WOMEN'S DECISION-MAKING AUTONOMY AND UNDER-FIVE MORTALITY IN RURAL MOZAMBIQUE

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1. Introduction

Studies focusing on investments in children in less developed countries have demonstrated the importance of women's status as a determinant of child's outcomes (e.g. Haddad, Hoddinott, and Alderman 1997; Quisumbing 2003; Shroff et al. 2009). Moreover, previous research has included women's status as a relevant factor in explaining health inequalities among young children (Desai and Alva 1998; Kishor 2000, Smith et al. 2003, Basu and Koolwal 2005, Shroff et al. 2009). Women's lower status is associated with less control over resources, lower decision-making power in the household and children's affairs; less access to health services, more mobility and time constrains (Smith et al. 2003). These factors have been shown to be related to women's ability to provide care for their children, as well as to demand health services for them.

In a setting with important gender imbalances and poor health outcomes like Mozambique, it is relevant to better understand how maternal status can help improving children's chances of surviving. Under-five mortality rate dropped from 226 per thousand in 1990 to 135 per thousand in 2010 (Unicef 2013). Despite the recent progress, Mozambique still figures among the countries with poorest child health indicators according to the Unicef (2013).

Although several dimensions of women's status have been shown in the literature to be associated with child's health, this study contributes to this literature by focusing specifically on the effect of women's decision-making autonomy on under-five mortality. Using survey data from 2006 and 2009 for children between 0

and 5 years old, this study analyzes how women's self-reported decision-making power affects children's survival chances. Another contribution of this study is to assess whether these associations vary by sex of the child. Preliminary results show a negative and significant impact of decision-making autonomy on under-five mortality, net of other characteristics related to women's status. When the analysis is conducted by sex of the child, the effect of mother's decision-making autonomy holds only for sons, and it is not significant for daughters.   The full paper will investigate possible pathways for the association of women's autonomy and child survival in this context, characterized by high HIV prevalence and intense male migration.

2. Background

The relevance of women's status for children's health has been well discussed in the literature. Studies have demonstrated that higher women's status is correlated with child's better nutrition (Smith et al. 2003; Frost, Forste, and Haas 2005; Guha-Khasnobis and Hazarika 2006; Ackerson and Subramanian 2008), higher levels of immunization (Desai and Alva 1998; Basu and Koolwal 2005), and lower child mortality (Mason 1984, Caldwell 1986, Basu and Koolwal 2005).

For the study of child mortality specifically, Das Gupta (1990) argues that analyzing the association of women's status and child mortality is an important addition to the framework proposed by Mosley and Chen (1984) to the study of child survival. Mosley and Chen's framework integrates the medical and social approaches to the study of child mortality. They identify five groups of proximate determinants of child's health: factors related to the mother (age, parity, birth interval), environmental contamination, deficient nutrition, injury, and personal illness control (Mosley and Chen 1984). These proximate determinants are subject to the influence of socioeconomic and contextual characteristics, such as household wealth and

individual productivity (education and occupation). According to Das Gupta (1990), the framework implies that socioeconomic characteristics would be responsible for explaining mortality differences across households within the same community because these households would have the same community-level conditions and would be influenced by the same culture. However, the author shows that after controlling for the proximate determinants proposed by Mosley and Chen, and for households' and individuals' socioeconomic characteristics, there is a clustering of deaths within households that is significantly associated with mother's educational level and autonomy (Das Gupta 1990).

Because women's status is a complex and multidimensional concept, empirical work on its effects on child's health outcomes has taken various approaches depending on the aspect of status being analyzed. Thus, the seminal work by Caldwell (1979) on Nigeria brought attention to the importance of mother's education for the survival of children. According to Caldwell (1979), maternal education increases mother's ability to interact with modern world, including interaction with medical personnel. Moreover, mother's education shifts the power structure of the family, giving educated women greater control over decisions regarding their children (Caldwell 1979). Since Caldwell (1979)'s work, a considerable body of research has demonstrated the relevance of mother's education to child mortality. Studies have shown that more educated mothers would have better practices in child feeding and care, as well as a number of skills related to health, socioeconomic aspirations, and interpersonal behaviors that could affect child's survival chances (LeVine et al. 1994, Frost, Forste, and Haas 2005).

