Child Marriage and Adolescent Pregnancy in Mozambique:
Causes and Impact

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Preface

The purpose of the UNICEF Mozambique, UNFPA and Coligação para a Eliminação e Prevenção dos Casamentos Prematuros (CECAP) – commissioned report 'report *Statistical Analysis of Child Marriage and Adolescent Pregnancy in Mozambique: Determinants and Impacts 2014* is to analyze and better understand the magnitude, trends over time, determinants and impacts of child marriage and adolescent pregnancy to inform national policy design. This study provides analytical support for national advocacy purposes and evidence-based policy design to reduce child marriage in Mozambique. Knowing the determinants and impacts of child marriage is essential for improving evidence-based programme design and identifying the adequate channels and entry points for eliminating child marriage as well as ensuring all key line ministries and organizations are conscious of the need for focusing on child marriage.

The need for this study stems from the Government of Mozambique, civil society members who are part of the National Coalition to Eliminate and Prevent Child Marriage and UN agencies in Mozambique.

Findings of this study will contribute to inform the broader policy discussion in Mozambique on the issues of child marriage, adolescent pregnancy, girls' education and prevailing social norms which constitute barriers to fulfilment of children's rights, especially girls. More specifically findings from this study will be used by UN agencies and development partners' in providing technical assistance to the Government of Mozambique in designing and revising national policies and strategies for adolescent girls. Policies to this effect include the development of child marriage-specific policies, such as the development of the National Costed Strategy to Prevent and Eliminate Child Marriage in Mozambique (2015-2019) and informing the implementation of cross-sectoral policies in Education, Health and HIV/AIDS, inter alia the National Plan of Action for Children - PNAC II, the National Strategic HIV/AIDS Response Plan (PEN IV), Multisectoral Action Plan for the Reduction of Chronic Undernutrition in Mozambique (2011-2020) and sectoral policies in Education and Health. Furthermore, findings will inform advocacy efforts to increase government investment programmes focusing on adolescent girls, and ensuring that development partners' investments on programmes for adolescent girls more broadly as well as child-marriage specific programmes to delay age of marriage and reduce adolescent pregnancy are channeled to programmes areas which have the most potential for impact on lives of adolescent girls.

This study has demonstrated the power of evidence-based advocacy and programming, as this research piece directly led to the definition of child marriage as a national priority by the Government of Mozambique, defined the pillars of the national strategy - National Costed Strategy for Prevention and Elimination of Child Marriage (2015-2019) and is being used to inform programme design on adolescent girls for government, civil society and United Nations. Additional benefits of this study, given the participatory process from inception to completion, involving wide array of stakeholders from civil society who are members of the National Coalition for Prevention and Elimination of Child Marriage (national chapter of the global 'Girls not Brides' partnership) is that a national movement against child marriage is taking shape in Mozambique, as a considerable number of civil society organizations which are members of this broad alliance, have become a leading knowledgeable and evidence driven advocates for action against child marriage and have acquired a seat at decision making on child marriage at par with the Government of Mozambique.

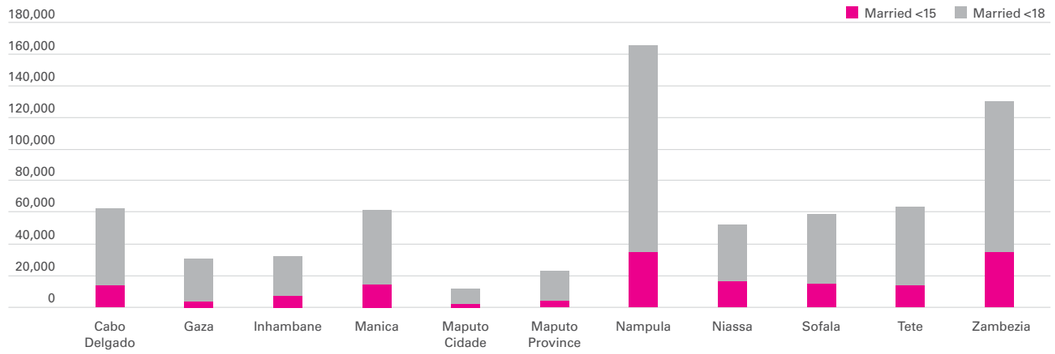
Executive Summary

The UNICEF Mozambique, UNFPA and Coligação para a Eliminação e Prevenção dos Casamentos Prematuros - commissioned *'Statistical Analysis of Child Marriage and Adolescent Pregnancy in Mozambique: Determinants and Impacts'* a secondary data analysis of Demographic and Health Surveys of Mozambique (DHS) 1997, 2003, 2011, Multiple Indicator Cluster Survey (2008), Census projections (2007), and administrative data from the Ministry of Education. This study provides analytical support for national advocacy purposes and evidence-based policy design to reduce child marriage in Mozambique.

Chapter 1: Overview of current situation

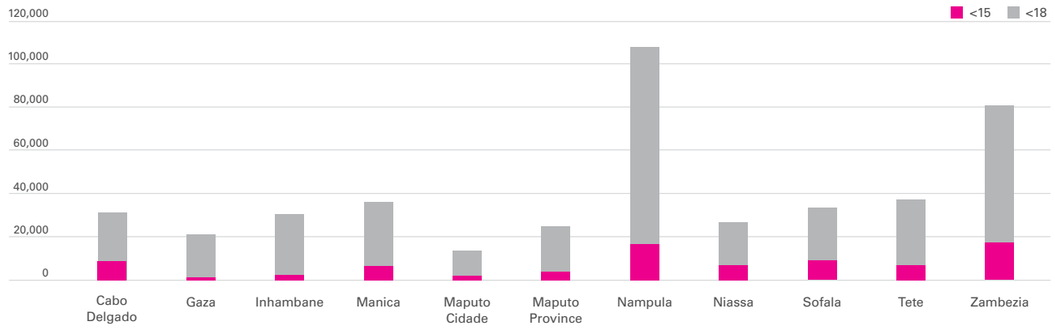
- 14.3% of Mozambican girls between the ages of 20 and 24 were married before 15 years of age. The proportion of girls in the same age group married before 18 is 48.2%.
- The highest rates of child marriage were found in Northern provinces. In Niassa, 24.4% of girls aged 20-24were married before 15 (representing 13,865 girls). The provinces that have the largest numbers of girls married in their teens are Zambezia and Nampula with 95,525 and 129,604 girls married before 18, respectively (see Figure 1 below). In total, more than half a million Mozambican girls aged 20-24 got married before the age of 18, 56,323 of whom were married before they reached 15 years of age.
- Girls in urban locations start getting married later than rural girls, and continue getting married until later as well. This translates into a higher median age of marriage in urban areas (19.6 years, vs 18.2 in rural areas), as well as lower proportions of girls married before 15 (11.5% in urban vs. 16.1% in rural areas) and before 18 (55.7% in rural vs. 36.1% in urban areas). In terms of adolescent pregnancies, the gap between urban and rural areas is less pronounced, partly due to the higher frequency of pregnancies out of wedlock in urban areas: 5.9% vs. 9.0% pregnant under 15 in urban/ rural areas, respectively and 33.2% vs. 44.4% pregnant before 18 in urban/ rural areas. Girls with secondary and higher education tend to get married significantly later (17.5 years and 20.7 years on average, respectively) than girls with only primary or no education (16.1 and 16.5 years, respectively). However, since the DHS does not contain information on the exact date of school drop-out, this study does not allow us to determine whether this is due to the fact that educated women choose to get married later, or that girls who get married early are forced to leave school early.
- The problem of adolescent pregnancy is still closely associated with child marriage, as the overwhelming majority of adolescent mothers were married in their teens. However, in urban areas and particularly in the south of the country, there has been a rise in adolescent pregnancies out-of-wedlock due to a rise in births out of wedlock.
- The provinces with the highest rates of adolescent pregnancies are Manica (44.9% of women aged 20-24 pregnant before 18 and 8.5% pregnant before 15) and Niassa (41.5% before 18 and 11.7% before 15). The largest numbers of adolescent pregnancies are found in Nampula (107,553 girls, and Zambezia 81,126 girls aged 20-24 were had their first child before 18, see Figure 2 below). In total, more than 439,453 women aged 20-24 in Mozambique in 2011 had their first child before their 18th birthday, 85,257 of which concerned mothers who were aged less than 15 at the birth of their first child.

Figure 1: Absolute number of women aged 20-24 who were married before 15/18, by province



Source: Author's calculations based on Census projections (2011) and DHS (2011)

Figure 2: Absolute number of women aged 20-24 who had their first birth before 15/18, by province



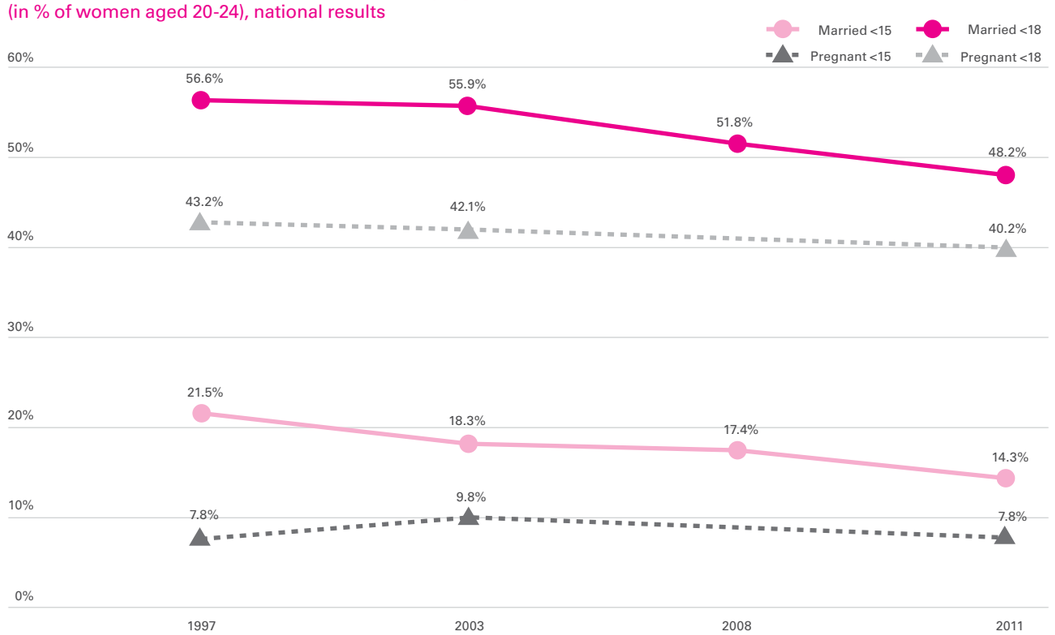
Source: Author's calculations based on Census projections (2011) and DHS (2011)

Chapter 2: Trends in child marriage and adolescent pregnancies

- The proportion of girls married and pregnant in their teens decreased slightly between 1997 and 2011. However, only for two of these indicators (married before 15 and married before 18) was the improvement statistically significant at the 5% level. In all cases, population growth outpaced the progress made in decreasing rates of child marriage and adolescent pregnancies, meaning that absolute number of girls married / pregnant before 15/18 increased in spite of the slight improvement in the percentage of girls affected (see Figure 3 opposite).
- Most provinces saw improvements in their rates of child marriage between 1997 and 2011. However, these changes remained statistically insignificant in most provinces.
- In most provinces, due to fast population growth, the absolute number of girls exposed to the problem of child marriage continues grow, in spite of the decrease in the percentage of girls exposed.
- Two provinces (Nampula and Maputo) have seen statistically significant increases in their rates of pregnancies before 15 between 1997 and 2011. The largest increase in the number of adolescent pregnancies took place in Nampula, where an additional 27,052 pregnancies before 18 occurred in 2011 compared to 2003.

Girls living in female-headed households have a significantly lower probability of getting married before 18 than girls living in male-headed households.

Figure 3: Trends in child marriage and adolescent pregnancies from 1997 to 2011 (in % of women aged 20-24), national results



Source: MEASURE DHS Project, ICF International, Washington D.C (1997, 2003, 2011) and MICS report (2008)

Chapter 3: Determinants of child marriage and adolescent pregnancies

- A large part of the variation in rates of child marriage is explained by religious and regional differences, rather than by social or economic factors. Wealth is negatively associated with child marriage, but there is little difference in rates of child marriage below the top wealth quintile. Girls' empowerment, and in particular their ability to demand contraception from their husband, plays an important role in preventing adolescent pregnancies once we control for child marriage.
- Girls living in female-headed households have a significantly lower probability of getting married before 18 than girls living in male-headed households. Similarly, the probability of entering into child marriage decreases unambiguously with the age of the head of household.
- All else things being equal, girls from urban areas are significantly more likely to get pregnant before the age of 15 than girls from rural areas, although they are more likely to have access to information through radio and other means, which is found to reduce the likelihood of getting pregnant before the age of 15.

Chapter 4: Impacts of child marriage/ pregnancy on wellbeing outcomes

- There are general disparities between regions: women and children in the Southern region, comprising Inhambane, Gaza and Maputo Province and City, tend to be better off in terms of all of our outcome variables than those in the Central and Northern regions.
- Child marriage is associated with a significantly lower likelihood of finishing primary school and starting secondary school. These results hold at the national and regional level, though the experience between regions differs.
- The children of adolescent mothers are significantly more malnourished than children of mothers in other age groups at the national level. Further investigation finds that this effect is most pronounced and robust to controls in the Northern region, but it cannot be precisely estimated the Southern or Central regions.
- The children of adolescent mothers have a higher likelihood of death than the children of mothers in other age groups. However, there are indications that other factors than the mother's age are the main determinants of death so none of the relationships could be precisely estimated. The relationship between the mother's age and likelihood of death was strongest in the Northern region.
- Child marriage was not significantly related to either child malnutrition or likelihood of child death. This is not to say that the children of mothers who were married early are not at risk, but rather recognises that the age of the mother at their birth is the more relevant factor (where significant relationships are found) than her marital status.
- Younger mothers are more likely to have a skilled attendant present at the birth of their children[1], particularly if they are under 18. Due to the absence of exploitable maternal mortality data, we were unable to determine whether this translates into a lower probability of dying in labour for these mothers, or if, on the contrary, it is a reflection of the fact that a translates into a lower probability of dying in labour for these mothers, or if, on the contrary, it is a reflection of the fact that a higher proportion of adolescent mothers experience complications during pregnancy, which call for medical assistance.
- Use of skilled birth attendants is best predicted by privilege measures – household wealth, proximity to the capital and mother's education level. This suggests concern around the presence of skilled attendants should be focused on providing the services to women in all age groups from less privileged backgrounds.
- Child marriage is not significantly associated with the use of skilled attendants in any region or at the national level, with or without controls for other factors.
- Girls who married before 18 started bearing children earlier than other girls, but also stopped having children earlier. Insofar as birthing children at younger ages and in shorter intervals poses a health risk to mother and child, it is likely that child marriage contributes to increasing the risk of maternal and child death.

[1] Skilled attendance at birth is considered if a doctor, nurse, birth attendant, or any of three other health professionals assisted at the delivery of the child.

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LIST OF ABBREVIATIONS

OPM	Oxford Policy Management
DHS	Demographic Health Survey
MICS	Multiple Indicator Cluster Survey
OLS	Ordinary Least Squares
WHO	World Health Organisation
WASH	Water, Sanitation and Hygiene
UNICEF	United Nations International Children's Fund

01 Introduction

This UNICEF Mozambique, UNFPA and Coligação para a Eliminação e Prevenção dos Casamentos Prematuros (CECAP) - commissioned 'Statistical Analysis of Child Marriage and Adolescent Pregnancy in Mozambique: Determinants and Impacts' was carried out by Oxford Policy Management (OMP) consultants Dr. Sebastian Silva-Leander, Barnali Basak, Patrick Schneider based on identified needs stemming from the Government of Mozambique, civil society members who are part of the National Coalition to Eliminate and Prevent Child Marriage and UN agencies to better understand the magnitude, trend over time, determinants and impacts of child marriage and adolescent pregnancy to inform national policy design. For the purpose of this study, data used included Demographic and Health Survey (DHS) 2011, Multiple Indicator Cluster Survey (2008), Census projections (2007), and administrative data from the Ministry of Education.

Findings of this study will contribute to inform the broader policy discussion in Mozambique on the issues of child marriage, adolescent pregnancy, girls' education and prevailing social norms which constitute barriers to fulfilment of children's rights, especially girls.

02 Overview of the current situation

2.1 CHILD MARRIAGE

The paper looks at child marriage under two main age cut offs: First cut-off age: before 15 years. Second cut-off age: before 18 years. In Mozambique, child marriage is illegal before the age of 18 is illegal, although the law allows for exceptions up to 16 years of age where there is consent from the child's parents (Family Law 2004).

In the DHS 2011 survey, marriage is defined as women who first married or lived with a man, i.e. age at first cohabitation. Marriage age is determined by the 'age at first union' collected in the *DHS 2011* and hence does not directly measure the formal institution, but rather the fact of cohabitation. The relevant dummies are generated with the age cut offs – cohabitation below 15 years; and cohabitation below 18 years.[2]

[2] Note that the definition used here is slightly different to what is used in DHS 2011 due to different interests. Here we report child marriage categories among all respondents, whereas DHS 2011 does so for the group that has ever joined in a union. This difference is appropriate given our interest in the relationship between child marriage status and other factors relevant to married and unmarried people alike.

The proportion of respondents in each age bracket is shown in Table 1 below, disaggregated by sex, province and ten year age-group. The most striking result is the difference between boys and girls. No male respondent in our sample was married prior to the age of fifteen and less than ten per cent overall were married before the age of 18; this is in contrast to 48.2 per cent of female respondents aged 20-24 who were married before the age of 18 and 14.3% before the age of 15.

Among female respondents, the proportions married early varies across provinces– Southern provinces close to the capital tend to have lower rates of child marriage.

The breakdown by urban/ rural location, shows that the problem of child marriage is more widespread in rural areas than in urban areas, with 11.5% of girls married before 15 in urban areas, compared to 16.1% in rural areas.

In Table 2 below, we have estimated the absolute number of girls married before the ages of 15 and 18, by using the latest available census projection data. This allows us to see that although the highest rates of marriage before 15are found in Niassa, there are more girls in Nampula and Zambezia who have been exposed to this problem. This is because these two provinces are more populous than Niassa, as well as having very high rates of child marriage. The provinces with the smallest number of girls married before 15 and 18 are Maputo Province and Maputo City, which combine low rates of child marriage with relatively small populations.

