219)	(0.230)
Covariates as in Table 3	yes	yes	yes	yes	yes	yes	yes	yes
Fixed effects	state	state	village	village	state	state	village	village
Observations	3715	7021	12701	13343	3715	7021	12701	13343
R-squared	0.226	0.278	0.281	0.316	0.079	0.084	0.145	0.139

Note: Robust standard errors clustered at the village level. Interactions between the Muslim dummy and all the other covariates and fixed effects are included (not shown). The coefficient for 'Muslim' is the conditional marginal effect for married once women (dy/dmuslim | married once =1) evaluated at average values of the covariates in the sample (using the STATA margins command); standard errors for 'Muslim' are computed using the Delta method.
Source: Authors' calculations using Nigeria DHSs of 2008 and 2013.

Table 7: Estimated marital status coefficients in log BMI regressions by religion for subsample of women aged 40-49

	(1) Rural Educ = 0	(2) Rural Educ > 0	(3) Urban Educ = 0	(4) Urban Educ > 0	(5) Rural Height <average	(6) Rural Height >= average	(7) Urban Height < average	(8) Urban Height >= average
Muslim	-0.002	0.042*	0.034	0.014	-0.021	0.006	0.011	-0.003
	(0.020)	(0.024)	(0.033)	(0.020)	(0.025)	(0.017)	(0.027)	(0.019)
Single	-0.047	-0.068**	--	--	-0.067*	-0.061	--	--
	(0.071)	(0.030)			(0.037)	(0.045)		
Mar, prev widow	-0.012	-0.003	0.038	-0.034	0.014	-0.034	-0.036	0.007
	(0.024)	(0.017)	(0.070)	(0.026)	(0.017)	(0.022)	(0.034)	(0.036)
Mar, prev divorcee	-0.006	0.015	0.040	0.041**	0.010	0.003	0.029	0.052**
	(0.016)	(0.012)	(0.043)	(0.018)	(0.013)	(0.015)	(0.028)	(0.024)
Widow	-0.039**	-0.037***	-0.042	-0.035**	-0.060***	-0.008	-0.041*	-0.037*
	(0.018)	(0.013)	(0.032)	(0.017)	(0.014)	(0.017)	(0.022)	(0.021)
Divorcee	-0.021	-0.016	-0.057	-0.029	-0.013	-0.032	-0.043	-0.031
	(0.028)	(0.018)	(0.057)	(0.024)	(0.023)	(0.021)	(0.028)	(0.032)
Muslim*single	0.066	-0.008	--	--	0.144*	0.071	--	--
	(0.098)	(0.065)			(0.081)	(0.064)		
Muslim*married, previous widow	0.026	0.014	-0.023	0.045	-0.012	0.070**	0.031	0.009
	(0.027)	(0.047)	(0.076)	(0.046)	(0.022)	(0.029)	(0.048)	(0.049)
Muslim*married, prev. divorcee	0.013	0.006	-0.036	-0.052*	0.003	0.003	-0.038	-0.043
	(0.018)	(0.025)	(0.046)	(0.029)	(0.017)	(0.019)	(0.036)	(0.031)
Muslim*widow	0.068**	0.043	-0.004	0.009	0.098***	0.011	0.037	-0.007
	(0.029)	(0.046)	(0.046)	(0.049)	(0.031)	(0.034)	(0.042)	(0.042)
Muslim*divorcee	0.049	-0.046	0.038	-0.010	0.061*	0.011	0.021	0.038
	(0.040)	(0.063)	(0.077)	(0.051)	(0.037)	(0.044)	(0.052)	(0.063)
Constant	0.143	1.490*	0.283	-0.079	1.478*	-0.224	-0.480	0.485
	(1.152)	(0.870)	(2.050)	(0.997)	(0.891)	(1.096)	(1.504)	(1.264)
Covariates	yes	yes	yes	yes	yes	yes	yes	yes
Fixed effects	state	state	state	state	state	state	state	state
Observations	4695	3125	1254	2847	4202	3618	1806	2295
R-squared	0.102	0.155	0.182	0.147	0.164	0.213	0.241	0.191

Note: Robust standard errors clustered at the village level. 159.26 cm is the mean height for women aged 40 and older. Educ refers to completed years of schooling. Interactions between the Muslim dummy and all the other covariates and fixed effects are included (but not shown). The coefficient for 'Muslim' is the conditional marginal effect for married once women (dy/dmuslim | married once =1) evaluated at average values of the covariates in the sample (using the STATA margins command); standard errors for 'Muslim' are computed using the Delta method. Source: Authors' calculations using Nigeria DHSs of 2008 and 2013.

Table 8: Violence and maltreatment of widows by her late husband's relatives

	Rural		Urban	
	Muslim	Christian	Muslim	Christian
Blamed for death	0.09	0.10	0.00	0.15
	(0.04)	(0.02)	(0.00)	(0.03)
Physically abused	0.07	0.19	0.13	0.20
	(0.03)	(0.03)	(0.05)	(0.03)
Maltreated	0.11	0.23	0.12	0.27
	(0.04)	(0.03)	(0.05)	(0.03)
Her children are maltreated	0.07	0.17	0.03	0.20
	(0.03)	(0.03)	(0.03)	(0.03)
Must prove her innocence	0.01	0.07	0.02	0.14
	(0.02)	(0.02)	(0.02)	(0.02)

Note: Asked only in DHS 2013. About 500 current widows answer these questions (rural: 58 Muslims, 212 Christians; urban: 40 Muslims, 192 Christians). Standard errors of the mean in parentheses.
Source: Nigeria DHSs of 2008 and 2013.

Table 9: Beneficiaries of late husband's property among ever-widows

	Remarried widows				Current widows			
	Rural		Urban		Rural		Urban	
	Christian	Muslim	Christian	Muslim	Christian	Muslim	Christian	Muslim
Widow respondent	0.11	0.21	0.10	0.16	0.42	0.26	0.41	0.40
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)
Other wife	0.05	0.03	0.01	0.02	0.03	0.04	0.03	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Late husband's children	0.18	0.44	0.10	0.40	0.18	0.40	0.17	0.35
	(0.02)	(0.02)	(0.03)	(0.04)	(0.01)	(0.04)	(0.02)	(0.04)
Late husband's family	0.54	0.24	0.56	0.28	0.26	0.18	0.26	0.12
	(0.03)	(0.02)	(0.05)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)
Other	0.04	0.03	0.10	0.04	0.03	0.07	0.02	0.03
	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
No property	0.09	0.05	0.13	0.09	0.07	0.05	0.12	0.09
	(0.02)	(0.01)	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
Widow dispossessed	0.79	0.31	0.73	0.39	0.42	0.27	0.43	0.23
	(0.02)	(0.02)	(0.05)	(0.04)	(0.02)	(0.03)	(0.02)	(0.04)
N	295	469	93	137	752	197	468	136

Note: The table records the answers by ever-widowed women to the question: 'to whom did most of your late husband's property go?' Standard errors of the mean are given in parentheses.
Source: Nigeria DHSs of 2008 and 2013.