However, as shown by Desai and Alva (1998), the relationship between mother's education and child's health is context-dependent and is frequently

attenuated by household socioeconomic status and community characteristics. For instance, the effect of mother's education can be hard to capture in settings with very low levels of formal schooling and little variability of educational level, as discussed by Jani et al. (2008). In fact, Hobcraft (1993) shows that the effect of maternal education on child mortality is the weakest in Sub-Saharan Africa, compared with the Americas, Asia and North Africa. He argues that the weaker effect of maternal education on child mortality may be due to several factors, such as the lower penetration of formal education in sub-Saharan countries; the poorer health infrastructure, which inhibits educated mother's ability to take advantage of their human capital; and poorer data quality (Hobcraft 1993).

Studies that examine child's health outcomes and women's status frequently use proxy measures of status instead of its determinants (education, employment, socioeconomic status). Freedom of movement has been shown to be related to higher levels of use of health services (Bloom, Wypij, and Das Gupta 2001, Shroff et al. 2009). Studies looking at women's control over household resources suggest that women's control over assets is important for household food security and consequently for child's health because they are more likely to invest in healthcare and nutrition (Roushdy 2004; Amin and Li 2008, Shroff et al. 2009).

The literature on the role of women's autonomy for child outcomes has often argued that investments in children depend on intra-household resource allocation, which could be affected by gender inequalities in the household. Discussion about how this decision-making process is made within the household dates back to Becker (1965, 1981)'s "new home economics" model. The model considers the household as a monolithic unit, in which members pool their time and resources in order to maximize the collective benefit instead of their individual gains. In contrast to this

view, a number of studies have provided evidence supporting theories of bargaining, or "co-operative conflict" (Schultz 1990; Thomas 1990; Duraisamy and Malathy 1991; Bruce, Lloyd, and Leonard 1995; Hoddinott and Haddad 1995). Thus, the decision-making process within the household would depend on individuals' bargaining power. Studies have shown that in families in which women have higher decision-making power the proportion of resources devoted to children is greater than in families where women do not play an important role in the decision-making process (Duraisamy and Malathy 1991; Handa 1996).

According to Eswaran (2002), the difference in the optimal allocation of resources regarding children for mothers and fathers is due to the fact that women have to bear most of the costs associated with childrearing. They suffer a considerable income loss during pregnancy, childbirth and childrearing because they might become unavailable for work. Moreover, they incur in health risks during childbearing, especially in developing countries. In this sense, the benefits of having children are equally shared by the couple, but the costs related to it are disproportionately borne by women. As Eswaran (2002) argues, because of the difference in the cost and benefits of having children between men and women, men would be more inclined to have more children because of the negligible share of costs in bearing children and small costs of raising them. In contrast, women, anticipating the risk of child mortality would try to invest more in healthcare and other aspects related to improving the survival chances of the children already born. Therefore, an increase in women's decision-making autonomy should reduce child mortality.

Moreover, as pointed out by Desai and Johnson (2005), women's decision-making power is related to child's health in ways other than resource allocation. According to the authors, health-enhancing behaviors such as better hygiene,

treatment procedures, feeding practices and routine vaccination depend on decisions on time allocation (Desai and Johnson 2005). Women with higher decision-making autonomy may be better able to determine if the child is being given a proper diet, as well as have easier access to health care without having to ask for permission of the husband or mother-in-law. Hence, they are able to address the child's needs more efficiently (Desai and Johnson 2005). The authors analyzed the association between women's decision-making autonomy and several children's health outcomes in 12 different countries, and found that mother's higher decision-making power is related to lower levels of child mortality. Moreover, child mortality was found to be negatively affected by mother's ability to access health services (Desai and Johnson 2005).