Table 1: % of all respondents aged 20-24 who were married before 15/18, by gender, province and area of residence

	FEMALE		MALE
	Under 15	Under 18	Under 18
Total	14.3	48.2	8.7
Urban	11.5	36.1	4.8
Rural	16.1	55.7	11.8
Province			
Niassa	24.4	55.7	2.4
Cabo Delgado	17.6	60.7	5.2
Nampula	17.0	62.3	11.9
Zambezia	17.1	47.1	11.8
Tete	13.7	51.6	14.2
Manica	17.7	59.2	10.8
Sofala	16.8	49.4	4.4
Inhambane	11.2	39.1	6.6
Gaza	7.1	40.9	5.7
Maputo Province	5.2	25.6	1.6
Maputo City	2.5	14.9	3.9

Notes: all proportions are adjusted for survey structure.

Source: Author's calculations from DHS 2011

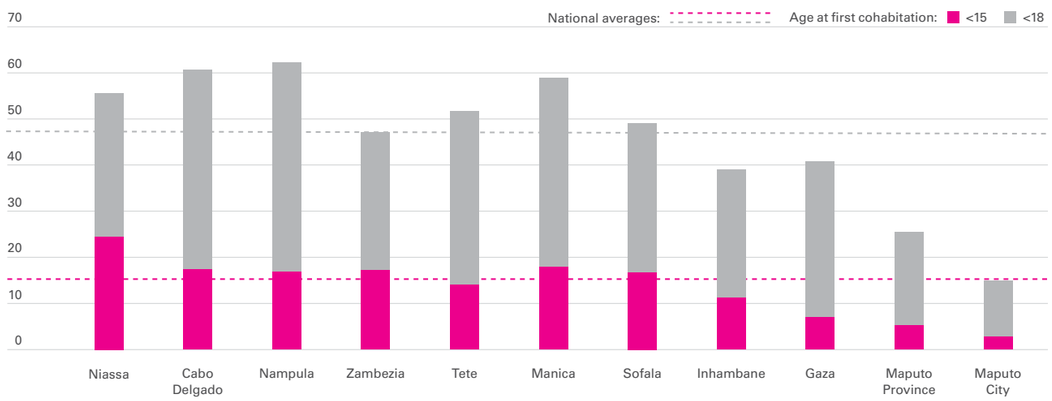
Table 2: Absolute number of women aged 20-24 who were married before 15/18, by province

Province	Girls Married <15	Girls Married <18	Boys Married < 18
Cabo Delgado	13,865	60.7	5.2
Gaza	4,498	25,910	2,646
Inhambane	7,368	25,723	3,170
Manica	14,102	47,167	7,598
Maputo Cidade	1,659	9,890	2,435
Maputo Province	3,841	18,907	1,064
Nampula	35,365	129,604	21,334
Naissa	15,879	36,248	1,372
Sofala	14,902	43,819	3,521
Tete	13,330	50,207	12,482
Zambezia	34,681	95,525	19,404
Total*	**156,323**	**526,907**	**95,106**

*Note: For statistical accuracy, the total number of girls/ boys married before 18/ 15 is computed from the national rate of child marriage and not as the aggregate of provincial numbers of girls/ boys married before 15/ 18.

Source: Author's calculations based on Census projections (2011) and DHS (2011)

Figure 4: Percentage of women aged 20-24 who were aged < 15 / <18 at their first cohabitation, by province



Source: Author's calculations based on DHS 2011 datasets.

2.2 ADOLESCENT PREGNANCY

The variables constructed for the study of early pregnancy are generated with the two age cut offs – before 15 years; and before 18 years. The proportion of respondents in each category is shown in Table 3 below, disaggregated by gender, province and are of residence. Again, early parenthood is overwhelmingly a female phenomenon, with 40.2% bearing children before 18, compared to only 3.8% of males (of whom none reported becoming a father before age 15).

In terms of adolescent pregnancies, the urban rural gap is less pronounced than for child marriage (5.9% of girls in urban areas pregnant before 15 vs. 9.0% in rural areas). This is due to the more frequent occurrence of pregnancies out of wedlock in urban areas.

In Table 4 below, we have estimated the absolute number of women who had their first child before the ages of 15 and 18, by combining the DHS results with the latest census projections. Again, we find that the provinces that have the largest number of adolescent pregnancies are Nampula and Zambezia. In Zambezia, the problem of adolescent pregnancies is particularly pronounced before the age of 15, with 17,848 girls between the ages 20 and 24 having given birth before the age of 15 (representing 8.8% of all girls aged 20-24). In Nampula, by contrast, the number of pregnancies before 15 is relatively lower (16,851 girls aged 20-24), while the number of pregnancies before 18 is the highest in the country, representing 107,553 girls (51.7% of girls).

Table 3: % of all respondents aged 20-24 who had their first birth before 15/ 18, by gender, province and area of residence

	FEMALE		MALE
	Under 15	Under 18	Under 18
Total	7.8	40.2	3.8
Urban	5.9	33.2	3.1
Rural	9.0	44.4	4.4
Province			
Niassa	11.7	41.5	9.5
Cabo Delgado	11.4	40.2	2.1
Nampula	8.1	51.7	5.3
Zambezia	8.8	40.0	4.8
Tete	7.9	38.2	4.0
Manica	8.5	44.9	5.2
Sofala	10.1	37.5	1.4
Inhambane	4.9	46.9	2.4
Gaza	2.8	32.9	5.7
Maputo Province	5.4	33.9	1.6
Maputo City	2.8	20.5	1.0

Notes: all proportions are adjusted for survey structure.

Source: Author's calculations from DHS 2011

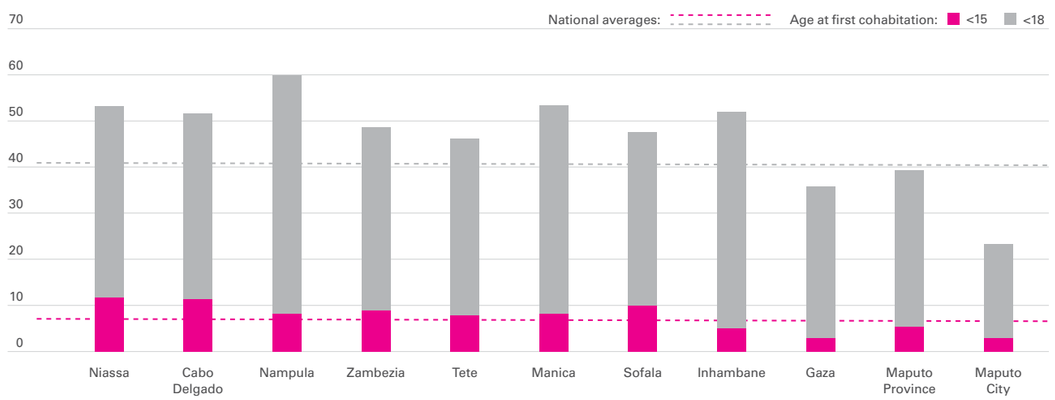
Table 4: Absolute number of women aged 20-24 who had their first birth before 15/18, by province

Province	Mother <15	Mother <18	Father < 18
Cabo Delgado	8,981	31,670	1,424
Gaza	1,457	20,842	2,646
Inhambane	3,224	30,854	1,153
Manica	6,772	35,774	3,658
Maputo Cidade	1,858	13,607	624
Maputo Province	3,988	25,037	1,090
Nampula	16,851	107,553	9,502
Naissa	7,614	27,007	5,432
Sofala	8,959	33,263	1,120
Tete	7,687	37,169	3,516
Zambezia	17,848	81,126	7,893
Total*	**85,267**	**439,453**	**41,540**

*Note: For statistical accuracy, the total number of girls/ boys pregnant before 18/ 15 is computed from the national rate of adolescent pregnancy and not as the aggregate of provincial numbers of girls/ boys pregnant before 15/ 18.

Source: Author's calculations based on Census projections (2011) and DHS (2011)

Figure 5: Percentage of women aged 20-24 who were aged < 15 / <18 at their first birth, by province



Source: Author's calculations based on DHS 2011 datasets.

2.3 RELATIONSHIP BETWEEN MARRIAGE AND CHILDBIRTH

Marriage and pregnancy are very closely related. Table 5 below shows the proportions of women who are in the early pregnancy categories, conditional on their child marriage category. It is clear from this table that being married early is closely related to having children early. Both groups of early married girls are much more likely to have children once they're married than the girls who are not married at that age. For example, 38.7% of girls who married under fifteen also had children before they were fifteen, as opposed to just 2.7% (2.6%) of girls who married between 15 and 18.

Furthermore, Figure 6 shows the distribution of interval between first marriage and first birth where the latter proceeded the former. Here it is clear that the first birth is commonly close to the marriage date (the median interval is 15 months) and rarely more than two years after it (the third quartile interval is 26 months).

Recognising this close relationship is important because in our analyses we are interested in both child marriage and early pregnancy. Analysed separately (for example, by using the variables to split groups and compare averages), the effects of one will inevitably pick up the effects of the other. Hence, it is necessary to control for both to find out what impact they each have in the presence of the other. We would expect that in some cases one of the factors that seems influential when analysed on its own will not be significant when the other is controlled for. For example, although the age of the mother is significantly related to infant mortality rates, her marriage status is not.

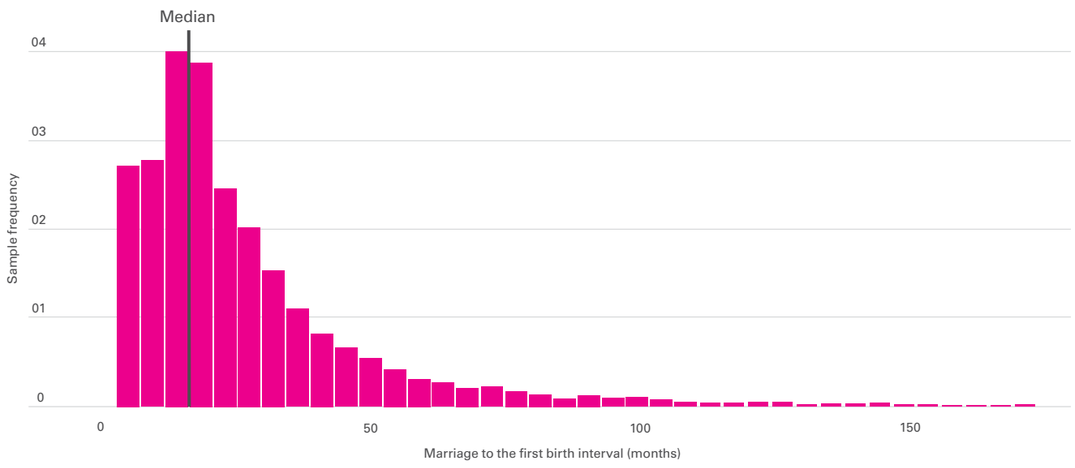
Table 5: Cross-tabulation of early pregnancy proportions conditional on child marriage

	EARLY CHILDREN CATEGORIES			
Child marriage categories	<15	15-18	Neither	Total
<15	38.7%	45.0%	16.3%	100
15-18	2.7%	51.2%	46.1%	100
Neither	2.6%	10.3%	87.0%	100

It is clear that being married early is closely related to having children early.

38.7% of girls who married under fifteen also had children before they were fifteen.

Figure 6: Distribution of interval between marriage and first birth for all births within wedlock



03 Trends

Figure 7 overeaf presents trends over the period 1997 to 2011 for some key statistics related to child marriage and adolescent pregnancies. The specific indicators presented, as well as the years of comparison were restricted by the availability and comparability of data between surveys in different years. In particular, we have restricted our comparison of disaggregated figures to DHS surveys in order to ensure the comparability of statistics provided in various years. Furthermore, the estimation of absolute numbers was restricted by the census projections provided.

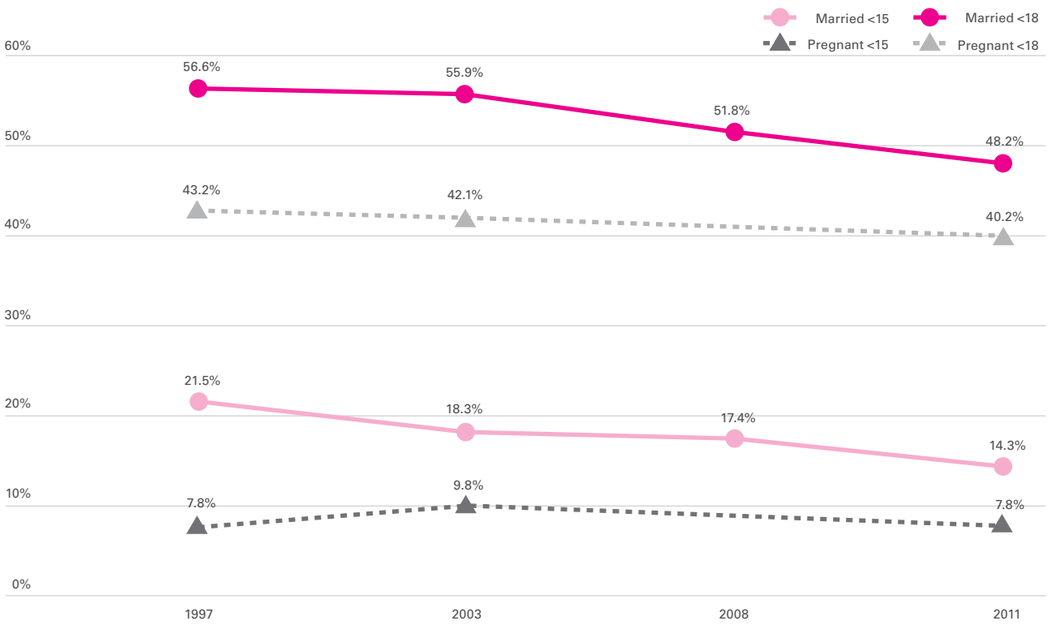
The statistics presented in Figure 7 below shows that there has been an improvement in all the indicators under consideration here in percentage terms. However, the changes over the period 1997-2011 were only statistically significant at the 5% level for the indicator related to marriage before the age of 15 and 18[3], which decreased by 7 and 8 percentage points respectively between 1997 and 2011. The change in the proportion of adolescent pregnancies over this period was not statistically significant. It is therefore not possible to say with confidence that there has been a decrease in the proportion of adolescent pregnancies over this period.

[3] Percentage of women aged 20-24, who were married before 15 and before 18.

Furthermore, when looking at the changes in the absolute numbers of girls affected by these problems, we find that the number of girls affected by these problems increased in absolute terms over the period 2003-2011[4]. This means that there were more girls married and pregnant before 18 in 2011 than in 2003 (+55,834 and +84,834, respectively), in spite of the slight decrease in the proportion of girls affected.[5]
In Table 6 (right), we show the breakdown by province of the percentage of women aged 20-24 who were married before the age of 15. This breakdown shows that the most significant changes in child marriage took places in Cabo Delgado and Nampula, which saw the percentages of girls married before 15 decrease from 45.2% and 52.5% respectively in 1997 to around 17% in both provinces in 2011.

These changes were statistically significant at the 0.1% level. The other provinces that saw a statistically significant changes in the rate of child marriage were Gaza, Inhambane and Maputy City (significant at the 5% level). In Gaza and Inhambane, the rate of marriage before 15 increased over the studied period. None of the other provinces saw statistically significant changes over the studied period. Furthermore, in many of these provinces, the reported rates fluctuated over the studied period without showing a consistent trend. We have estimated the change between 2003 and 2011 in the absolute number of girls married before 15, based on the 2007 census projections.

Figure 7: Trends in child marriage and adolescent pregnancies from 1997 to 2011 (in % of women aged 20-24), national results



Source: MEASURE DHS Project, ICF International, Washington D.C. (1997, 2003, 2011) and MICS report (2008).

[4] It should be noted that the figures presented in Figure 7 refer to the change in the absolute number of girls aged 20-24 who declare having been married before the age of 15, rather than the proportion of girls aged 0-15 who are currently married in any given year. This limitation is due to the formulation of the early marriage question in the DHS questionnaire which is formulated as a recall question.

[5] Note that these estimates were generated using 2007 census projections. In order to estimate the relevant reference population for the period 2003-2006, we have used linear extrapolations based on 2007-2014 trends.

[6] Note that the indicator for teenage pregnancy reported in Figure 7 differs from the one reported in the DHS report. The indicator reported here refers to women aged 20-24 who had their first child before 15/ 18 years of age. The indicator reported in the DHS report refers to women currently aged 15-19 who have a child or are/ have been pregnant.

According to these estimates, the only provinces that saw a reduction in the absolute number of girls married before 15 over the period 2003-2011 were Nampula (-15,216), Zambezia (-7,180) and Cabo Delgado (-5,559). In all other provinces, it is estimated that population growth outpaced the rate of reduction in child marriage. The province that saw the largest increase in the number of married girls was Tete, where it is estimated that the number of girls married before 15 increased by 5,292 between 2003 and 2011. When looking at marriage among before 18, we find that the largest decrease in percentage terms took place in Nampula and Tete provinces, where the proportion of married girls fell from 82.3% to 62.3% and from 72.7 to 51.6% respectively between 1997 and 2011. These changes were statistically significant at 1% and 0.1%, respectively.

Based on the census projections we have estimated the reduction in the absolute number of married girls before 18 between 2003 and 2011. According to these estimates, only four provinces saw a reduction in the absolute number of girls married before 18 during this period. These are Zambezia (--8,162), Cabo Delgado (-2,602), Gaza (-2,181) and Maputo City (-2,652). In all other provinces, it is estimated that population growth outpaced the rate of reduction in adolescent marriage, meaning that the number of girls married in their teens increased over this period. The provinces that saw the largest increase in the number of married adolescent girls were Tete (+12,052) and Manica (+13,807).

Table 6: Trends in child marriage (before 15) between 1997 and 2011 (in % of women aged 20-24), by province

Province	1997	2003	2011	Change % (1997-2011)	Change # (2003-2011)
Cabo Delgado	45.3%	28.2%	17.6%	***	-5,559
Gaza	1.9%	8.5%	7.1%	*	288
Inhambane	3.5%	8.1%	11.2%	*	2,861
Manica	6,772	35,774	3,658		3,584
Maputo Cidade	1,858	13,607	624	*	1,006
Maputo Province	3,988	25,037	1,090	***	-15,216
Nampula	16,851	107,553	9,502		1,229
Naissa	7,614	27,007	5,432		1,630
Sofala	8,959	33,263	1,120		1,884
Tete	7,687	37,169	3,516		5,292
Zambezia	17,848	81,126	7,893		-7,180

*= significant at 5%; **=significant at 1%; ***=significant at 0.1%

Source: MEASURE DHS Project, ICF International, Washington D.C, and Census projection

Table 7: Trends in child marriage (before 18) between 1997 and 2011 (in % of girls aged 20-24), by province

Province	1997	2003	2011	Change % (1997-2011)	Change # (2003-2011)
Cabo Delgado	77.7%	73.2%	60.7%	*	-2,602
Gaza	46.2%	46.7%	41.0%		2,971
Inhambane	28.5%	49.7%	39.1%		-2,181
Manica	61.8%	60.7%	59.2%		13,807
Maputo Cidade	22.8%	20.9%	14.9%		-2,652
Maputo Province	82.3%	73.2%	62.3%	**	8,571
Nampula	70.3%	73.8%	55.7%		3,698
Naissa	14.1%	26.4%	25.6%		18,900
Sofala	66.3%	55.2%	49.4%	*	6,402
Tete	72.7%	57.8%	51.6%	***	12,052
Zambezia	53.5%	66.0%	47.1%		-8,162

*= significant at 5%; **=significant at 1%; ***=significant at 0.1%

Source: MEASURE DHS Project, ICF International, Washington D.C, and Census projection

In terms of adolescent pregnancies, the only provinces for which we found a statistically significant decrease at the 5% level were Inhambane and Maputo City. In all other provinces, the changes were statistically insignificant.

In Table 8 below, we have estimated change in the number of girls aged 20-25 having had a child, using 2007 census projections. According to these projections, we estimate that the only two provinces that achieved a reduction in the absolute number of adolescent pregnancies over the period 2003-2011 were Namplua (-6,493), Zambezia (-8,089). The province that saw the largest increase in the number of adolescent pregnancies was Tete, where the number of adolescent pregnancies increased by 4,278 between 2003 and 2011.

When looking at pregnancies before 18, we find that the rate of adolescent pregnancies increased in three provinces between 1997 and 2011. In one of these (Inhambane), the increase was statistically significant at the 5% level. However, the largest increase in the number of girls who had their first child before 18, was observed in Nampula (+27,052 between 2003 and 2011).

Table 8: Trends in adolescent pregnancies (first birth before 15) between 1997 and 2011 (in % of girls aged 20-24), by province

Province	1997	2003	2011	Change % (1997-2011)	Change # (2003-2011)
Cabo Delgado	11.5%	12.2%	11.4%		581
Gaza	1.2%	5.3%	2.8%		-851
Inhambane	1.1%	2.8%	4.9%	*	1,688
Manica	11.6%	13.7%	8.5%		-749
Maputo Cidade	0.2%	1.7%	2.8%		871
Maputo Province	10.3%	14.2%	8.1%		-6,493
Nampula	16.9%	18.7%	11.7%		-609
Naissa	0.2%	2.3%	5.4%	*	2,841
Sofala	8.1%	9.8%	10.1%		2,319
Tete	5.7%	5.2%	7.9%		4,278
Zambezia	11.9%	16.5%	8.8%		-8,089

*= significant at 5%; **=significant at 1%; ***=significant at 0.1%

Source: MEASURE DHS Project, ICF International, Washington D.C, and Census projection.

Table 9: Trends in adolescent pregnancies (before 18) between 1997 and 2011 (in % of girls aged 20-24), by province

Province	1997	2003	2011	Change % (1997-2011)	Change # (2003-2011)
Cabo Delgado	57.3%	46.2%	40.1%	*	-224
Gaza	39.0%	35.0%	32.9%		3,604
Inhambane	26.9%	38.0%	46.9%	*	9,565
Manica	43.7%	47.7%	44.9%		9,589
Maputo Cidade	22.6%	24.5%	20.5%		-994
Maputo Province	52.7%	48.7%	51.7%		27,052
Nampula	61.8%	65.0%	41.5%	*	-1,635
Naissa	21.7%	26.5%	33.9%		11,417
Sofala	52.1%	55.3%	37.5%	*	-4,172
Tete	39.8%	36.7%	38.2%		12,896
Zambezia	42.0%	54.1%	40.0%		-3,763

*= significant at 5%; **=significant at 1%; ***=significant at 0.1%

Source: MEASURE DHS Project, ICF International, Washington D.C, and Census projection

04 Determinants of child marriage and adolescent pregnancy

4.1 ANALYTICAL STRATEGY

4.1.1 THE FACTORS INFLUENCING CHILD MARRIAGE

The variables included in this model have been selected based on existing literature and suggestions from UNICEF Mozambique's child protection unit. Besides education of women, several other factors, that may be associated with child marriage, considered under the study are:

- **Age of head of the household:** Senior member generally have decision making power in the household such as marriage [7].
- **Sex of household head:** This is measured to test if the sex of the household head has any influence on child marriage.
- **Education of girls:** This variable considers the highest educational level attained in terms of no education, primary, secondary and higher [8]. There are at least two plausible hypotheses regarding the relation between girls' education and the age of marriage: (1) Educated girls get married later as they are more empowered; (2) Married girls are forced to abandon school earlier. Unfortunately, the model will not allow us to distinguish between these hypotheses, as the survey does not provide the date of school abandonment relative to the date of marriage.

[7] This variable is measured as continuous variable. We have considered the natural logarithm of age of household head in our model as there is non-linear relationship with marriage variable.

[8] Binary variables are constructed for each level of educational attainment for the study.

- **Education of the household head:** This variable comprises of no education, primary education, secondary education and higher along with 365 missing observations [9]. It is generally believed that more educated households are more aware of the risks associated with child marriage and may therefore be less inclined to marry their daughters at a young age.
- **Wealth:** Wealth signifies economic status of the household – higher the wealth, the better the chance of higher education for children and also greater access to media through possession of radio and television. Hence, wealth is highly correlated with higher education and access to media. Also, place of residence – urban and rural have high positive correlation. The model may underestimate the strength of wealth's association with child marriage if wealth, place of residence and education co-vary. Therefore, we have considered number of animals owned per household and cultivable agricultural land holdings (in hectares) as an indicator of economic status of the household. In Annex A.1 below, we have included the wealth quintile in the regression, while excluding land/ livestock ownership and other indicators which compose the wealth index.
- **Frequency of listening to radio:** Binary variables are constructed for the variable under study: = never listens to radio; 1= listens to radio.
- **Number of siblings:** This variable controls for the number of siblings of the responden [10].
- **Religion:** There are eight different religious groups namely – Catholic, Islamic, Zion, Evangelical/Pentecostal, Anglican, No religion, Protestant, and other. This variable is grouped under four major categories namely – Christian (includes – Catholic, Zion, Evangelical/Pentecostal, Anglican, Protestant), Islamic, no religion and others. No religion is considered as base.
- **Region:** In Mozambique there are 11 provinces namely – Niassa, Cabo Delgado, Nampula, Zambezia, Tete, Manica, Sofala, Inhambane, Gaza, Maputo Provincia, Maputo Cidade. We consider Maputo city as base for comparison while controlling for all other regions in the study.

4.1.2 THE FACTORS INFLUENCING OF ADOLESCENT PREGNANCY

Besides, the above determinants considered for study of child marriage, we consider the following additional variables for study of adolescent pregnancy.

- **Age gap:** The age gap considers the age difference between the women respondents and her husband / partners. The gap in age reflects minimum say in family decision by women and hence may positively influence pregnancy at early age [11]. In the regression analysis, we have controlled for both the 'age gap between women and husband/partners' as well as 'age of household heads'. The reasons we considered 'age of the household head' are (i) in most cases, head of the household is different from spouse/partners– 19 per cent of heads are not spouse for women in union; 34 per cent of head are spouse for women in union; 47 per cent of head are not spouse for women not in union; (ii) senior member of household may play a vital role on upholding the cultural traditions and practices in a family, which may influence early pregnancy.
- **Education of husband or partner:** For the education of the husband/partner we have considered the variable 'husband/ partner's educational levels. The variable comprises of no education, primary education, secondary education and higher education[12]. For respondents who are either never in union or widowed/ separated/divorced, this variables is recorded as missing. Hence, two additional dummy variables are constructed to adjust for the missing information: one for never in union and the other for widowed/ separated/divorced.
- **Number of co-wives:** The variable – 'Number of co-wives' – is measured as continuous in our analysis. Polygamy is the system of family organization in which a man has several wives at the same time. As is the case in many African countries, polygamy is practiced regardless of religion, ethnicity or socio-economic level of the people. Reference source not found. shows the average age of pregnancy for women with co-wives have slightly lower mean age of pregnancy (17.28) compared to women with no co-wives (17.39). Hence we test the overall significance of this variable by controlling it in the regression analysis.
- **Respondent participates in household decision:** Variable measures the weighted decision made by women in household.[13]
- **Use of contraceptives by women:** This variables comprises of four different categories of women – one who uses modern method; second, who uses traditional methods; third, who is non-user but intend to use later and finally, who does not intend to use. We considered dummy variables and the final category as base. Error! Reference source not found. Error! Reference source not found. shows women who use methods have average age of first birth at 17.6 years whereas those who do not use have average age of first birth at 17.37 years. However, women who used traditional methods have given birth at later age compared to those who used modern methods. Thus modern method seems to raise more early pregnancy than traditional methods. We introduce this variable in the regression analysis using dummy variables to test the significance of this prediction.
- **Respondent cannot ask for contraceptive to husband or partner:** The dummy variable is constructed for women who cannot ask for contraceptive use to husband/partners. There are 4789 missing values for this variable corresponding to those women respondents who were 'never in union or widowed or divorced or separated'. The dummy variables so constructed – one for never in union and the other for widowed/ separated/divorced are controlled in the regression analysis – to adjust for the missing information.

4.1.3 LIMITATIONS

Number of co-wives: we have omitted this variable in the study of child marriage because of the following two reasons – (i) 44.05 per cent of women in the age group 15-24 are in monogamous relationship with mean age of marriage 16.45. Only 6.09 per cent of women are in polygamous relationship with the mean age of marriage 16.46. Thus existence or non-existence of co-wives is not striking any difference in average age of marriage; (ii) this variable has 49.86 per cent of information either missing or don't know. [14]

Education of father and mother of women under study could not be controlled in the regression analysis due to data limitations.

Information on female teachers vs. male teachers could not be controlled due to data limitations: The DHS does not contain information on the gender of respondent's teachers at the age of marriage.

Violence: Variables related to domestic violence such as, forced in to unwanted sex and experience severe domestic violence, is available for half the sample interviewed – out of 13745 respondents, only 6835 are interviewed. Hence, inclusion of these variables will significantly reduce number of observation and the predictive power of the model.

There were large numbers of missing information for spouse related variables such as – husband/partner's age, husband/ partner's education, contraceptive use by husband and number of co-wives corresponding to those women respondents who were 'never in union or widowed or divorced or separated. The variable relating to domestic violence is available for half the sample as only half the sample has been interviewed. Therefore, we could not use violence related variables in our analysis. Given the data limitation, care has been taken to deal with these missing values cautiously. All variables are taken from the Demographic and Health survey 2011 (DHS) and are either taken directly from the survey results or are calculated by the author. The tables are generated using DHS survey 2011. All estimates are adjusted for weights and survey design. The statistical analysis software STATA is used for all estimations and analyses.

Educated girls get married later as they are more empowered; Married girls are forced to abandon school earlier.

[9] The education of household head is merged from household member record. The dummy variables corresponding to each level of education of head of the household is constructed.

[10] This is considered as a continuous variable in the regression.

[11] We have considered natural logarithm of the age gap variable to capture the non-linear relationship between age gap and age at first birth.

[12] The dummies are constructed for different levels of husband/partners' education. This variable also comprises of – 879 'don't know' cases and 2852 missing observations. We have recovered 209 observations for don't know or missing cases, from the household member record (DHS PR dataset 2011), using line number of the husband, and merged husband/partners' education information with the Individual record dataset.

[13] We considered the natural logarithm of this variable to capture the non-linear relationship.

[14] This is significantly reducing the goodness of fit in terms of pseudo-R2.

4.2 RESULTS

4.2.1 CHILD MARRIAGE

The dependent variable for child marriage is a binary variable constructed with two age cut-offs i.e. that takes the value 1 if the respondent was married before 15/ before 18, and 0 otherwise. When using binary outcome variables, the appropriate statistical model to use is called a probit regression, which estimates the probability that a girl will get married before 15/ before 18 based on her characteristics. In order to obtain the nationally representative coefficients and standard errors in the model under consideration, the probit regression analysis is adjusted for weights and survey design and the results are presented in Table 10.

It should be noted that it was particularly difficult to adequately model the causes of marriage before 15, due to the small number of girls in the sample who got married before that age. This is due to the fact that the DHS was not specifically designed to study the problem of child marriage before 15, which affects a relatively small number of girls. Consequently, the model for marriage before 15 has a poor fit, explaining less than 10% in the overall variation in the age of marriage and having very few significant coefficients among the explanatory variables. In order to improve the explanatory power of the model, a purpose-made survey would be required that over-samples girls under 15 so as to ensure that there are sufficient observations in the sample. By contrast, the model explaining marriage before 18 explains a respectable 14% of the overall variation in marriage age, with more significant explanatory factors.

Even after controlling for differences between provinces and other factors, we find that the rates of child marriage (before 15 and 18) are significantly lower among the following groups: (i) girls with secondary and higher education, (ii) girls from households with older heads of households; and (iii) girls from households that own land. Although the present study does not allow us to assert the direction of causality, it is reasonable to assume that in the first of these cases, the causality runs from marriage to education, rather than the other ways around (see section 5 below).

Furthermore, we find that girls from households headed by women[15] have a significantly lower probability of being married before 18, whereas girls living in rural areas and girls living in households that own livestock are slightly more likely to get married before 18. Primary education is associated with a higher probability of being married before 18 compared to girls with no education, but with a slightly lower probability of being married before 15.

Table 10: Probit regression for age at first cohabitation below 15/18 years within specified age groups.[17]

Independent Variables	Marriage <15 (age 15-24)	Marriage <18 (age 18-24)
Age of household head (ln)	-0.42 ***	-0.69 ***
Male household head	0.08	0.26 ***
Women primary education	-0.08	0.20 **
Women secondary education	-0.84 ***	-0.53 ***
Head's primary education	-0.07	-0.07
Head's secondary education	-0.02	-0.16
Rural	-0.03	0.07
Frequency of listening to radio	-0.03	-0.07
No. of siblings	-0.01	0.01
Animals owned in household	0.00	0.0001
Land owned by household	-0.002 ***	0.00
Christian	-0.06	-0.21 **
Islamic	-0.18	-0.49 ***
Other	-0.27	-0.31 *
North	0.46 ***	0.64 ***
Centre	0.29 ***	0.30 ***

[15] This is visible from the fact that the dummy variable for male head of household has a significant positive effect on the probability of being married before 18.

[16] Comments received during the presentation of initial results point to the fact that very few individuals in Mozambique would describe themselves as non-religious. Consequently, participants suggested that families classified as non-religious were more likely to be families that refused to answer or who belonged to other traditional religions.

[17] *** denotes a p-value < 0.01; **denotes p-value<.05; * denotes p-value<0.1. Sample size: 5145, standard error adjusted for 609 clusters, pseudo R2 =0.0841 for marriage below 15. Sample size 3306, standard error adjusted for 602 clusters and pseudo R2 = 0.1376 for marriage below 18. Richest wealth quintile and southern regions are considered as base.

Girls from religious households (Muslim, Christian or other) have a significantly lower probability of being married before 18, compared to girls who declare no religion[16]. Importantly, this is after controlling for social and economic differences between religious groups, such as the fact that households with traditional religions tend to be poorer and have less education than other households. However, when compared to households classified as "other religions", Muslim and Christian girls actually have a slightly higher, but statistically insignificant, probability of entering into child marriage, which is consistent with the findings of other existing studies in Mozambique (see, for instance, Saranga & Kurz, 2007).

When we consider wealth quintiles, the incidence of child marriage below age 18 is significantly higher in the third and fourth quintiles – middle and richer – compared to the richest quintile (see Annex A.1 below).

4.2.2 ADOLESCENT PREGNANCY

We have constructed two binary variables for pregnancy under two early age cut-offs i.e. (i) pregnancy before age 15 and (ii) pregnancy before age 18. These variables are constructed using age at first birth and have adjusted for women who are currently pregnant and those who terminated their pregnancy before age 18. When using binary outcome variables, the appropriate statistical model to use is called a probit regression, which estimates the probability that a girl will get pregnant before 15/ before 18 based on her characteristics.. In addition, the use of a binary variable enables us to make comparison with respect to each cut-offs - (i) pregnancy below age 15 versus 15 and older; and (ii) pregnancy below age 18 versus 18 and older. In order to obtain the accurate standard errors in the model under consideration, the probit regression analysis is adjusted for weights and survey design and the results are presented in Table 16.

As in the case of child marriage, we find that girls with secondary education have a significantly lower probability of getting pregnant before 15 and 18, and that the probability of being married before 18 decreases with the age of the head of household. Importantly, this result holds even after controlling for the girl's marital status, as well as other control variables, such as geographic location, etc.

A significant factor in the case of adolescent pregnancy appears to be the girls' empowerment in reproductive health. In particular, we find that girls that cannot ask their husband/ partners for contraceptive use have a significantly higher probability of getting pregnant before 15.

Frequency of listening to radio significantly reduces the probability of getting pregnant before 15, but does not have a statistically significant effect on pregnancy before 18. Girls living in urban areas have a significantly higher probability of getting pregnant before 15 than girls living in rural areas, after controlling for all other differences[18]. However, we do not find any significant relation between wealth and adolescent pregnancy (refer to Annex A.1 below).