Apart from using direct indicators of women's decision-making autonomy, studies have also looked at characteristics that depict source of power within marriage, such as customs regarding marriage and partner's characteristics. Adato, Mindek, and Quisumbing (2000) find that characteristics of husbands and wives are the most important predictors for decision-making patterns in six communities in Mexico. Besides the effect of extra-household structures and gender beliefs, bargaining power within the household would be highly related to the human and physical capital each one brings to the marriage (Adato, Mindek, and Quisumbing 2000). Wives have higher decision-making power when there is a small age and educational difference between spouses (Adato, Mindek, and Quisumbing 2000). Kishor (2000) findings on women's empowerment and child's health in Egypt suggest that small age difference between partners were associated with higher chances of survival for children.

Living arrangements characteristics such as co-residence with in-laws and type of relationship (cohabitation, marriage, casual) have an effect on the marriage's balance of power (Blanc 2001). The practices of patrilineal and patrilocal residence, in which a son remains at his father's residence after marriage but a married daughter moves into her husband's family household, may reduce women's decision-making ability because marital kin have authority over family decisions (Warner, Lee, and Lee 1986, Balk, 1997, Yount 2005). On the other hand, patrilineal marriage systems could enhance marriage stability because it transfers her reproductive power to her husband's family through payment of bridewealth (Gaje-Brandon 1993, Arnaldo 2004). In such systems, divorce is more difficult because bridewealth has to be returned in case of separation. Ogbu (1978) argues that bridewealth is a form of legitimation of marriage in some African societies, and it is a practice that would enhance rather than diminishes the status of women in that context.

The degree of marital commitment could affect women's decision-making power, and consequently affect child's health. In their work using Brazilian data, Rao and Greene (1991) argue that women rarely opt for a consensual union, but stay in less stable arrangements because their partners will not agree to a legal marriage. Desai (1992)'s study on child's health and family structure in Latin America and West Africa shows evidence of the negative relationship between union instability and child's health. According to the study, children living in consensual unions, outside of unions, and in polygynous marriages are more likely to have poorer health than children in formal unions (Desai, 1992).

Recent research on women's autonomy and child's outcomes has given attention to the effect of women's decision-making autonomy on investments in children (e.g., Durrant and Sathar 2000, Shroff et al. 2011). In this case, women's

decision-making autonomy is conceptualized as an independent dimension of women's status. The decision-making autonomy measure would capture aspects of women's status that are not represented in the conventional measures usually included in studies of women's status, such as education, employment, marriage and partner's characteristics. In this sense, Kabeer (2002) argues that the ability to make choices and act upon them should be viewed as separate from personal resources and outcomes when analyzing women's empowerment. The analysis conducted in this study will test for the relevance of women's decision-making autonomy as a distinct dimension of women's status in affecting children's survival chances.

Finally, there is no consensus in the literature regarding the existence and the direction of gender bias in the effect of different dimensions of women's status on child mortality. It has been suggested that higher female literacy have a greater effect on daughters' survival, relative to sons' (Bourne and Walker 1991). Moreover, Rosenzweig and Schultz (1982) examined the relationship between employment opportunities for adult women and child survival and found that improved employment for mothers tended to raise daughters chances of survival. Similarly, Kishor (1993) finds that higher female labor participation is negatively correlated with female disadvantage in child survival. The author also shows that daughters' mortality is lower where the incidence of patrilocal exogamy is lower (Kishor 1993). As discussed by Murthi et al. (1995), the mechanisms underlying the relationship between women's improved status and higher daughters' survival are unclear. They argue that improved status can: (1) raise the perceived future returns of investments on girls; (2) lower the value of bridewealth and lower women's dependence on adult sons at older ages, if the higher status is related to higher participation in the labor

market; (3) raise women's bargaining power and their ability to resist male pressure to discriminate in favor of sons (Murthi et al. 1995).

At the same time, there is evidence that increased status of women can influence gender bias in the opposite direction. Thus Das Gupta (1990) argues that educated mothers may become more effective in discriminating against their female children. The author finds that relative excess of mortality of second and higher-order daughters was higher for more educated women (Das Gupta 1990). Eswaran (2002) argues that in societies where old age security is provided mainly by sons, and rarely by daughters, female children are discriminated against in term of health care expenditures. According to him, unless female autonomy extends beyond the household and enables daughters to support their parents at old ages, greater maternal autonomy only increases the gap in household expenditures in favor of sons (Eswaran 2002).