Table 11: Probit regression for teen pregnancy below 15/18 years within specified age groups[19]

Independent Variables	Pregnancy <15 (age 15-24)	Pregnancy <18 (age 18-24)
Ln Age gap	0.03	-0.08
Age of household head (ln)	0.18 *	-0.14 *
Male household head	-0.07	-0.07
Women primary education	-0.06	0.11
Women secondary education	0.38 **	0.34 ***
Husband/Partner primary education	0.09	0.10
Husband/Partner secondary education	0.03	0.21
Head's primary education	-0.02	-0.06
Head's secondary education	-0.08	-0.18
Rural	-0.22 **	0.04
Frequency of listening to radio	-0.17 **	0.04
No. of siblings	0.01	0.00
No. of co-wives	0.11	0.02
Number of animals owned in household	-0.0003 *	0.00 ***
Land owned by household (in hectare)	-0.0005	0.00
Respondent takes household decision	-0.13	0.06
Respondent can't ask for contraceptive use to husband	0.15 *	0.02
Respondent use modern methods of contraceptive	0.17	0.07
Respondent use traditional methods of contraceptive	-	-0.68
Respondent don't use but intend to use contraceptive later	-0.08	0.04
Christian	-0.03	-0.10
Islamic	0.20	-0.15
Other	-0.15	-0.25
North	0.05	0.07
Centre	0.18 *	-0.10
Never married	-0.95 ***	-0.70 ***

[18] There is a negative and significant coefficient on the dummy for girls living in rural areas, meaning that the probability is higher for girls living in urban areas.

[19] *** denotes a p-value < 0.01 ; ** denotes p-value<.05; * denotes p-value<0.1. Sample size: 5045 standard error adjusted for 609 clusters. Pseudo R2 =0.1069. Sample size: 3346 standard error adjusted for 601 clusters. Pseudo R2 =0.0704. Southern regions are considered as base.

05 Impact of child marriage and teen pregnancy

This chapter investigates these relationships in the Mozambican context, using data from the *Demographic and Health Survey 2011(DHS 2011).* It establishes the relationships associated with child marriage and teen pregnancy by investigating three outcome areas:

1. **Attainment of schooling,** by looking at the likelihood of finishing primary school and starting secondary school and how this differs by child marriage and teen pregnancy measures
2. **Child health,** by looking at the malnutrition level and likelihood of death for children under the age of five and how this varies by child marriage and teen pregnancy measures
3. **Maternal health,** by looking at the likelihood of a woman's having a medical specialist present at a birth and women's recent fertility(both of which are known correlates with maternal health and likelihood of maternally related death) and how these differ by child marriage and teen pregnancy measures

Care has been taken to model these relationships controlling for other factors that may influence the outcome variable, so as to isolate the direct relationship between a girl's marrying or having children early and the outcome.

The details of the analysis are provided below. Section 5.1 outlines each of the variables used in our estimations and also documents any issues with these or differences in interpretation from the *DHS 2011* report. Section 5.2 outlines the modelling strategy that was used for each of the outcome variables. An outline of the data and strategy used for the controlled estimations is provided in Table 19 below. The results and analysis are presented in Section 5.3.

5.1 DATA DESCRIPTION

All variables used in this section are taken from the Demographic and Health Survey 2011 and are either taken directly from the survey results or calculated by the author. The following provides the precise definition for each of these and summary statistics for the dependent and interest variables. All reported figures are survey adjusted.

5.1.1 OUTCOME VARIABLES

The outcome variables in the analysis were identified by UNICEF and fall into three categories

1. schooling outcomes for the woman,
2. health outcomes for her children and
3. mother's health outcomes when having children.

The following outlines how each of these outcomes is measured and provides summary statistics to put the variables in context for the later analysis.

SCHOOLING OUTCOMES – FINISHING PRIMARY AND BEGINNING SECONDARY

The schooling outcome variables are binary measures of whether the respondent

1. at least finished the seventh year of primary school, and
2. at least started the first year of secondary school

These categories are continuous in order, meaning there is no group who went beyond primary school who did not at least start secondary. Table 12 shows the proportion of respondents who finished primary and started secondary school disaggregated by gender, province and age group.

Table 12: % of all respondents who reach levels of schooling by gender, province and ten year age group

	NUMBER OF OBS.		FINISH PRIMARY SCHOOL		START SECONDARY SCHOOL	
	Female	Male	Female	Male	Female	Male
Total	13,745	3,511	24.4	39.5	16.9	26.7
Province						
Niassa	927	239	18.6	33.6	11.8	19.9
Cabo Delgado	1,047	376	11.2	23.2	6.9	13.9
Nampula	980	299	15.9	36.1	9.9	21.2
Zambezia	1,330	356	10.2	25.5	6.6	16.2
Tete	1,126	337	15.3	25.1	11.0	18.3
Manica	1,174	308	36.3	58.5	23.9	40.4
Sofala	1,615	404	24.9	45.2	17.1	32.2
Inhambane	1,139	173	27.3	51.8	17.6	34.6
Gaza	1,259	203	29.4	36.3	20.0	23.8
Maputo Province	1,424	387	52.1	69.0	37.2	47.2
Maputo City	1,724	429	65.5	79.1	51.6	62.7
Age group						
15-24	5,537	1,515	35.7	46.4	23.6	31.4
25-34	4,360	1,040	21.3	38.0	15.7	27.6
35-44	2,814	705	13.5	29.5	9.5	17.6
45-49	1,034	251	8.0	32.9	6.6	20.2

*= significant at 5%; **=significant at 1%; ***=significant at 0.1% •Note: All proportions are adjusted for survey structure

Source: MEASURE DHS Project, ICF International, Washington D.C, and Census projection.

CHILD HEALTH OUTCOMES – CHILD DEATH AND MALNUTRITION

The child health outcomes are measured for the children born to female survey respondents up to five years prior to the interview[20]. Hence, we have a sample of living and deceased children, all of whom are aged, or were aged when they died, between 0 and 59 months old.

The outcomes measured for this group are the raw child death rate, measured by the binary variable:

1. whether the child is currently alive[21]

Infant malnutrition is measured for currently living children by the child's height for age ratio in standard deviations away from the mean in the World Health Organisation's (WHO) guidelines. Malnutrition is thus analysed in two ways, using

2. the height for age[22]

3. an indicator for whether the child exhibits stunting[23]

A number of variables that indicate aspects of malnutrition are available in DHS 2011. The main ones are weight for age (wasting), height for age (stunting) and weight for height (underweight). Stunting was chosen to align with the concurrent report on Chronic Malnutrition[24].

Sample averages for each of these indicators over the relevant group (all children and all living children) are reported in Table 13, disaggregated by province and the child's gender.

There is significant variation between provinces and genders in these outcome variables. Low height for age is highly prevalent in Mozambique as a whole compared to the WHO distribution, with average deviations from mean at -1.68 and 42.6% of children exhibit stunting. The incidence of stunting varies across provinces, although the rates are relatively high even in the least effected (Maputo Province and City) and stunting affects the majority of infants in the worst effected (Cabo Delgado and Nampula).

Similarly, the raw child death rate differs between provinces, however in this case the Southern provinces are closer to the national average and the North-Eastern provinces have lower rates. The range between provinces is quite high, with the rate in the worst effected, Tete, doubling that in the least effected, Inhambane.

Table 13: Averages in child health outcomes by province and gender, for children born within 59 months prior to survey

	Raw death rate (per 1,000 births)	Height for age s.d. from WHO mean (units)	Stunting % children with height for age <-2 s.d. from WHO mean
Obs.:	11,102	9,313	9,313
Total	74.3	-1.68	42.8
Province			
Niassa	58.9	-1.79	46.8
Cabo Delgado	54.3	-2.07	52.8
Nampula	51.8	-2.12	55.3
Zambezia	89.5	-1.71	45.2
Tete	101.6	-1.70	44.2
Manica	79.4	-1.63	41.9
Sofala	79.0	-1.44	35.7
Inhambane	49.3	-1.55	36.0
Gaza	76.9	-1.25	26.8
Maputo Province	68.9	-1.15	22.7
Maputo City	70.6	-0.99	23.2
Child's gender			
Male	78.6	-1.77	44.7
Female	70.0	-1.60	40.5

Notes: all figures survey adjusted

Source: Author's calculations from DHS 2011

[20] Note that each respondent may show up as the mother of none or many children because all children born within five years are captured in this set; this fact should not bias our results at all, given the respondents were accurately sampled and we have no reason to believe women who gave birth in the last five years are any different from those who did not.

[21] In this study, we use raw child death rates, rather than under 5 mortality rates. The difference between these two indicators, is that the raw child death rate is not adjusted for the standardised probability of dying by age group and is therefore not directly comparable to the official under 5 mortality figure for Mozambique. However, differences in the age of the child are taken into account in our regression when estimating the impact of the variable of interest on the probability of a child dying.

[22] This is a continuous variable calculated as the standard deviation from the WHO reference distribution.

[23] Stunting is defined as having a height-for-age that is at least 2 standard deviations below the WHO reference distribution. This is a binary indicator.

[24] Silva-Leander (2014) "Situation Analysis Mozambique: Multivariate regression analysis on chronic malnutrition (DHS 2011)", Oxford Policy Management, April 2014.

MATERNAL HEALTH OUTCOMES – PRESENCE OF A SKILLED ATTENDANT AT BIRTH AND FERTILITY

An initial goal of this study was to investigate the relationship between child marriage and childbirth and maternal mortality. Unfortunately due to characteristics of the available data, no meaningful models were estimable to investigate these relationships. Instead we look at two variables that are known to relate to maternal mortality and maternal health in general, the presence of skilled attendants at births and female fertility, as a proxy for the desired measure. The replacement variables were chosen by UNICEF based on available evidence.

The presence of a skilled attendant at the birth of a child is measured for each child born up to 59 months prior to the interview by the binary variable for

4. whether a doctor, nurse, birth attendant, or any of three other health professionals assisted at the delivery of the child

Fertility is measured for each respondent aged 15-49 by the continuous variable for

5. the number of children born to the respondent in the three years (1-36 months) prior to the survey

Note that this is a slightly different definition of fertility than that found in *DHS 2011*, because it does not adjust for 'women-years of exposure' in different age groups. This report is interested in estimating the number of children over three years per woman based on our interest variables, whereas *DHS 2011* estimates aggregate fertility rates among age groups of women. Although we will present results disaggregated by age, there is a subtle difference in interpretation: our figures report the average number of children born in the last three years to women *who are aged within the ten year age groups at the time of survey,* in contrast *DHS 2011* reports the average fertility rates for women *when they are at different ages* (so one woman can contribute data to two age groups). This simplification was necessary to allow controlled model estimation.

There is considerable variation between the provinces in rates of skilled attendant use. Fully 90.8% of births in Maputo City had a skilled attendant present whereas only 26.4% had one present in Zambezia and there is much variation in between. Likewise fertility rates differ over provinces, with the Southern provinces of Inhambane, Gaza and Maputo Province and City having much lower levels of fertility than the Central and Northern provinces.

Fertility patterns differ with age of the mother as expected – they are highest for women aged 25-34 and diminish quickly after that. The presence of skilled attendants at birth is more likely for the youngest mothers and diminishes with age thereafter, perhaps reflecting increases in experience and therefore perceived less need for assistance.

Table 14: Averages in maternal health outcomes by province and relevant ten-year age group

	% births with skilled attendant present[1]	Average number of children born 3 years prior to survey per woman[2]
Obs.:	11,102	13,745
Total	54.3	0.52
Province		
Niassa	60.5	0.65
Cabo Delgado	35.4	0.61
Nampula	55.3	0.54
Zambezia	26.4	0.57
Tete	51.7	0.59
Manica	74.0	0.55
Sofala	71.1	0.51
Inhambane	59.4	0.44
Gaza	71.1	0.47
Maputo Province	84.0	0.38
Maputo City	90.8	0.29
Age group[3]		
15-24	58.9	0.50
25-34	53.2	0.71
35-44	45.2	0.44
45-49	36.8	0.12

Notes: all figures survey adjusted

Source: Author's calculations from DHS 2011
[1] Per birth, among all births 0-59 months prior to survey.
[2] All births 1-36 months prior to survey; per woman, among all female respondents.
[3] This is age group of mother at birth for '% with skilled attendants' and at interview for 'average children born'

Table 15: % of children born to mothers in five years prior to survey by province, child marriage status and mother's age at birth

			MOTHER'S AGE GROUP AT BIRTH OF CHILD				
	N	Married before 18	<18	18-24	25-34	35-44	45+
Total	11,102	50.2	7.5	37.0	39.4	15.1	1.2
Province							
Niassa	953	53.7	6.0	36.7	41.2	15.3	0.8
Cabo Delgado	972	57.9	7.2	34.8	39.8	17.3	0.9
Nampula	872	57.4	9.1	38.6	37.5	14.0	0.8
Zambézia	1,324	44.8	6.0	31.1	41.1	19.9	2.0
Tete	1,078	53.4	7.7	38.5	37.8	14.0	1.9
Manica	1,096	62.1	8.6	44.5	36.6	9.7	0.6
Sofala	1,336	52.5	8.1	36.0	38.8	15.3	1.8
Inhambane	827	49.0	6.4	35.2	43.7	14.2	0.5
Gaza	969	43.2	7.7	40.5	39.7	11.9	0.2
Maputo Province	852	33.7	8.3	39.4	40.2	12.1	0.1
Maputo City	823	23.7	7.2	44.5	37.3	10.7	0.4

5.1.2 INTEREST VARIABLES

The variables of interest in this chapter are child marriage and adolescent pregnancy. For the purpose of this specific study, the variables of interest have been coded as follows, in order to create mutually exclusive groups:

1. The respondent was first married/ pregnant aged under 15
2. The respondent was first married/ pregnant aged between 15 and 18
3. The respondent was not married/ pregnant before age 18

This is necessary so that the different groups can be modelled together in the same regression, in order to avoid omitted variable bias.

The dataset is limited to the children of survey respondents who were born less than 60 months before the survey. Because of this, there are very few observations of very early (<15) teen pregnancy or marriage, particularly at provincial level. Hence, for the analyses relating to infant mortality and malnutrition, the interest variables are categorical measures of

- the mother's age at birth of the child in age bands that combine the two teen categories with other ten-year groups (less than 18, 18-24, 25-34, 35-44 and 45-49)
- whether the mother was married aged under 18

The proportion of all children born to mothers in the five years before the survey are reported in Table 15 below, disaggregated by province, child marriage status and age group of the mother. The proportions born to mothers in the adolescent (<18) category are much smaller than the other categories, as one would expect – though many women may give birth to their first child under the age of 18, they are likely to have other children as well, and most of these at ages over 18; hence, given our survey is a snapshot of the past five years, there is no reason to expect high proportions of births to mothers under age 18.

5.1.3 CONTROL VARIABLES

We estimate the impact of interest variables on the outcome variable using two different models. The first reports simple averages for different groups adjusted for survey structure and the latter report the same, controlling for various factors that are also likely to influence the dependent variables. These controls are detailed here in different sets – the 'common' set is included in all controlled models and the specific sets outlined below are included where relevant.

5.1.3.1 COMMON CONTROL VARIABLES

The common set of controls, included in all regression analyses is outlined in Table 16. These are a standard group of variables that control for differences in wealth, opportunity, attitudes within the home and spatial factors.

5.1.3.2 MODEL SPECIFIC CONTROL VARIABLES

SCHOOLING OUTCOMES

The schooling outcomes regressions use the common set as well as the 'schooling set' that contains

- a binary variable indicating the gender of the respondent
- a continuous variable for age, and
- a continuous variable for the square of age

CHILD HEALTH OUTCOMES

The 'child set' variables are outlined in Table 17; these are controls for the child's characteristics, breastfeeding status and health, both currently and at birth.

The 'mother set' variables are outlined in Table 18; these are controls for the mother's education levels and health, her birth history and her involvement in decisions within the home.

MATERNAL HEALTH OUTCOMES

The maternal health outcomes regressions both use the common set of controls only. The regressions on fertility (children born in the last three years) exclude the common control 'total number of children' as this is highly related to the dependent (in an uninformative way), particularly for lower age groups.

Table 16: Control variables - common set

Variable name (data type)	Meaning or categorical values
Total children (continuous)	The number of children ever-born to the respondent
Log wealth (continuous)	The natural log of the household wealth factor score
Gender of household head (binary)	Male, Female
Schooling attainment for household head (categorical)	No education, Incomplete primary, Complete Primary, Incomplete secondary, Complete secondary, Higher, Don't know
Religion (categorical)	Catholic, Islamic, Zion, Evangelical/Pentecostal, no religion, other [26]
Location (categorical)	Urban, Rural
Province (categorical)	11 provinces

Table 17: Control variables - child set

Variable name (data type)	Meaning or categorical values
Gender of child(binary)	Male, Female
Log age of child(continuous)	Natural log of the child's age in months
Size of the child at birth (categorical)	Very small, Smaller than average, Average, Larger than average, Very large, DK coded as the median for similar households by wealth, region and type of residence
Child's anaemia level(categorical)	None, Moderate, Severe, Not measured
Child had fever in last two weeks (binary)	Yes, No
Child had diarrhoea in last two weeks (binary)	Yes, No
Child had a cough in last two weeks (binary)	Yes, No
Log times ate solids(continuous)	Log of times ate solid foods in past 24hr or types of solids eaten if currently breastfeeding
Vitamin A supplements (Binary)	Whether the child received vitamin A supplements in 6 months preceding interview
Log total vaccines (Continuous)	Natural log of the number of vaccines the child has received
Child has received 3 DPT vaccines (binary)	Whether the child has received 3 doses of dpt/penta vaccine, with NA/DK coded as no vaccine
Child's breastfeeding status (categorical)	Breastfed exclusively, Only plain water, Not exclusively breast-fed, Not currently breastfed, Never breastfed
Child received complementary food in last 24 hours (categorical)	No breast or no food, Breast and food, Not applicable

Table 18: Control variables - mother set

Variable name (data type)	Meaning or categorical values
Mother's highest level of schooling	No education, Incomplete primary, Complete Primary, Incomplete secondary, Complete secondary, Higher, Don't know
Mother's literacy level(categorical)	Cannot read at all, Able to read only parts of sentence, Able to read whole sentence, No card with required language, Blind/ visually impaired
Mother's anaemia status (categorical)	None, Mild, Moderate, Severe, Not measured
Log of mother's height (continuous)	Natural log of the height of the mother in cm
Log birth spacing (continuous)	Natural log of number of months between this birth and the last
Log antenatal visits(continuous)	Log of number of antenatal visits by mother for most recent birth
Recent antenatal visits were at medical facility (categorical)	No medical visit (inc. no response), At least one medical visit, NA/DK, Not last born
Mother participates in health decisions	Yes, No
Log number of decisions made	Natural log of the number of weighed decisions were made by mother

[26] Religions with less than 5% representation in the sample are included in 'other' to alleviate perfect prediction issues in regressions.