3. Hypotheses

Based on previous research on the effect of women's status and children's health outcomes, and on the conceptualization of decision-making autonomy as an independent dimension of women's status, this study examines the following hypotheses on the association of women's decision-making autonomy and under-five mortality.

H1. Women's decision-making autonomy will be related to higher chances of survival for the child (because mother's higher autonomy may lead to higher investments in children, higher mobility and use of health services).

H2. Women's decision-making autonomy will have an independent association with children's chances of survival and will not mediate the effect of

traditional measures of women's status, such as women's education, employment, and marriage characteristics.

With respect to gender differences in the effect of mother's autonomy, to alternative hypotheses are tested:

H3. Women's decision-making autonomy will have a positive impact on sons' survival chances (because in a patrilineal and patrilocal context, mothers may perceive investments made in sons' health as having higher returns in the future).

H4. Women's decision-making autonomy will have a positive impact on daughters' survival chances (because daughters living in an environment of higher female autonomy and gender equity may be seen as more valuable. They may be positively affected by their mothers' greater decision-making power by receiving more care and resources than daughters living in a context of lower female autonomy).

a. Data and Methods

Data

The data for the present study come from a representative survey of ever-married women of reproductive age conducted in July 2006 and July 2009 in rural areas of four contiguous districts (total area 5900 square miles, population 625,000) of Gaza province in southern Mozambique.

The sample includes women from 56 villages in 14 districts. In 2006, in each village all households with at least one married woman were selected and divided into two groups—those with at least one woman married to a migrant and those with no such women. These two groups were used as separate sampling frames: from each of them 15 households were randomly selected. In each selected household a woman was interviewed (in households classified as migrant, a woman married to a migrant

was interviewed). The resulting sample consisted of 1680 women, with approximately the same number of women married to migrants and women married to non-migrants. In 2009, a second wave of data collection was carried out among women still living within the study area (N=1314, 78% of the 2006 sample). A refresher sample was randomly selected to replace women lost to follow up and the final sample in 2009 was formed by 1772. In this study, the analytical sample is restricted to women who were present in 2006 and 2009, since I make use of information in both years. The total sample is constituted of 1916 children, 939 girls, and 977 boys.

In both years, the survey collected detailed demographic and socioeconomic information, including pregnancy histories, husband's characteristics, marriage characteristics, household material status, and household composition. The questionnaire also contains a number of questions measuring women's decision-making power.

Dependent variable

The dependent variable is under-five mortality between the two survey waves (2006 and 2009), more specifically, the duration before child's death or censoring. In the person-year file, for each year of exposure to the risk of death, the child was given one observation in the dataset, so that one child can have a maximum of 4 observations. For each observation, the duration of time before death was coded as 0 if the child survived that year, and 1 if the child died. After the event of death, the child stops contributing with person-years and is censored from the sample. Children who survive the entire period being analyzed contribute with persons-year observations to the dataset until the last year, 2009.

Independent variables

Decision-making autonomy

The main independent variable in this analysis is mother's decision-making autonomy. Women's autonomy is a multidimensional concept and simplifications must be made in order to generate a synthetic measure. For the purpose of this analysis, the index is restricted to aspects related to decision-making autonomy. The decision-making autonomy indicator is a modified version of the scale developed by Yabiku, Agadjanian, and Sevoyan (2010). It is constructed using questions on women's autonomy to perform seven activities, with responses following a 3-point Likert scale. For each of those activities, women were asked if they (i) would need to ask their husband's or his relatives' permission to do them, (ii) would just need to inform them, or (iii) whether even informing them would not be necessary. The seven activities were: to visit her parents or other relatives who live outside of this community; to visit a friend or neighbor who lives in this community; to go to the city or a district capital to buy or sell something or to take care of some other business; to spend money on family needs (such as food, school materials, clothes for children); to spend money on her personal needs (such as clothes, shoes, or earrings); to get a job or to engage in commerce; and to do an HIV test. For each of the seven activities, responses were scored 0, 1 or 2, based on the three possible answers listed above.

A reliability analysis to assess whether the seven items are interrelated produced a Cronbach's alpha of 0.75, showing desirable internal consistency. To ensure a starker contrast between higher and lower levels of autonomy, the distribution is condensed into a dummy variable coded 1 for those whom the average of the seven responses were at least one standard deviation above the mean and 0 for the rest.

Marriage characteristics

Other independent variables of interest include a set of marriage characteristics. Although the women's decision-making autonomy indicator is a synthetic measure of women's autonomy, it is important to account for other aspects of women's status related to their current marital relations. Women's bargaining power and their ability to make and implement decisions regarding their children is likely to depend on the several context-specific marriage characteristics such as the payment of bridewealth and polygamous union. In the case of bridewealth, a dummy variable indicating if husband has paid bridewealth completely is included in the models, versus no payment at all or partial payment. Moreover, a dummy variable accounting for polygyny was also included.

Another relevant marriage characteristic that may affect children's survival chances is co-residence with in-laws. Male migration to South Africa is common in the study setting, and previous studies have shown that members of the extended family may have control over the migrant's wife when he is absent (Yabiku, Agadjanian, and Sevoyan 2010). The full paper will , models have a variable indicating if the woman co-resided with any adult in-laws (parents or siblings of her husband) in 2006. In this case, the variable is coded 1, and 0 otherwise.

Women's work outside the household

Women's employment has been shown to be associated with women's autonomy level. Moreover, women's participation in the labor force may change the traditional perception of the economic returns of investments made in female children. The variable that indicates women's work outside the household was based on the question: "In the past month (last 30 days), did you do any activity with an intention to earn money or to get products or things?". The variable is coded 1 if she did, and 0 if she did not. Because this is a characteristic that may change with time,

the variable is time-varying, and was coded using information from 2006 and 2009. For years of exposure 2006 and 2007, the variable is based on information collected in 2006. For years of exposure 2008 and 2009, the variable is based on data from 2009.

Women's education

Women's education is the most used indicator of women's autonomy in the literature regarding the effect of women's status and child's outcomes. The models account for women's education in 2006. The variable was coded using three different categories: no education, 1 to 4 years of study, and 5 or more years of study.

Controls

In addition to these main independent variables, a set of control variables related to children's mortality and women's autonomy is included in the multivariate analysis to reduce the chances of spurious association. They include women's and husband's age in 2006, and husband's education level in 2006. As for women's education, father's education level was coded in three groups: no education, 1 to 4 years of study, and 5 or more years of study.

The models also include a household economic status index. The index is time-varying and accounts for differences in household standard of living indicating ownership of selected consumer goods (radio, bicycle, car or motorcycle). Additionally, to control for household socioeconomic characteristics, size of agricultural land in 2006 was also included in the models.

A time-varying variable indicating the total number of living siblings was also included to account for possible effects of sibling rivalry over resources on child mortality. Moreover, because short birth intervals are related to children higher

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mortality rates, a dummy variable indicating birth interval equal or less than two years was included in the models. Models also control for child's gender and child's age.

Methods

To access the effect of mother's autonomy on under-five mortality the analysis uses discrete-time event-history models. Event history analysis was used to accommodate the possible censoring of observations. Children who were between 0 and 5 years old in 2006 were included in the sample. By the time they completed 5 years they were right-censored, as well as if they were alive and less than 5 years old by the time of the 2009 interview. Moreover, because the dates reported by women in the birth histories are not very precise, the risk of death was not modeled monthly but annually. It eliminates problems with imprecision of exact birth and death dates, but it also leads to many intervals being of the same length.

The analysis was conducted using discretized data, which included one year calendar for each year of exposure to the risk of death (Alisson, 1984). In this approach, each person-year of exposure is treated as a separate case. It is assumed that child was not at risk of death before the period analyzed. With the person-year file in hand, discrete-time event history models were estimated using logistic regression.

Because the analysis makes use of retrospective birth histories, observations are not independent regarding mother's and household's characteristics. This can be problematic since child mortality can be clustered within families (Curtis el al. 1993). There are many reasons why child mortality may not be independent between families. Siblings share the same environmental conditions, and consequently the same risks derived from dietary characteristics, water supply, housing and financial constraints. Some mothers can also experience more problems than others regarding conception, premature delivery or poor general health (Curtis et al. 1993, Das Gupta

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1990, Cleland and Zathar 1984). Due to the possibility of clustering of births and deaths, results have standard errors adjusted by clustering within households.