5.2 MODELLING STRATEGY

5.2.1 DATA RESTRICTION

The questions relating to first marriage and pregnancy are recall questions asked to all women between the ages of 15 and 49. This creates some specific constraints, as we are interested in contemporary relationships. Although we expect to find relationships between, say child marriage and schooling outcomes, we also expect these to have changed over time – due to generational shifts, policy following the Millennium Development Goals and other factors such as the civil war. Given this, it is necessary to restrict the datasets used for analysis where the structure of the data does not allow identification within the model.

This need arises from one of two scenarios:

1. The dependent variable's outcomes are not located in time (e.g. schooling attainment could have happened any time in the past whereas all births data is for the last 59 months).
    a. Present for: Finished primary school, Started secondary school models
2. The interest variable's outcome is separated by the dependent by a long time (e.g. 45 year old women who were married under fifteen and had a child a year before the survey)
    a. Present for: Child marriage impact on Child malnutrition, Child mortality, Skilled attendant present at birth and Fertility models

We respond to both scenarios by restricting the dataset used in the analysis. To respond to the first, we conduct the whole analysis on the pool of respondents aged less than 30 years at the time of survey. To respond to the second we conduct the analysis on the full pool of respondents and report marginal results calculated on the pool of respondents aged less than 30 at the time of survey. The age '30' was chosen to strike a balance between finding contemporary relationships and having a large enough sample size to render meaningful results.

Table 19: Summary of modelling strategy used in controlled estimations

Outcome	Finishing primary school	Starting secondary school	Child malnutrition	Child mortality	Skilled attendant present	Fertility
Subject	Survey respondent	Survey respondent	Children born to survey respondent	Children born to survey respondent	Births to survey respondent	Survey respondent
Sample	All under 30	All under 30	All within 5 years of survey	All within 5 years of survey	All within 5 years of survey	All women
Dependent variable	Whether finished primary	Whether started secondary	Height/age s.d. and whether stunted	Whether alive	Whether skilled attendant present at birth	# children born three years prior to survey
Estimation model	Probit	Probit	OLS and Probit	Probit	Probit	Tobit
Interest variable: child marriage	First union before 15 or 15-17	First union before 15 or 15-17	First union before 18	First union before 18	First union before 18	First union before 15 or 15-17
Interest variable: adolescent pregnancy	First child before 15 or 15-17	First child before 15 or 15-17	This child before 18	This child before 18	This child before 18	First child before 15 or 15-17
Controls used	Common + Gender	Common + Gender	Common + Child + Mother	Common + Child + Mother	Common	Common - Total children

5.2.2 MODELS

Each outcome area is analysed using uncontrolled (simple averages) and controlled models. The first shows the average outcome disaggregated by the interest variables. Using just these results would misrepresent the relationships if there are other factors related to or influencing the interest variables that also have bearing on the outcome. For example, we could observe that women who married early tend to finish primary school less frequently than others, but this could be because early married women tend to come from poorer families which both remove their daughters from school and marry them off to reduce the burden on the family. Hence, the relationships estimated in controlled models are closer to the true relationships, assuming that the correct controls are included.

The modelling approaches were chosen to be simple and appropriate to the nature of the dependent variable.

1. The uncontrolled estimates are the survey adjusted sample averages for the identified groups, they were produced in the statistical software STATA using a simple linear regression, called Ordinary Least Squares, with the interest variable as the only explanatory variable; other models produce identical results. All estimates are survey set with the parameters outlined in Rutstein and Rojas's Guide to *DHS Statistics* (Sept. 2006), p.14.
2. The controlled estimations use different models, determined by dependent variable[27], they are:

- Finish primary school: probit model (binary dependent)
- Start secondary school: probit model (binary dependent)
- Height for age standard deviations: OLS (continuous dependent)
- Stunting: probit model (binary dependent)
- Child mortality: probit model (binary dependent)
- Skilled attendant present at birth: probit model (binary dependent)
- Fertility: Tobit model (continuous dependent that must be zero or positive)

All estimations were produced using STATA and are survey set with the parameters outlined in Rutstein and Rojas's *Guide to DHS Statistics* (Sept. 2006), p.14.

The results section presents the estimated relationships between each of the dependent variables and our interest variables in a way that makes them easily comparable to the uncontrolled estimates. The pure regression results for each model are reported in Annex A.

Reported results from the controlled models are produced by computing average marginal effects: the predicted impact of the independent variable on the dependent variable from a defined base state is calculated for each respondent (or the limited pool where relevant) and averaged[27]. We can use this method to compute both estimated incidences of a variable in some base state or changes away from the base after a change in one interest variable.

Each model is estimated for the nation of Mozambique as a whole and for each of the three groupings of provinces into

1. the Northern Region, which comprises Niassa, Cabo Delgado and Nampula
2. the Central Region, which comprises Zambezia, Teta, Manica and Sofala
3. the Southern Region, which comprises Inhambane, Gaza, Maputo Province and Maputo City

5.2.3 LIMITATIONS

Causation is not identified. The controlled estimates improve on simple averages by separating relationships with other factors from the relationship with the interest variable. The result is a better estimate of this relationship but does not identify causation (the dependent may cause the interest variable or something else may yet cause both). This is less of an issue where reverse causation is impossible or unlikely (for example a baby's dying could not influence the mother's age at its birth) or there are other reasons to think the relationship is directly causal (for example there may be physiological reasons for higher infant mortality rates among young mothers).

The order of events is not guaranteed. This issue applies to the schooling outcomes models. We would ideally like to see the change (or not) in school attendance as a result of child marriage or pregnancy. Identifying such relationships would require data on school attendance and grade prior to and after a child marriage or pregnancy. The DHS 2011 records the highest level of schooling achieved at time of interview and whether the respondent is attending school in that year. Hence, we cannot identify the direct relationship. The results we do have, therefore, must be interpreted as showing joint tendencies – those who marry before age 15 are also 12% per cent less likely to finish primary school – rather than a direct link – marrying before the age of 15 reduces the likelihood of finishing primary school by 15%.

[27] The models were tested for functional form misspecification using a RESET test for OLS and classification tables for probit. The results were checked by the author but are not reported here.

[28] It is always necessary to use this method in probit models, where the coefficients do not have an immediately useful interpretation, or tobit models where raw results can give nonsensical outcomes (negative children), but average marginal effects are a useful way to compute testable results from OLS models with interacted interest variables as well.

5.3 RESULTS

5.3.1 FINISHING PRIMARY SCHOOL

The summarised results are presented in Table 20 and the full probit estimations are reported in Table 33 in Annex A.2.

INTERPRETING RESULTS

The summarised results table reports the uncontrolled and controlled statistics for women for each interest variable by giving

- **Base Likelihood:** the estimated likelihood of finishing primary school for the base group (where the interest variable is set at the 'neither' category)
- **Impact:** the estimated difference from base likelihood of finishing primary school associated with that particular interest variable

For example, in the uncontrolled estimate 41.8% of women in the sample who were not married before age 18 are estimated to have finished primary school. This figure reduces by 27.7% for women who were married before 15; so for this group, only 14.1% are estimated to have finished primary school.

RESULTS

- Women who marry early finish primary school less frequently than those who don't. This effect is robust to controls, although not as strong.
- Women who marry before 15 finish primary school less frequently than those who marry between ages 15 and 18. This is as expected because the later marriage age gives the girls more opportunity to continue with schooling.
- The relationship between child marriage and finishing primary school differs by region. The effect is strongest and most statistically significant in the Southern region, presumably because rates of schooling attainment are highest here and so the difference between women who marry early and those who don't are more pronounced.
- The apparent effect of having children early is not robust to controls. Women who have children early appear to finish primary school early when no controls are used but the precision and magnitude of these estimates dramatically reduces when controls are introduced, suggesting the main thing keeping girls out of school is marriage.
- These effects are no different for boys who marry and have children early. There is a systematic gender bias that leads to boys getting more education generally, but their access to education also reduces if they are early married or become early fathers and there is no further significant difference between boys and girls due to these factors.
- In all cases, introducing controls reduces the magnitude of the estimated relationship with interest variables. Various controls have significant relationships with the likelihood of finishing primary school. Higher likelihood of finishing is associated with being older (which effect weakens the older you get), having fewer children, being wealthier, having a female head of household with higher levels of education herself, being Catholic and living in an urban area.

Table 20: Likelihood of finishing primary school for women under 30 by child marriage or teen pregnancy groups – national and regional

		Simple averages (%)		With controls (%)	
Interest (x)		**Marriage**	**Pregnancy**	**Marriage**	**Pregnancy**
National					
Base		41.7	37.2	35.0	32.7
Difference	*x <15*	*-27.9****	*-21.2****	*-21.6****	*-5.3*
from base	*14 <x <18*	*-19.5****	*-12.7****	*-5.4****	*+0.5*
N		9,924		9,914	
Northen Region					
Base		27.8	23.1	23.8	20.6
Difference	*x <15*	*-16.4****	*-11.1****	*-12.0****	*+3.3*
from base	*14 <x <18*	*-10.5****	*-3.9*	*-3.7*	*+1.0*
N		2,121		2,121	
Central Region					
Base		31.0	28.2	28.4	26.1
Difference	*x <15*	*-18.0****	*-12.2****	*-7.9**	*-4.0*
from base	*14 <x <18*	*-10.4****	*-7.6****	*-4.1**	*+3.0*
N		3,969		3,961	
Southern Region					
Base		64.7	63.5	59.6	58.1
Difference	*x <15*	*-40.5****	*-38.8****	*-19.9***	*-16.4**
from base	*14 <x <18*	*-29.2****	*-23.7****	*-47.1***	*-1.1*
N		3,834		3,832	

Notes: *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. Base is average estimated likelihood with interest variables turned off, changes are average marginal effects of turning on a single interest variable at a time. All estimates survey set.

The finding that adolescent pregnancy is not significantly related to finishing primary school once child marriage and other factors are controlled for is surprising. We considered the possibility that a lack of observations of out-of-wedlock births was clouding our data (there being not enough variation to estimate separate effects of childbirth and marriage separately). A quick analysis showed, however, that there are substantial out-of-wedlock births so this should not, in fact, be a problem. To further check the veracity of this finding, the analyses were run again without the marriage control to see if the close relationship between marriage and childbirth was clouding results, however we found that even with this exclusion adolescent pregnancy was at best marginally significant (p<0.10) and then only for women who bore children aged between 15 and 18. Hence we are confident that the finding that finishing primary school is related to child marriage and various other factors, but not adolescent pregnancy, is robust.

Women who marry before 15 finish primary school less frequently than those who marry between ages 15 and 18.

5.3.2 STARTING SECONDARY SCHOOL

The summarised results are presented in Table 21 and the full probit estimations are reported in Table 34in AnnexA.2.

INTERPRETING RESULTS

The summarised results table reports the uncontrolled and controlled statistics for women for each interest variable by giving

- **Base Likelihood:** the estimated likelihood of finishing primary school for the base group (where the interest variable is set at the 'neither' category)
- **Impact:** the estimated difference from base likelihood of finishing primary school associated with that particular interest variable

For example, in the uncontrolled estimate 30.2% of women in Mozambique who were not married before age 18 are estimated to have finished primary school. This figure reduces by 24.5% for women who were married before 15; so for this group, only 5.7% are estimated to have finished primary school.

RESULTS

- Women who marry early start secondary school less frequently than women who don't. This relationship is robust to controls at the national level and at the regional level as well for girls who marry before 15.
- The relationship with being married between 15 and 18 differs by region: in the Northern and Central regions, the relationship's magnitude is much diminished in the presence of controls (going from 9.7 and 9.0% down to 3.8 and 2.6% respectively) and is not significantly different from zero in the Central region. By contrast, the relationship is strong in both magnitude and significance in the Southern region, although less so after controls.
- Women who have children early appear to finish school less frequently than those who don't but this effect is not robust to controls. When other factors are introduced, the effect of early pregnancy cannot be precisely estimated and we cannot be sure it is different from zero. This is reflective of the finding for the likelihood of finishing primary school.
- Child marriage and children do not affect girls' and boys' starting secondary school differently. After controlling explicitly for the (large and statistically significant) gender bias in educational attainment regardless of child marriage and children, and recognising the much higher incidence of child marriage and children on girls, there is no difference in the association of child marriage with lower secondary starting rates between the genders.
- As with the primary results, higher likelihood of starting secondary school is significantly related to being older, having fewer children, being wealthier, having a female head of household with higher levels of education herself, being Catholic and living in an urban area.Some relationships in the controlled estimates were not estimable due to too little variation in the dependent variable, these are noted by 'No Est.' in the table belowassociated with being older (which effect weakens the older you get), having fewer children, being wealthier, having a female head of household with higher levels of education herself, being Catholic and living in an urban area.

Table 21: Likelihood of starting secondary school for women under 30 by child marriage or teen pregnancy groups – national and regional

		Simple averages (%)		With controls (%)	
Interest (x)		**Marriage**	**Pregnancy**	**Marriage**	**Pregnancy**
National					
Base		30.2	26.4	24.3	22.2
Difference	*x <15*	*-24.5****	*-17.1****	*-14.9****	*-3.2*
from base	*14 <x <18*	*-18.0****	*-12.7****	*-6.4****	*+0.1*
N		9,924		9,914	
Northen Region					
Base		19.1	14.9	15.5	No Est.
Difference	*x <15*	*-13.9****	*-7.3****	*No Est.****	19.7
from base	*14 <x <18*	*-9.8****	*-4.2*	*-3.8**	14.0
N		2,121		2,060	
Central Region					
Base		21.7	19.3	18.7	17.1
Difference	*x <15*	*-17.5****	*-9.6****	*-11.1****	*-2.4*
from base	*14 <x <18*	*-9.0****	*-8.0****	*-2.6*	*+1.3*
N		3,969		3,968	
Southern Region					
Base		48.7	47.5	43.9	42.0
Difference	*x <15*	*-34.0****	*-36.0****	*-21.8***	*-21.4**
from base	*14 <x <18*	*-32.2****	*-24.6****	*-13.5****	*-1.9*
N		3,834		3,832	

Notes: *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. Base is average estimated likelihood with interest variables turned off, changes are average marginal effects of turning on a single interest variable at a time. All estimates survey set.

5.3.3 CHILD MALNUTRITION

In this section, the effects of adolescent pregnancy and child marriage are treated separately because it was necessary to identify the marriage relationship using a subset of the sample (aged under 30). Hence, summarised results for adolescent pregnancy are reported in Table 22and summarised results for child marriage are reported in Table 23. The full probit estimations for analysis of stunting are reported in Table 35 and the full OLS results for analysis of height for age standard deviations are reported in Table 36, both in Annex 0.

INTERPRETING RESULTS

The summarised results tables report the uncontrolled and controlled statistics for each interest variable.

- **Base:** the estimated likelihood of a child exhibiting stunting and the estimated standard deviations in height for age for the base group (children born to mothers under age 18 at birth), and
- **Difference from base:** the estimated difference from base of likelihood of a child exhibiting stunting and the estimated standard deviations in height for age for children born to mothers in the age groups 18-24, 25-34, 35-44 and 45-49.

For example, in the uncontrolled national estimate, 53.4% of children born to women aged under 18 exhibited stunting, a rate that is significantly higher than for children of women in the next three age groups. The greatest difference was with children born to women aged 25-34, who exhibited stunting 13.5% less frequently, at a rate of 39.9%.

Table 23 reports statistics for the

- **Base:** the estimated likelihood of a child exhibiting stunting and the estimated standard deviations in height for age for the base group (children born to mothers who were married under age 18), and
- **Difference from base:** the estimated difference from base of likelihood of a child exhibiting stunting and the estimated standard deviations in height for age for children born to mothers who were not married early.

For example, in the uncontrolled national estimate, 45.9% of children born to women married before they were 18 exhibited stunting, a rate that is higher than that for women who were not married early by 6.1%. These figures are averaged over respondents aged under 30 to ensure contemporary effects are measured.

RESULTS

- The children of adolescent mothers are more malnourished than the children of mothers in later child-bearing ages. The difference in the likelihood of stunting for children born to mothers under 18 and all other age groups is negative and statistically significant for each group but the oldest (45+).
- Relatedly, children born to adolescent mothers are expected to be at least one third of a standard deviation away from WHO mean than others. These effects are robust to controls for other factors, with small decreases in their magnitude.
- The difference is greatest between adolescent mothers and mothers aged over 25. Children of women aged 25-34 (35-44) are estimated to be 11.9% (14.7%) less likely to exhibit stunting after controlling for other factors. Likewise, the children of women aged 25-34 (35-44) are estimated to be 0.37 (0.53) standard deviations closer to the WHO mean than the children of women under 18.
- The relationship between the age-group of the mother and child malnutrition is most pronounced in the Northern region. Only in the Northern region do the relationships discussed above survive introduction of controls with consistent statistical significance. Indeed, in this region child malnutrition appears to become less likely the older the mother is, with reductions in likelihood of stunting increasing with the comparison age group.
- Early motherhood is related to higher rates of stunting and lower height for age standard deviations in the Central and Southern regions as well, but these relationships are not consistently robust to controls.
- The children of mothers who were married under age 18 are no more malnourished than those of mothers who were not. The simple average at the national level shows less stunting (-6.1% likelihood) for children whose mothers were not married early, but this relationship is not robust to controls. Further, height for age is not significantly related to child marriage in either model (with and without controls). Furthermore, none of the regional analyses showed a significant relationship between child marriage and child malnutrition, with or without controls. This suggests that the differences in stunting rates observed between children of women who marry early and those who don't, are in fact due to confounding factors. For instance, it may reflect the fact that women who marry early tend to be poorer, and thus have a higher likelihood of having undernourished children.