Initial examination indicated that the age pattern of mortality was linear rather than quadratic. Therefore, the model uses a linear specification of age for the discrete-time event history analysis.

In order to address possible endogeneity in the association between women's decision-making autonomy and children's under-five mortality, the full paper will use propensity scores as weights in the discrete-time event-history models. Therefore, models will account for the propensity of having a mother with high decision-making autonomy.

4. Preliminary Results

Table 1 presents the descriptive statistics for the variables used in the analysis. Of the 1916 children who constituted the sample, 7% died between 2006 and 2009. The percent of children who died in the analyzed period varies by gender of the child. In this sample, as for Mozambique in general, mortality is lower for daughters than for sons, 6% and 8% respectively. Approximately 72% of the children have mothers with high decision-making autonomy, proportion that is similar for boys and girls. Regarding women's marital characteristics, around 40% of children have mothers who said bridewealth was fully paid in the current union. At the same time, around half of the children in the sample were living with some member of their father's family, more specifically, father's parents or siblings. Finally, 20% of the children lived in polygamous families.

Table 1: Descriptive statistics of children's and family's characteristics.

	Total		Males		Females	
	Mean	SD	Mean	SD	Mean	SD
Child died	0.07	0.26	0.08	0.28	0.06	0.23
Marriage's characteristics						
Decision-making autonomy	0.38	0.49	0.38	0.48	0.37	0.48
Bridewealth paid	0.40	0.49	0.39	0.49	0.41	0.49
Coresidence with in-laws	0.50	0.50	0.51	0.50	0.50	0.50
Polygamous union	0.20	0.40	0.18	0.39	0.22	0.41
Mother's characteristics						
Mother's age	24.32	5.66	24.17	5.54	24.49	5.79
Number of children alive	3.40	1.61	3.35	1.58	3.46	1.64
Mother had short birth interval before child (<=24 months)	0.52	0.49	0.51	0.49	0.53	0.50
Mother's education						
No education	0.26	0.44	0.26	0.44	0.25	0.43
1 to 4 years	0.43	0.50	0.42	0.49	0.44	0.50
5 years or more	0.31	0.46	0.32	0.46	0.31	0.46
Work outside the household	0.25	0.39	0.25	0.39	0.25	0.39
Household characteristics						
Household economic status index	2.10	0.95	2.04	0.93	2.16	0.97
Size of agricultural land (in hectare)	1.73	1.34	1.73	1.42	1.74	1.24
Father's characteristics						
Father's age	34.86	8.13	34.60	8.12	35.15	8.15
Father's education						
No education	0.16	0.37	0.16	0.36	0.17	0.38
1 to 4 years	0.44	0.50	0.44	0.50	0.43	0.50
5 years or more	0.40	0.49	0.40	0.49	0.40	0.49
N	1916		977		939	

Source: **Childbearing Dynamics in a Setting of High HIV Prevalence and Massive ART Rollout Survey, 2006 and 2009.**

Regarding women's characteristics, average mother's age in the sample is 24 years old. The mean number of living children is 3.4, with a small variation for boys

and girls, 3.35 and 3.46 respectively. At the same time, 52% of the children of the sample were born less than two years after their immediately older sibling. The percentage of short birth interval is higher for females (53%) than for males (51%). Moreover, only 25% of children have mothers who work outside the household. Several of them, around 43%, have mothers with 1 to 4 years of schooling. Similarly, this is the educational group with the highest proportion of fathers. For 44% of children, fathers have 1 to 4 years of formal education. The mean age for fathers is 34 years old, approximately 10 years more than the mean age for mothers. Around 43% of the children have a migrant father. Finally, households have, on average, 1.73 hectares of agricultural land. The mean economic status index is higher for females, 2.16, than for males, 2.04.