Table 22: Likelihood of exhibiting stunting and standard deviations in height for age from WHO mean for children aged 0-59 months by ten-year age group of the mother at birth – national and regions

		Stunting (less than -2 s.d. from WHO mean of height for age) (%)		Height for age s.d. from WHO mean	
	Age group of mother at birth	Estimated likelihood uncontrolled	Estimated likelihood controlled	Estimated value uncontrolled	Estimated value controlled
National					
Base	Less than 18	53.4	54.2	-2.07	-2.09
Difference from base	*18-24*	*-8.7***	*-6.6**	*0.33****	*+0.25***
	25-34	*-13.5****	*-11.9***	*+0.45****	*+0.37****
	35-44	*-12.8****	*-14.7***	*+0.53****	*+0.53****
	45-49	*-0.9*	*-6.7*	*+0.34*	*+0.42*
N		9,313	8,019	9,313	8,019
Northern region					
Base	Less than 18	64.2	71.4	-2.40	-2.59
Difference from base	*18-24*	*-8.1*	*-11.9***	*+0.31*	*+0.40***
	25-34	*-13.0***	*-18.2***	*+0.38**	*+0.48**
	35-44	*-19.3***	*-24.9***	*+0.64***	*0.81***
	45-49	*-4.9*	*-3.9*	*-0.27*	*-0.04*
N		2,421	2,131	2,421	2,151
Central region					
Base	Less than 18	53.4	51.0	-2.08	-2.02
Difference from base	*18-24*	*-9.4**	*-4.3*	*+0.40***	*+0.24*
	25-34	*-13.2***	*-7.6*	*+0.49****	*+0.33**
	35-44	*-11.1**	*-8.9*	*+0.51****	*+0.40*
	45-49	*-5.4*	*-6.0*	*+0.61**	*+0.58*
N		4,048	3,341	4,048	3,341
Southern region					
Base	Less than 18	35.9	34.5	-1.52	-1.39
Difference from base	*18-24*	*-6.5*	*-2.9*	*+0.16*	*-0.04*
	25-34	*-12.4***	*-9.9**	*+0.38***	*+0.17*
	35-44	*-9.4**	*-12.0**	*+0.43****	*+0.31**
	45-49	*+19.3*	*+1.8*	*-0.53*	*-0.45*
N		2,844	2,527	2,844	2,527

Notes: significance here is in the difference from the 'Less than 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

Table 23: Likelihood of exhibiting stunting and standard deviations in height for age from WHO mean for children aged 0-59 months to women aged less than 30 by child marriage status of the mother – national and regions

	Stunting		SD in height/age	
Child marriage status of mother	Estimated likelihood uncontrolled	Estimated likelihood controlled	Estimated value uncontrolled	Estimated value controlled
National				
Married under 18	45.9	45.5	-1.80	-1.81
Difference if did not marry under 18	*-6.1****	*-0.7*	*+0.20*	*+0.05*
N	5,444	4,630	5,444	4,630
Northern Region				
Married under 18	55.9	58.6	-2.09	-2.15
Difference if did not marry under 18	*-1.5*	*+0.4*	*+0.02*	*-0.05*
N	1,363	1,181	1,363	1,193
Central Region				
Married under 18	44.1	45.9	-1.72	-1.79
Difference if did not marry under 18	*-4.1*	*-2.3*	*+0.17*	*+0.12*
N	2,320	1,896	2,320	1,896
Southern Region				
Married under 18	30.5	29.5	-1.41	-1.36
Difference if did not marry under 18	*-3.2*	*+1.7*	*+0.14*	*+0.02*
N	1,761	1,541	1,761	1,541

Notes: significance here is in the difference from the 'Married under 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

5.3.4 CHILD DEATH

In this section, the effects of adolescent pregnancy and child marriage are treated separately because it was necessary to identify the marriage relationship using a subset of the sample (aged under 30). Hence, summarised results for early pregnancy are reported in Table 24 and summarised results for child marriage are reported in Table 25. The full probit estimations are reported in Table 37in AnnexA.3.

INTERPRETING RESULTS

The summarised results tables report the uncontrolled and controlled statistics for each interest variable.

Table 24 reports statistics for the

- **Base:** the estimated likelihood of a child's death for the base group (children born to mothers under age 18 at birth), and
- **Difference from base:** the estimated difference from base of likelihood of a child's death for children born to mothers in the age groups 18-24, 25-34, 35-44 and 45-49.

For example, in the uncontrolled national estimate, 11.8% of children born to women aged under 18 are expected to die, a rate that is significantly higher than for children of women in the next three age groups. The greatest difference was with children born to women aged 35-44, whose children are have a likelihood of dying that is 6.1% lower, at 5.7%.

Table 25 reports statistics for the

- **Base:** the estimated likelihood of a child's death for the base group (children born to mothers who were married under age 18), and
- **Difference from base:** the estimated difference from base of likelihood of a child's death for children born to mothers who were not married early.

For example, in the uncontrolled national estimate,8.0% of children born to women married before they were 18 exhibited stunting, a rate that is higher, but not significantly so, by 0.4% than that for women who were not married early. These figures are averaged over respondents aged under 30 to ensure contemporary effects are measured.

RESULTS

- Child death likelihood appears to be higher for mothers aged under 18 when compared to other age groups, but these relationships (with the exception of mothers aged 35-44) are not robust to controls. At the national level, having a mother who was under 18 means an estimated likelihood of dying that is at least 2.2% higher than for other mothers within child-rearing age, but these estimates tend not to be significantly different from zero. This suggests that differences in death rates observed between children of adolescent mothers and other mothers are due to confounding factors (e.g. adolescent mothers tend to be poorer).
- Introducing controls increases the magnitude of age effects in the Northern region. Child death rates among early mothers are highest in the Northern region (14%) and age appears to be a significant factor here more than in other regions, with children of mothers aged 18-24 (35-44) expected to die with 8.3% (10.5) less likelihood and other age groups showing large (but not statistically significant) reductions as well.
- Estimates of the relationship between the mother's age and child death in the Central and Southern regions are much less precisely estimated. Indeed, in the Southern region, children born to mothers under 18 are estimated to have lower likelihood of death than children of mothers from all age groups, but none of these relationships are statistically significant.
- Child marriage is not related to the likelihood of a child's death. There is no significant relationship between child marriage and likelihood of child death in either the uncontrolled or controlled models. These estimates was generated using the sub-sample of women aged under 30 to isolate contemporary relationships but still produced no effects, hence this lack of estimated relationship is not due to clouded results from generational changes. This result is not surprising – although marriage often leads to pregnancy, once we are looking at the sub-population who are having children we expect that the age of the mother will be the main determinant of any health outcomes, rather than her marital status.
- Few of the controls were significantly associated with child death either. The interval since the last birth and the total number of children were both significant in some provinces but the effects went in opposite directions (higher likelihood of death from longer intervals but also with more children total), which is counterintuitive. Other than this, there were differences between provinces but inconsistent relationships otherwise e.g. in the Southern region (but nowhere else and not at the national level) reduced likelihood of child death was associated with taller mothers and lower maternal anaemia levels.

The child death models provide very poor estimates. They have a very low power in that they predict actual deaths extremely infrequently[29]. The combination of the low power of the models and insignificant relationships with our interest variables suggest that there is some omitted variable that is related to the likelihood of child death much more than those that have been included. Given that they likely suffer from omitted variable bias, results should be interpreted with caution.

Table 24: Likelihood of death for children born up to 59 months before interview by ten-year age group of the mother at birth – national and regional

		Death rate (%)	
	Age group of mother at birth	Estimated likelihood uncontrolled	Estimated likelihood controlled
National			
Base	Less than 18	11.8	10.3
Difference from base	*18-24*	*-3.8**	*-2.2*
	25-34	*-5.0****	*-3.2*
	35-44	*-6.1****	*-4.9**
	45-49	*-4.2*	*-4.0*
N		11,102	11,008
Northern region			
Base	Less than 18	10.1	14.0
Difference from base	*18-24*	*-5.6**	*-8.3**
	25-34	*-4.6*	*-8.5*
	35-44	*-5.0*	*-10.5**
	45-49	*-4.0*	*-10.6*
N		2,797	2,694
Central region			
Base	Less than 18	14.8	11.6
Difference from base	*18-24*	*-4.4*	*-1.4*
	25-34	*-6.7***	*-3.1*
	35-44	*-9.9****	*-6.3**
	45-49	*-7.2*	*-2.8*
N		4,834	4,793
Southern region			
Base	Less than 18	6.8	5.0
Difference from base	*18-24*	*+0.1*	*+2.4*
	25-34	*-1.5*	*+0.8*
	35-44	*+2.8*	*+2.9*
	45-49	*+5.9*	*+2.3*
N		3,471	3,427

Notes: significance here is in the difference from the 'Less than 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

[29] 0% to 1.4% of deaths are correctly predicted across the four models using a 0.5 cutoff in the classification table.

5.3.5 MATERNAL HEALTH

Maternal health is measured by two variables that are known predictors of maternal mortality – the presence of a skilled attendant at the birth of a child and women's fertility, measured by the number of children she has borne in the last three years. These variables are modelled and presented separately.

The likelihood of having a skilled attendant present at the birth of children is low, particularly in the Northern and Central regions, but is not any lower for women who started having children or married early. In fact, underage mothers are more likely to have skilled attendants present than all other age groups, even after controlling for experience with birthing. Hence, concern for women relating to their not receiving proper attention in child birth should be general, and not focused on the younger age group which is actually at less risk.

5.3.5.1 SKILLED ATTENDANT PRESENT AT BIRTH

The effects of adolescent pregnancy and child marriage are treated separately because it was necessary to identify the marriage relationship using a subset of the sample (aged under 30). Hence, summarised results for adolescent pregnancy are reported in Table 26 and summarised results for child marriage are reported in Table 27. The full probit estimations are reported in Table 38 in Annex A.4.

INTERPRETING RESULTS

The summarised results tables report the uncontrolled and controlled statistics for each interest variable.

Table 26 reports statistics for the

- **Base:** the estimated likelihood of a skilled attendant being present at a birth for the base group (where the mother giving birth was under age 18), and
- **Difference from base:** the estimated difference from base of likelihood of a skilled attendant's being present where the mothers were in the age groups 18-24, 25-34, 35-44 and 45-49.

For example, in the uncontrolled national estimate, 64.9% of births to women under age 18 had a skilled attendant present, a higher rate than at births to women in any of the other age groups. Indeed, presence of a skilled attendant is less likely the older the mother, with 45-49 year old mothers being 28.1% less likely than mothers under 18 to have one present.

Table 27 reports statistics for the

- **Base:** the estimated likelihood of a child's death for the base group (children born to mothers who were married under age 18), and
- **Difference from base:** the estimated difference from base of likelihood of a child's death for children born to mothers who were not married early
- For example, in the uncontrolled national estimate, 56.0% of births to women who were married under age 18 had a skilled attendant present, a lower rate than for women who were not married early by 4%. These figures are averaged over respondents aged under 30 to ensure contemporary effects are measured.

Table 25: Likelihood of death for children born up to 59 months before interview to women aged less than 30 by child marriage status of mother – national and regional

	Death rate (%)	
Child marriage status of mother	Estimated likelihood uncontrolled	Estimated likelihood controlled
National		
Married under 18	8.0	7.9
Difference if did not marry under 18	*-0.4*	*+0.0*
N	6,624	6,574
Northern Region		
Married under 18	5.5	5.0
Difference if did not marry under 18	*-0.9*	*+1.1*
N	1,597	1,542
Central Region		
Married under 18	10.3	10.2
Difference if did not marry under 18	*-0.2*	*-0.2*
N	2,837	2,820
Southern Region		
Married under 18	5.8	6.2
Difference if did not marry under 18	*+0.3*	*-0.0*
N	2,190	2,164

Notes: significance here is in the difference from the 'Married under 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

RESULTS

- Underage mothers have skilled attendants present at the birth of their children more frequently than other mothers. Older mothers were less likely to have a skilled attendant present in the uncontrolled and controlled estimates at the national and regional level, though the effects are not robust to controls in the Central region and for older age groups in all regions.
- The likelihood of an underage mother having a skilled attendant present at a birth is highest in the Southern province at 79.8% and lowest in the Central province at 51.7%, potentially reflecting different access to medical services in and around Maputo.
- The child marriage status of a mother is not related to her likelihood of having a skilled attendant present at her birth. The uncontrolled estimates show a small significant effect of being married early but this is not robust to controls either at the national or regional level. Indeed estimates of relationships in the controlled models are all very small so even with precision they would be unimportant.
- Higher likelihoods of having a skilled attendant present at birth are associated with higher wealth in all regions and with moderate levels of schooling (complete primary, starting secondary) and being based in an urban area in the North and Central provinces. In the Southern province, the only significant relationships are with wealth, location in the region and the number of children a woman has have borne.

Table 26: Likelihood of a skilled attendant being present for the birth of children up to 59 months before interview by ten-year age group of the mother at birth – national and regional

		Skilled attendant present at birth (%)	
	Age group of mother at birth	Estimated likelihood uncontrolled	Estimated likelihood controlled
National			
Base	Less than 18	64.9	60.5
Difference from base	*18-24*	*-7.2***	*-7.9***
	25-34	*-11.7****	*-5.4**
	35-44	*-19.6****	*-6.4*
	45-49	*-28.1****	*-9.9*
N		11,102	11,093
Northern region			
Base	Less than 18	62.1	60.4
Difference from base	*18-24*	*-8.2*	*-8.6**
	25-34	*-15.1***	*-11.4**
	35-44	*-15.6***	*-11.4*
	45-49	*-7.6*	*-16.3*
N		2,797	2,797
Central region			
Base	Less than 18	59.1	51.7
Difference from base	*18-24*	*-7.2**	*-6.5*
	25-34	*-10.7***	*-0.7*
	35-44	*-22.2****	*-3.0*
	45-49	*-27.9****	*-5.0*
N		4,834	4,825
Southern region			
Base	Less than 18	83.6	79.8
Difference from base	*18-24*	*-7.4**	*-7.2***
	25-34	*-9.8***	*-4.4*
	35-44	*-12.8****	*-1.5*
	45-49	*-36.7**	*Not est.*
N		3,471	3,469

Notes: significance here is in the difference from the 'Less than 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

Table 27: Likelihood of a skilled attendant being present for the birth of children up to 59 months before interview by child marriage status of the mother for women aged under 30 – national and regional

Child marriage status of mother	Skilled attendant present at birth (%)	
	Estimated likelihood uncontrolled	Estimated likelihood controlled
National		
Married under 18	56.0	58.4
Difference if did not marry under 18	*+5.5***	*+0.1*
N	6,624	6,620
Northern Region		
Married under 18	53.6	54.4
Difference if did not marry under 18	*+0.4*	*-0.2*
N	1,597	1,597
Central Region		
Married under 18	52.6	52.8
Difference if did not marry under 18	*+1.7*	*+0.4*
N	2,837	2,833
Southern Region		
Married under 18	72.7	77.3
Difference if did not marry under 18	*+5.6**	*-0.3*
N	2,190	2,190

Notes: significance here is in the difference from the 'Married under 18' value; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set.

74

Children born per 100 women.

Women aged 15-24 who were married before 15.

5.3.5.2 FERTILITY – BIRTHS IN LAST THREE YEARS

Summarised results for adolescent pregnancy are reported in Table 28 and summarised results for child marriage are reported in Table 29. The full probit estimations are reported in Table 39 in Annex A.4.

INTERPRETING RESULTS

The summarised results tables report the uncontrolled and controlled statistics for each interest variable.

Table 28 reports statistics for the

- **Base:** the average number of children born to women who did not have children early in each ten-year age-group, and
- **Difference from base:** the estimated difference in number of children for women who did have children early for each ten-year age group.

For example, in the uncontrolled national estimate, women aged 15-24 who did not have children early gave birth to an average of 0.34 children each (or 34 children were born per 100 women in this group). By contrast, women in this age group who had children before 15 had an average of 0.43 more children (a total of 77 children per 100 women in this age group).

Table 29 reports statistics for the

- **Base:** the average number of children born to women who were not married early in each ten-year age-group, and
- **Difference from base:** the estimated difference in number of children for women who were married early, for each ten-year age group.

For example, in the uncontrolled national estimate, women aged 15-24 who were not married early gave birth to an average of 0.33 children each (or 33 children were born per 100 women in this age group). By contrast, women in this age group who were married before 15 had an average of 0.41 more children (a total of 74 children per 100 women in this age group).they are older, compared with women who do not marry early.

- We can also see correlation patterns in the full results, which show lower fertility to be associated with higher education, more wealth, having a female head of household with lower education, being Catholic (except in the Northern region, where Catholics are more fertile), living in an urban area and being in Southern provinces.

RESULTS

- Women aged 15-24 who had their first child young had more children in the three years prior to the survey than those in the same age group who did not marry early. This relationship is robust to controls and consistent across provinces. For this particular age group, the result is not surprising – to some extent the dependent variable (children born in the last three years) is measuring nearly the same thing as the independent variable (bore children at young ages) – so the estimates will naturally be higher.
- Women who were older than 25 bore fewer children if they had started having children early than women who waited until after they were 18 or had never had children. This effect is robust to controls and consistent across all regions.

Table 28: Average number of births per woman in the period 1-36 months prior to interview by adolescent pregnancy status and ten year age group – national and regional

Age group	Adolescent pregnancy age group x uncontrolled			Adolescent pregnancy age group x uncontrolled		
	Base	x <15	x =15-18	Base	x <15	x =15-18
National						
15-24	0.34	*+0.43****	*+0.47****	0.32	*+0.33****	*+0.44****
25-34	0.71	*-0.04*	*+0.00*	0.68	*-0.18****	*-0.03***
35-44	0.48	*-0.15***	*-0.12****	0.38	*-0.23****	*-0.11****
45-49	0.15	*-0.14****	*-0.09***	0.11	*-0.11****	*-0.06****
N		13,745			13,731	
Northen region						
15-24	0.40	*+0.38****	*0.37****	0.36	*+0.41****	*+0.40****
25-34	0.76	*-0.11*	*-0.02*	0.70	*-0.32****	*-0.03*
35-44	0.55	*-0.24***	*-0.10*	0.47	*-0.23****	*-0.13****
45-49	0.19	*-0.14**	*-0.13***	0.19	*-0.19****	*-0.16****
N		2,954			2,954	
Central region						
15-24	0.35	*+0.45****	*+0.52****	0.34	*+0.35****	*+0.38****
25-34	0.80	*-0.09*	*-0.02*	0.80	*-0.13***	*-0.05**
35-44	0.53	*-0.14*	*-0.14***	0.39	*-0.21****	*-0.08****
45-49	0.21	*-0.19****	*-0.12**	0.14	*-0.14****	*-0.07****
N		5,245			5,234	
Central region						
15-24	0.29	*+0.35****	*+0.51****	0.27	*+0.13****	*+0.49****
25-34	0.52	*+0.07*	*-0.00*	0.49	*-0.03**	*-0.03**
35-44	0.33	*-0.13**	*-0.12****	0.27	*-0.17****	*-0.11****
45-49	0.03	*-0.03**	*+0.01*	0.02	*-0.02***	*+0.01**
N		5,546			5,543	

Notes: significance here is in the difference from the 'base' value on the same line (same age group); *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set and come from margins on a Tobit model with lower censoring at zero

- Women who marry early have higher fertility rates when they are young. At the national level, women in the 15-24 age group who married between 15 and 18 had an average of 0.21 more children (or 21 more per 100 women in this group) than those who did not marry young over the same period; this means that women aged 15-24 who married between 15 and 18 had approximately the same fertility rate as women aged 25-34 who didn't marry early, the most fertile group. Women in this age group who married under 15 were not significantly more or less fertile than those who did not marry early.
- Women in the 25-34 age group who marry early do not have significantly different fertility to those who don't. This suggests that once in this prime child-bearing age group, the age when a woman was married is not influential on her fertility, though it is when she is younger. This finding does not hold at the regional level.
- Although within each region, women aged 25-34 were approximately equally fertile if they were not married early or if they were married before 15, the effect of being married between 15 and 18 differs by region. In the Northern region, there was no significant difference, whereas in the Central region this group is estimated to have had four more children per 100 women and in the Southern region they are estimated to have had five more children.
- The overall patterns of fertility crossed with age groups and child marriage and child status suggest that child marriage leads to women shifting forward child-rearing, leading to higher rates when they are younger and lower rates when they are older, compared with women who do not marry early.
- We can also see correlation patterns in the full results, which show lower fertility to be associated with higher education, more wealth, having a female head of household with lower education, being Catholic (except in the Northern region, where Catholics are more fertile), living in an urban area and being in Southern provinces.

Table 29: Average number of births per woman in the period 1-36 months prior to interview by child marriage status and ten year age group – national and regional

Age group		Child marriage age group x uncontrolled			Child marriage age group x uncontrolled	
	Base	x <15	x =15-18	Base	x <15	x =15-18
National						
15-24	0.33	*+0.41****	*+0.42****	0.41	*+0.01*	*+0.21****
25-34	0.68	*+0.05*	*+0.04*	0.66	*-0.01*	*+0.00*
35-44	0.47	*-0.07**	*-0.08**	0.36	*-0.05***	*-0.05****
45-49	0.15	*-0.08**	*-0.07**	0.09	*+0.06*	*-0.04****
N		13,745			13,731	
Northen region						
15-24	0.39	*+0.29****	*+0.29****	0.47	*-0.05**	*+0.13****
25-34	0.74	*+0.01*	*+0.01*	0.66	*-0.04*	*+0.01*
35-44	0.51	*-0.08*	*+0.03*	0.38	*+0.01*	*+0.10****
45-49	0.19	*+0.01*	*-0.14***	0.10	*+0.32****	*-0.07****
N		2,954			2,954	
Central region						
15-24	0.30	*+0.48****	*+0.49****	0.36	*+0.12****	*+0.31****
25-34	0.80	*-0.02*	*-0.00*	0.78	*+0.06**	*-0.04****
35-44	0.56	*-0.14**	*-0.21****	0.43	*-0.14****	*-0.19****
45-49	0.20	*-0.16**	*-0.08*	0.13	*-0.03*	*-0.04****
N		5,245			5,234	
Central region						
15-24	0.32	*+0.41****	*+0.41****	0.35	*-0.04**	*+0.22****
25-34	0.50	*+0.08*	*+0.07*	0.47	*-0.01*	*+0.05****
35-44	0.30	*-0.04*	*-0.01*	0.23	*-0.03*	*-0.00*
45-49	0.04	*+0.02*	*-0.01*	0.02	*+0.05****	*-0.01**
N		5,546			5,543	

Notes: significance here is in the difference from the 'base' value on the same line; *** denotes a p-value <0.001, ** p<0.01, and * p<0.05. All estimates survey set and come from margins on a Tobit model with lower censoring at zero

We can see correlation patterns in the full results, which show lower fertility to be associated with higher education, more wealth and having a female head of household.

06 Concluding remarks

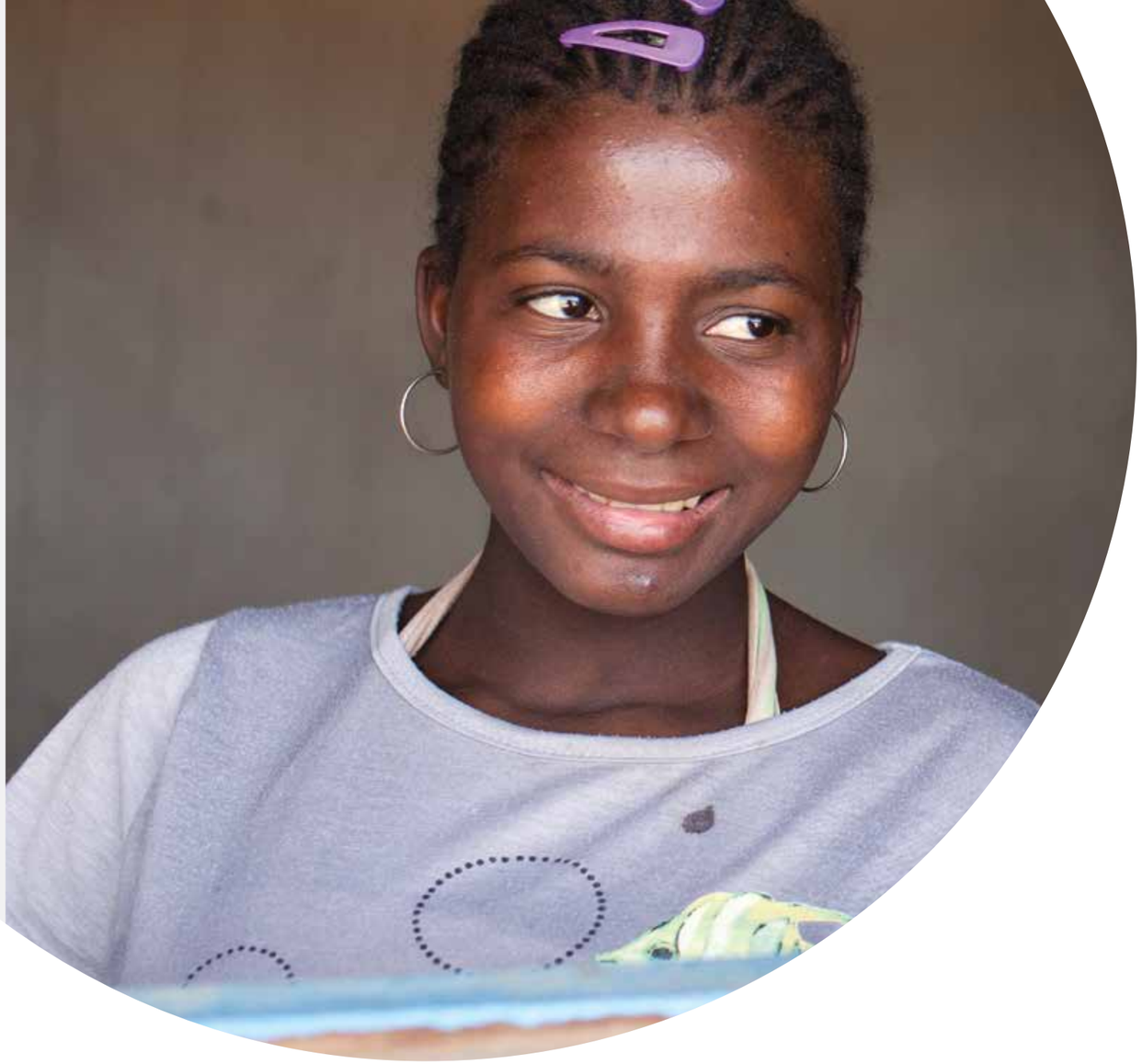
The study presented in this papers shows that child marriage and adolescent pregnancy remain major child protection issues in Mozambique, with over 12% of girls between the ages of 15 and 24 having been married before the age of 15 and close to one third of all girls getting married before the age of 18. In Niassa more than one fifth of all interviewed women were married before the age of 15.

Child marriage and adolescent pregnancies are closely related, since the study shows that the overwhelming majority of adolescent pregnancies happen among girls who have married early. On average, girls have their first child 15 months after they get married and rarely more than 24 months after their marriage.

While there have been some improvements in the rates of child marriage in recent years, the changes remain statistically insignificant in most provinces, with a partial exception of the northern provinces, which have seen a statistically significant decrease from a very high starting point. Furthermore, in most almost all provinces, the modest improvements in child marriage rates have been insufficient to make up for the fast population growth, meaning that even if the percentage of girls married in their teens has decreased, the absolute number of child marriages has increased. Finally, in many provinces, the improvement in the rate of child marriages has not translated into an improvement in adolescent pregnancy rates, due to the increase of births out of wedlock. In fact, four provinces have seen the rate of adolescent pregnancies increase over the past 15 years.

The regression results have highlighted the importance of economic factors, in addition to geographic and religious factors, as girls from the richest quintile and girls from households that own land are significantly less likely to get married in their teens. The probability of getting married as a child also decreases with the age of the head of household and for girls living in household headed by women. When it comes to preventing adolescent pregnancies, one crucial factor appears to be women's empowerment, and in particular their ability to request the use of contraception. Another important factor is access to information as girls who have access to a radio are significantly less likely to get pregnant in their teens. However, after controlling for all differences between urban and rural areas (e.g. the fact that urban girls tend to be richer and better educated than rural girls and get married later), we find that urban girls actually are at higher risk of adolescent pregnancy, notably due to the more frequent occurrence of sexual relations outside of marriage.

The study finds that child marriage and adolescent pregnancies have a negative impact on a range of wellbeing indicators for women. In particular, we find a strong and significant effect of child marriage on girls' schooling. Similarly we find that adolescent pregnancy is associated with higher risk of malnutrition and death among children of adolescent mothers. This finding is particularly robust for northern regions. Due to data limitations, it was not possible to successfully estimate the impact of child marriage/ pregnancy on maternal mortality.



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The study finds that child marriage and adolescent pregnancies have a negative impact on a range of wellbeing indicators for women.

07 Annex A Regression results

A.1 DETERMINANTS OF CHILD MARRIAGE AND TEEN PREGNANCY (WITH WEALTH)

Because of the way that the wealth index is constructed in the DHS – using factor analysis on a range of proxy indicators – it is not possible to include the wealth index in our regression alongside its composing indicators, such as land ownership, etc. For this reason we have constructed a sparate regression in Table 31 below that includes wealth as an explanatory variable but excludes most of the its composing indicators. Table 30belowshows percentage of listening to radio is more or less the similar among women in all wealth quintiles and across rural and urban area. This clearly indicates wealth quintile cannot discern the radio listening pattern across rural and urban areas. Hence, we include the frequency of listening to radio in our regression along with wealth quintiles. However, women belonging to richer wealth quintiles have greater access to television. Thus, wealth can discern the pattern of television watching across rural and urban areas. Hence we exclude the frequency of watching television from regression analysis when we include wealth quintiles in our analysis.

A.1 DETERMINANTS OF CHILD MARRIAGE AND TEEN PREGNANCY (WITH WEALTH)

Table 30: Percentage of people listening to radio and TV by place of residence and within wealth quintiles for women in age group 15-24

	RURAL		URBANO	
Access to media	Three Bottom Quintiles	Two Richer Quintiles	Three Bottom Quintiles	Two Richer Quintiles
Listening to radio	62.2	63.9	66.6	73.8
Watching TV	11.9	42.5	31.8	85.0

Source: Author's calculations from DHS 2011

Table 31: Probit regression results for age at first cohabitation below 15/18 years within specified age groups

INDEPENDENT VARIABLES	MARRIAGE<15 (AGE 15-24)	MARRIAGE<18 (AGE 18-24)
In of Age of household head	-0.44 ***	-0.70 ***
Male household head	0.09	0.28 ***
Women primary education	-0.08	0.16 *
Women secondary education	-0.81 ***	-0.52 ***
Head's primary education	-0.08	-0.08
Head's secondary education	-0.04	-0.19 *
Rural	-0.03	0.05
Frequency of listening to radio	-0.02	-0.04
No. of siblings	-0.01	0.00
Poorest	0.07	0.04
Poorer	0.05	0.02
Middle	0.10	0.30 ***
Richer	0.24 **	0.39 ***
Christian	-0.06	-0.21 **
Islamic	-0.20	-0.48 ***
Other	-0.25	-0.27
North	0.47 ***	0.66 ***
Centre	0.28 ***	0.32 ***
Constant	0.31	2.12 ***

Notes: *** denotes a p-value < 0.01 ; **d enotes p-value<.05; * denotes p-value<0.1. Sample size: 5319 standard error adjusted for 610 clusters. Pseudo R2 =0.0848. Sample size: 3433 standard error adjusted for 606 clusters. Pseudo R2 =0.1500. Richest wealth quintile and southern regions are considered as base.

Table 32: Probit regression results for teen pregnancy below 15/18 years within specified age groups

INDEPENDENT VARIABLES	MARRIAGE<15 (AGE 15-24)	MARRIAGE<18 (AGE 18-24)
Ln Age gap	0.03	-0.07
In of Age of household head	0.11	-0.16 **
Male household head	-0.05	-0.06
Women primary education	-0.07	0.11
Women secondary education	-0.40 ***	-0.31 ***
Husband/Partner primary education	0.13	0.12
Husband/Partner secondary education	0.03	0.20
Head's primary education	-0.04	-0.09
Head's secondary education	-0.08	-0.21 *
Rural	-0.18 *	0.05
Frequency of listening to radio	-0.17 **	-0.04
No. of siblings	0.01	0.00
N. of co-wives	0.08	0.00
Poorest	-0.09	0.06
Poorer	-0.09	-0.11
Middle	0.06	0.11
Richer	0.09	0.15 *
Respondent takes household decision	-0.13	0.05
Respondent can't ask for contraceptive use to husband	0.14	0.03
Respondent use modern methods of contraceptive	0.19	0.07
Respondent use traditional methods of contraceptive	-	-0.61
Respondent don't use but intend to use contraceptive later	-0.07	0.04
Christian	0.02	-0.09
Islamic	0.25	-0.12
Other	-0.08	-0.26
North	0.06	0.11
Centre	0.20 *	-0.07
Dummy for never married	-0.94 ***	-0.69 ***
Constant	-1.58 ***	0.71 **

Notes: *** denotes a p-value < 0.01 ; **denotes p-value<.05; * denotes p-value<0.1. Sample size: 5210, standard error adjusted for 610 clusters, pseudo R2 =0.1058. Sample size: 3466 standard error adjusted for 604 clusters. Pseudo R2 =0.0734. Richest wealth quintile and southern regions are considered as base.

A.2 SCHOOLING OUTCOMES CONTROLLED MODEL RESULTS

Table 33: Probit regression results for finish primary school models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Gender (base=female)		0.29 (0.05)***	0.53 (0.12)***	0.33 (0.08)***	0.04 (0.07)
Child marriage group & Early children group (base=no child marriage & no early kids)					
	No child marriage & Kids under 15	-0.58 (0.18)**	-0.27 (0.37)	-0.68 (0.28)*	-0.62 (0.26)*
	No child marriage & Kids 15-18	-0.05 (0.09)	-0.19 (0.22)	0.19 (0.2)	-0.13 (0.1)
	Married under 15 & No early kids	-0.63 (0.18)***	-0.97 (0.25)***	-0.41 (0.3)	-0.55 (0.27)*
	Married under 15 & Kids under 15	-0.26 (0.14)	-0.53 (0.23)*	-0.06 (0.2)	-0.45 (0.3)
	Married under 15 & Kids 15-18	-0.55 (0.11)***	-0.64 (0.19)**	-0.47 (0.18)*	-0.68 (0.2)**
	Married 15-18 & No early kids	-0.35 (0.07)***	-0.48 (0.2)*	-0.24 (0.1)*	-0.33 (0.09)**
	Married 15-18 & Kids under 15	0.27 (0.21)	0.4 (0.44)	0.37 (0.32)	-0.08 (0.3)
	Married 15-18 & Kids 15-18	-0.18 (0.07)*	-0.02 (0.15)	-0.15 (0.11)	-0.28 (0.1)**
Gender & Child marriage group & Early children group (base=female & no child marriage & no early kids)					
	Male & No child marriage & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & No child marriage & Kids 15-18	0.53 (0.31)	-0.13 (0.44)	1.07 (0.48)*	-0.12 (0.39)
	Male & Married under 15 & No early kids	No obs.	No obs.	No obs.	No obs.
	Male & Married under 15 & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & Married under 15 & Kids 15-18	No obs.	No obs.	No obs.	No obs.
	Male & Married 15-18 & No early kids	0.06 (0.2)	-0.04 (0.39)	0.03 (0.28)	0.09 (0.33)
	Male & Married 15-18 & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & Married 15-18 & Kids 15-18	0.02 (0.26)	-1.2 (0.42)**	0.26 (0.35)	0.49 (0.6)
Age		0.54 (0.05)***	0.23 (0.12)	0.69 (0.09)***	0.49 (0.07)***
Square of age		-0.01 (0)***	-0.01 (0)	-0.02 (0)***	-0.01 (0)***
Total children born		-0.18 (0.02)***	-0.08 (0.04)	-0.23 (0.04)***	-0.24 (0.03)***
Log wealth		0.57 (0.04)***	0.62 (0.07)***	0.54 (0.05)***	0.53 (0.08)***
Female head of household (base=no)		0.22 (0.04)***	0.28 (0.1)**	0.34 (0.07)***	0 (0.05)
Head of household highest education (base=no education)					
	Incomplete primary	0.01 (0.06)	-0.06 (0.13)	0 (0.09)	0.06 (0.08)
	Complete Primary	0.77 (0.08)***	0.96 (0.14)***	0.74 (0.12)***	0.64 (0.12)***
	Incomplete seconday	1.04 (0.07)***	1.4 (0.13)***	1 (0.11)***	0.83 (0.1)***
	Complete secondary	1.2 (0.13)***	1.43 (0.25)***	1.2 (0.2)***	0.97 (0.19)***
	Higher	0.88 (0.15)***	1.41 (0.36)***	0.92 (0.26)**	0.65 (0.19)**
	Don't know	0.28 (0.1)**	-0.15 (0.37)	0.45 (0.18)*	0.21 (0.14)
Religion (base=Catholic)					
	Islamic	-0.35 (0.08)***	-0.36 (0.09)***	-0.31 (0.19)	0.36 (0.23)
	Zion	-0.36 (0.07)***	-1.07 (0.56)	-0.34 (0.11)**	-0.34 (0.08)***
	Evangelical/ Pentecostal	-0.32 (0.07)***	0.66 (0.42)	-0.39 (0.09)***	-0.22 (0.08)**
	No religion	-0.58 (0.07)***	-1.31 (0.34)***	-0.6 (0.1)***	-0.5 (0.12)***
	Other	-0.04 (0.1)	-0.08 (0.3)	-0.15 (0.15)	0.09 (0.1)
Location (base=urban)		-0.3 (0.06)***	-0.16 (0.13)	-0.37 (0.08)***	-0.27 (0.09)**
Province (base=Niassa)					
	Cabo Delgado	-0.18 (0.11)	-0.12 (0.11)		
	Nampula	-0.24 (0.11)*	-0.19 (0.11)		
	Zambezia	-0.3 (0.11)**		(base)	
	Tete	-0.19 (0.11)		0.15 (0.1)	
	Manica	0.2 (0.11)		0.54 (0.1)***	
	Sofala	-0.21 (0.11)*		0.11 (0.1)	
	Inhambane	0.1 (0.12)			(base)
	Gaza	0.04 (0.12)			-0.05 (0.1)
	Maputo Province	0.02 (0.12)			-0.02 (0.11)
	Maputo City	-0.04 (0.12)			-0.08 (0.11)
Intercept		-12.17 (0.68)***	-9.76 (1.64)***	-13.88 (1)***	-10.84 (1.21)***
N		9,971	2,124	3,968	3,879
% predictions classified correctly		81%	86%	83%	78%