Table 2 presents the preliminary results of the multivariate analysis of the relationship of women's decision-making autonomy and under-five mortality. To assess the effect of women's decision-making autonomy on mortality, two different models were estimated for the total sample and for male and female children separately. In each pair of models, Model 1 includes the effect of women and marriage characteristics, and other sociodemographic predictors on under-five mortality. Model 2 adds women's decision-making autonomy level to the previous model.

Table 2: Effect of women's decision-making autonomy on child's mortality

	Total		Males		Females	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Decision-making autonomy		-0.78(0.34)*		-1.25(0.44)**		-0.28(0.53)
Marriage's characteristics						
Bridewealth paid	-0.27(0.31)	-0.29(0.30)	-0.35(0.38)	-0.36(0.38)	-0.15(0.55)	-0.16(0.53)
Coresidence with in-laws	-0.11(0.28)	-0.11(0.29)	-0.05(0.35)	0.00(0.36)	-0.2(0.47)	-0.21(0.46)
Polygamous union	-0.17(0.4)	-0.16(0.41)	-0.82(0.65)	-0.62(0.67)	0.34(0.55)	0.30(0.58)
Child's characteristics						
Child is female	-0.42(0.28)	-0.40(0.28)				
Child's age	0.03(0.09)	0.00(0.00)	-0.09(0.12)	-0.07(0.13)	0.23(0.14)	0.23(0.14)[+]
Mother's characteristics						
Mother's age	0.12(0.03)***	0.10(0.03)***	0.11(0.04)**	0.10(0.04)*	0.12(0.04)**	0.12(0.04)**
Number of children alive (time-varying)	-1.00(0.14)***	-0.99(0.14)***	-1.11(0.16)***	-1.10(0.16)***	-0.88(0.22)***	-0.88(0.22)***
Mother had short birth interval before child	2.16(0.34)***	2.13(0.35)***	2.19(0.41)***	2.26(0.42)***	2.2(0.62)***	2.17(0.62)***
Mother's education (omitted= no education)						
1 to 4 years	-0.20(0.34)	-0.15(0.34)	0.1(0.44)	0.21(0.45)	-0.77(0.53)	-0.78(0.53)
5 years or more	-0.43(0.38)	-0.39(0.38)	-0.3(0.53)	-0.23(0.55)	-0.59(0.52)	-0.61(0.51)
Work outside the home (time-varying)	0.13(0.24)	0.17(0.24)	0.18(0.31)	0.26(0.31)	0.04(0.44)	0.05(0.43)
Household characteristics						
Household economic status index	-0.09(0.14)	-0.11(0.14)	-0.08(0.18)	-0.14(0.18)	-0.13(0.31)	-0.12(0.30)
Size of agricultural land	-0.04(0.1)	-0.06(0.10)	-0.01(0.12)	-0.03(0.12)	-0.07(0.17)	-0.09(0.18)
Husband's characteristics						
Husband's age	0.05(0.02)*	0.07(0.02)**	0.07(0.03)*	0.09(0.03)*	0.04(0.03)	0.04(0.04)
Husband's education (omitted= no education)						
1 to 4 years	-0.78(0.34)*	-0.83(0.34)*	-0.7(0.48)	-0.85(0.48)+	-0.71(0.51)	-0.68(0.50)
5 years or more	-0.21(0.36)	-0.16(0.35)	0.04(0.52)	0.20(0.50)	-0.51(0.52)	-0.48(0.53)
N	6874	6874	3524	3524	3350	3350

Source: As for Table 1. Significance levels + p<0.1, * p<.05; ** p<.01, ***p<0.001.

Consistent with the literature, Model 1 shows a significant positive association between short birth spacing and under-five mortality. The effect of short birth spacing is significant for both boys and girls. Number of children alive is negatively correlated with the chances of dying for both boys and girls. One could expect that a

higher number of children in the household could raise child's chances of dying because of the dilution of resources among siblings. However, since models already control for short birth spacing, which can be capturing the negative effect of having a sibling of similar age, a larger number of siblings can also represent a larger number of possible caregivers. Moreover, mother's age is significantly correlated with under-five mortality. For instance, children of older mothers are expected to have higher chances of death.

It is also noteworthy the effect of husband's characteristics. Similarly to mother's age, higher husband's age is associated with greater likelihood of dying for children. Father's educational level also seems to have an important effect on children's chances of survival. Children whose father has 1 to 4 years of schooling have lower chances of dying than children whose father has no formal education. When models are estimated by sex of the child, the effect of father's characteristics remain significant only for boys. Marriage characteristics of interest, namely bridewealth, co-residence with in-laws and polygyny, and women's work and education are not significant in Model 1 for the full sample.

The second model adds the women's decision-making autonomy indicator in each pair of models to tests the hypothesis that this aspect of women's status affects the likelihood death among children, regardless of other marriage characteristics and individual characteristics associated with women's status. As the results show, decision-making autonomy has a negative significant effect on the likelihood of dying. This supports hypothesis H1 and is consistent with the previous literature on the beneficial effects of women's status on children's health outcomes. Moreover, marriage characteristics and women individual characteristics (education and work)

are not significant, and therefore not mediated by the decision-making autonomy index.

When we look at the effect of women's decision-making autonomy by gender, autonomy has a negative and significant effect on sons' chances of dying but has no effect on daughters' mortality. Even when controlling for the marital and individual characteristics related to women's ability to make decisions regarding children, decision-making autonomy has an independent negative association with sons' likelihood of dying between ages 0 and 5. This result supports hypothesis H3 about the association between higher decision-making autonomy for women and better chances of survival for their male children.

5. Discussion and next steps

The study aims to examine the association of women's decision-making autonomy and under-five mortality. This preliminary analysis yielded instructive results. First, the results support hypothesis H1 about the effect of women's decision-making autonomy on under-five mortality. The results show that a child whose mother has higher decision-making autonomy has lower chances of dying. Second, the models also provide support for hypothesis H2. The effect of women decision-making power is significant and independent of other characteristics related to women's status, illustrating the importance of considering other predictors of status besides the traditional measures of education, workforce participation and marriage. The autonomy index is a construct based in a variety of questions regarding women's ability to make decisions about themselves, the household and their children. Although it may capture the effect of characteristics other than women's individual behavior, the results show that the effect of women's decision-making autonomy is not contained in women's education, work and marriage variables either.

Women with higher decision-making power may be better able to participate in decisions regarding the intra-household allocation of resources, increasing the investments in their children's health. Moreover, mothers' higher decision-making power may enhance children's chances of survival through higher mobility and, therefore, easier access to health services for their kids. Finally, it is possible that women with higher autonomy may have greater control over decisions regarding aspects related to their children's nutrition and care, which could have a positive impact on children's chances of survival.

Yet, the preliminary results also shows that these consequences are gendered. When I split the sample by gender of the child, the associations between mother's decision-making autonomy and under-five mortality is only significant for sons (in support of H3). It is possible that in a patrilineal society like the one examined here, where sons are traditionally prioritized in the household allocation of resources, the higher decision-making power helps women to improve boys' chances of survival. As stated in the literature about gender effects of autonomy on child's health, women may use their higher decision-making power to enhance the investments made in their sons' health, since male children are more likely to support them at older ages.

However, it is important to highlight that although studies show significant benefits of higher maternal autonomy for girls' welfare, in the specific case of mortality, boys are the ones disadvantaged. Mozambique presents an excessive male under-five mortality: it was 107 per thousand among boys and 99 per thousand among girls in 2011 (Unicef 2013). Therefore, women with higher decision-making power may use their higher ability to make and implement decisions regarding their time use, allocation of resources, childcare and use of health services to enhance the chances of survival of the children suffering from the higher risk of dying. Both

aspects are likely to play a role in the fact that the association between mother's autonomy and child survival is gendered, and has a significant impact only for boys. Women may perceive their male children as more valuable, and having higher returns in the future in the form of economic and social support. However, they are also the ones with higher chances of dying, and therefore more likely to benefit from mother's improved ability to access health related resources.

The full paper will investigate possible pathways for the association of women's autonomy and child survival in this context. Because rural southern Mozambique is an area of intense male labor migration, the paper will test if partner's absence, duration of absence, and economic success of partner's migration mediate the effect of women's autonomy on child's chances of survival.

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