Table 34: Probit regression results for start secondary school models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Gender (base=female)		0.18 (0.06)**	0.47 (0.17)**	0.28 (0.09)**	-0.12 (0.06)
Child marriage group & Early children group (base=no child marriage & no early kids)					
	No child marriage & Kids under 15	-0.45 (0.21)*	0.05 (0.38)	-0.8 (0.32)*	-0.62 (0.27)*
	No child marriage & Kids 15-18	-0.1 (0.09)	-0.11 (0.29)	0.06 (0.21)	-0.18 (0.09)
	Married under 15 & No early kids	-0.89 (0.19)***	-1.37 (0.42)**	-0.98 (0.34)**	-0.56 (0.3)
	Married under 15 & Kids under 15	-0.16 (0.16)	-0.53 (0.33)	0.1 (0.23)	-0.21 (0.33)
	Married under 15 & Kids 15-18	-0.81 (0.14)***	-0.64 (0.22)**	-1.06 (0.26)***	-0.65 (0.21)**
	Married 15-18 & No early kids	-0.47 (0.08)***	-0.61 (0.21)**	-0.27 (0.14)*	-0.55 (0.1)***
	Married 15-18 & Kids under 15	0.27 (0.3)	0.76 (0.46)	0.63 (0.36)	-0.99 (0.66)
	Married 15-18 & Kids 15-18	-0.24 (0.08)**	-0.05 (0.17)	-0.09 (0.11)	-0.51 (0.1)***
Gender & Child marriage group & Early children group (base=female & no child marriage & no early kids)					
	Male & No child marriage & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & No child marriage & Kids 15-18	0.35 (0.3)	0.42 (0.45)	0.61 (0.5)	-0.15 (0.37)
	Male & Married under 15 & No early kids	No obs.	No obs.	No obs.	No obs.
	Male & Married under 15 & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & Married under 15 & Kids 15-18	No obs.	No obs.	No obs.	No obs.
	Male & Married 15-18 & No early kids	0.29 (0.2)	0.23 (0.46)	0.13 (0.29)	0.32 (0.33)
	Male & Married 15-18 & Kids under 15	No obs.	No obs.	No obs.	No obs.
	Male & Married 15-18 & Kids 15-18	0.04 (0.31)	-0.58 (0.43)	0.28 (0.46)	0.15 (0.53)
Age		0.69 (0.05)***	0.46 (0.18)*	0.83 (0.08)***	0.65 (0.07)***
Square of age		-0.01 (0)***	-0.01 (0)*	-0.02 (0)***	-0.01 (0)***
Total children born		-0.24 (0.03)***	-0.15 (0.05)**	-0.3 (0.04)***	-0.26 (0.03)***
Log wealth		0.63 (0.04)***	0.81 (0.08)***	0.58 (0.06)***	0.52 (0.1)***
Female head of household (base=no)		0.18 (0.05)***	0.42 (0.14)**	0.23 (0.08)**	-0.02 (0.06)
Head of household highest education (base=no education)					
	Incomplete primary	0.02 (0.06)	-0.04 (0.11)	-0.02 (0.12)	0.09 (0.08)
	Complete Primary	0 (0.08)	-0.06 (0.16)	-0.14 (0.17)	0.15 (0.11)
	Incomplete seconday	0.98 (0.08)***	1.33 (0.16)***	0.91 (0.13)***	0.86 (0.1)***
	Complete secondary	1.05 (0.12)***	0.88 (0.27)**	1.13 (0.21)***	1.08 (0.15)***
	Higher	1.03 (0.14)***	1.17 (0.25)***	0.95 (0.24)***	1.05 (0.18)***
	Don't know	0.27 (0.12)*	-0.36 (0.54)	0.24 (0.31)	0.32 (0.13)*
Religion (base=Catholic)					
	Islamic	-0.35 (0.08)***	-0.39 (0.09)***	-0.22 (0.2)	0.03 (0.18)
	Zion	-0.35 (0.07)***	-0.6 (0.6)	-0.4 (0.12)**	-0.31 (0.07)***
	Evangelical/ Pentecostal	-0.29 (0.07)***	0.61 (0.37)	-0.38 (0.09)***	-0.21 (0.08)**
	No religion	-0.6 (0.08)***	-0.92 (0.36)*	-0.7 (0.11)***	-0.46 (0.11)***
	Other	0.01 (0.08)	0.17 (0.31)	-0.22 (0.14)	0.18 (0.1)
Location (base=urban)		-0.21 (0.07)**	-0.02 (0.18)	-0.31 (0.09)**	-0.2 (0.11)
Province (base=Niassa)					
	Cabo Delgado	-0.17 (0.11)	-0.18 (0.12)		
	Nampula	-0.24 (0.14)	-0.23 (0.13)		
	Zambezia	-0.31 (0.13)*			
	Tete	-0.14 (0.12)		0.24 (0.14)	
	Manica	0.07 (0.12)		0.46 (0.14)**	
	Sofala	-0.29 (0.12)*		0.05 (0.14)	
	Inhambane	-0.12 (0.17)			
	Gaza	-0.08 (0.13)			0.06 (0.14)
	Maputo Province	-0.17 (0.12)			0 (0.14)
	Maputo City	-0.22 (0.12)			-0.03 (0.15)
Intercept		-15.15 (0.84)***	-15.02 (2.31)***	-16.65 (1.21)***	-13.32 (1.51)***
N		9,971	2,124	3,968	3,879
% predictions classified correctly		83%	89%	87%	76%

A.3 CHILD HEALTH OUTCOMES CONTROLLED MODEL RESULTS

Table 35: Probit regression results for stunting models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Mother's age at birth (base=under 18)					
	18-24	-0.18 (0.08)*	-0.35 (0.14)*	-0.12 (0.12)	-0.09 (0.14)
	25-34	-0.33 (0.1)**	-0.52 (0.18)**	-0.21 (0.13)	-0.33 (0.16)*
	35-44	-0.41 (0.12)**	-0.7 (0.23)**	-0.24 (0.17)	-0.4 (0.2)*
	45-49	-0.18 (0.2)	-0.12 (0.36)	-0.16 (0.25)	0.06 (0.48)
Mother was married before 18 (base=No)		-0.02 (0.04)	0.01 (0.07)	-0.06 (0.06)	0.06 (0.07)
Mother's highest schooling (base=No education)					
	Incomplete primary	0.04 (0.05)	0.08 (0.09)	0.02 (0.07)	0.08 (0.12)
	Complete Primary	-0.1 (0.09)	-0.26 (0.2)	-0.19 (0.15)	0.16 (0.17)
	Incomplete secondary	-0.02 (0.1)	-0.22 (0.21)	0.02 (0.15)	-0.01 (0.16)
	Complete secondary	-0.28 (0.17)	-0.31 (0.27)	-0.37 (0.37)	-0.47 (0.36)
	Higher	0.11 (0.4)	No obs.	0.02 (0.72)	0.45 (0.38)
	Don't know	-0.25 (0.26)	No obs.	0.56 (0.61)	-0.55 (0.33)
Mother's literacy (base=Able to read only parts of sentence)					
	Able to read whole sentence	0.05 (0.08)	0.18 (0.16)	0.07 (0.15)	-0.16 (0.11)
	No card with required language	-0.02 (0.06)	-0.03 (0.13)	0.06 (0.1)	-0.18 (0.1)
	Blind/visually impaired	0.09 (0.45)	No obs.	0.02 (0.54)	0.26 (0.67)
Mother's anaemia level (base=None)					
	Mild	0.03 (0.04)	0.16 (0.08)	-0.02 (0.05)	-0.05 (0.07)
	Moderate	0.16 (0.06)*	0.32 (0.13)*	0.08 (0.1)	0.14 (0.1)
	Severe	0.48 (0.17)**	-0.03 (0.35)	0.85 (0.21)***	0.01 (0.4)
	Not measured	0.33 (0.28)	0.95 (0.66)	-0.46 (0.69)	0.31 (0.32)
Log of mother's height		-4.97 (0.58)***	-3.5 (1.17)**	-5.95 (0.84)***	-6.33 (0.85)***
Log of interval between this and the mother's last child		-0.02 (0.02)	0.03 (0.03)	-0.05 (0.02)*	-0.03 (0.02)
Log number of antenatal visits for most recent birth		0.03 (0.03)	0.04 (0.07)	0.02 (0.04)	0.07 (0.04)
At least one antenatal visit was at medical facility (base=No medical visits)					
	At least one	-0.09 (0.09)	0.12 (0.23)	-0.15 (0.11)	0.15 (0.23)
	NA/don't know	-0.02 (0.17)	0.15 (0.33)	0.25 (0.43)	0.24 (0.29)
	Not last born	-0.4 (0.11)***	-0.21 (0.28)	-0.45 (0.13)**	-0.1 (0.24)
Mother participates in health decisions		0.04 (0.05)	0.02 (0.1)	0.03 (0.08)	0.2 (0.13)
Log number of decisions made		-0.02 (0.03)	0.04 (0.06)	0.01 (0.05)	-0.14 (0.06)*
Child's gender (base=male)		-0.11 (0.04)**	-0.18 (0.08)*	-0.08 (0.05)	-0.13 (0.06)*
Child's age in months		0.31 (0.06)***	0.39 (0.11)***	0.33 (0.09)***	0.17 (0.1)
Child's size at birth (base=Very small)					
	Smaller than average	0.17 (0.25)	1.25 (0.58)*	0.07 (0.36)	-0.35 (0.2)
	Average	-0.04 (0.25)	0.93 (0.56)	-0.12 (0.36)	-0.47 (0.19)*
	Larger than average	-0.15 (0.25)	0.88 (0.56)	-0.22 (0.36)	-0.67 (0.18)***
	Very large	-0.11 (0.25)	0.88 (0.55)	-0.13 (0.4)	-0.72 (0.25)**
Child's anaemia level (base=None)					
	Mild	0.06 (0.07)	0.07 (0.16)	0.11 (0.1)	0 (0.11)
	Moderate	0.3 (0.07)***	0.23 (0.14)	0.3 (0.1)**	0.44 (0.1)***
	Severe	0.05 (0.14)	0 (0.24)	-0.02 (0.19)	0.98 (0.39)*
	Not measured	0.14 (0.06)*	0.2 (0.12)	0.16 (0.08)	0.09 (0.08)
Child had fever		0.07 (0.05)	0.01 (0.11)	0.11 (0.07)	0.09 (0.1)
Child had diarrhoea		0.09 (0.06)	0.21 (0.14)	0.04 (0.08)	-0.08 (0.11)
Child had cough		0.01 (0.08)	-0.07 (0.19)	0.16 (0.13)	0.03 (0.11)
Log number of times fed solid food in last 24 hours		-0.03 (0.01)*	-0.01 (0.02)	-0.01 (0.01)	-0.06 (0.02)**
Child has received Vit. A supplements		0.02 (0.04)	-0.01 (0.07)	-0.02 (0.07)	0.15 (0.09)
Log number of vaccines child has received		-0.1 (0.05)	-0.26 (0.11)*	-0.03 (0.07)	-0.12 (0.14)
Child has received 3 doses of DPT vaccine		0.1 (0.07)	0.32 (0.13)*	-0.01 (0.09)	0.02 (0.15)
Child's breastfeeding status (base=breastfed exclusively)					
	Only plain water	-0.13 (0.38)	No obs.	0.34 (0.52)	0.99 (0.74)
	Not exclusively breastfed	0.18 (0.28)	0.02 (0.47)	0.4 (0.42)	1.28 (0.46)**
	Not currently breastfed	0.23 (0.25)	-0.17 (0.35)	0.46 (0.36)	1.63 (0.45)***
	Never breastfed	0.25 (0.28)	0.54 (0.48)	0.15 (0.42)	1.61 (0.48)**
Complementary foods given to breastfeeding child (base=no breast or no food)					
	Breast and food	0.02 (0.11)	-0.13 (0.27)	0.03 (0.17)	0.17 (0.14)
	Not applicable	No obs.	No obs.	No obs.	No obs.
Total children born		0.02 (0.01)	0 (0.02)	0.03 (0.02)	0.06 (0.03)*
Log wealth		-0.11 (0.03)**	-0.2 (0.07)**	-0.07 (0.04)	-0.06 (0.06)
Household head gender (base=male)		0.01 (0.04)	0.16 (0.1)	0.03 (0.06)	-0.15 (0.07)*
Household head highest education (base=No education)					
	Incomplete primary	-0.13 (0.05)*	-0.1 (0.08)	-0.2 (0.07)**	0.03 (0.1)
	Complete Primary	-0.09 (0.08)	0.05 (0.12)	-0.15 (0.13)	-0.02 (0.14)
	Incomplete secondary	-0.15 (0.08)*	0.17 (0.15)	-0.34 (0.11)**	0.05 (0.15)
	Complete secondary	-0.2 (0.14)	0.77 (0.21)***	-0.6 (0.21)**	-0.51 (0.26)*
	Higher	-1.44 (0.36)***	No obs.	-1.54 (0.67)*	-0.99 (0.38)**
	Don't know	-0.02 (0.16)	-0.09 (0.55)	-0.21 (0.21)	0.2 (0.17)
Religion (base=Catholic)					
	Islamic	0.08 (0.06)	0.02 (0.07)	0.37 (0.17)*	0.08 (0.27)
	Zion	0.04 (0.06)	0.22 (0.42)	0.04 (0.08)	0.18 (0.1)
	Evangelical/ Pentecostal	-0.02 (0.06)	-0.35 (0.26)	0.02 (0.07)	0.1 (0.11)
	No religion	-0.09 (0.07)	-0.34 (0.23)	-0.07 (0.08)	0.1 (0.15)
	Other	-0.09 (0.07)	-0.1 (0.3)	0.01 (0.08)	-0.06 (0.13)
Location (base=urban)		0 (0.06)	0.04 (0.13)	-0.08 (0.08)	0.18 (0.08)*
Province (base=Niassa)					
	Cabo Delgado	0 (0.1)	-0.02 (0.11)		
	Nampula	0.17 (0.1)	0.14 (0.12)		
	Zambezia	-0.07 (0.1)			
	Tete	-0.02 (0.11)		0.11 (0.09)	
	Manica	-0.03 (0.11)		0.08 (0.09)	
	Sofala	-0.2 (0.1)*		-0.1 (0.08)	
	Inhambane	-0.18 (0.11)			
	Gaza	-0.37 (0.11)**			-0.13 (0.1)
	Maputo Province	-0.45 (0.13)***			-0.19 (0.12)
	Maputo City	-0.29 (0.12)*			-0.01 (0.13)
Intercept		25.53 (2.97)***	18.03 (6.16)**	29.81 (4.14)***	30.77 (4.42)***
N					
% correctly classified					

Table 36: OLS regression results for height for age standard deviations from WHO mean models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Mother's age at birth (base=under 18)					
	18-24	24.68 (8.52)**	39.63 (15)**	23.68 (12.54)	-4.19 (9.47)
	25-34	36.85 (10.11)***	47.96 (19.41)*	32.93 (15.28)*	16.88 (11.87)
	35-44	52.74 (13.42)***	81.05 (23.86)**	40.11 (21.04)	31.07 (15.53)*
	45-49	42.41 (29.17)	-3.85 (41.92)	58.3 (38.53)	-45.24 (58.59)
Mother was married before 18 (base=No)		4.53 (4.67)	-5.07 (8.29)	12.29 (7.47)	1.98 (7)
Mother's highest schooling (base=No education)					
	Incomplete primary	3.98 (6.04)	-3.55 (9.9)	9.58 (8.55)	0.9 (11.89)
	Complete Primary	25.72 (11.46)*	28.45 (24.89)	45.57 (18.05)*	-4.77 (18.54)
	Incomplete secondary	19.12 (10.72)	38.67 (27.01)	24.21 (16.7)	4.98 (15.76)
	Complete secondary	48.66 (15.72)**	35.58 (25.15)	86.62 (32.42)**	20.08 (21.7)
	Higher	33.59 (24.83)	66.88 (44.66)	49.03 (45.93)	15.14 (32.88)
	Don't know	8.41 (21.48)	-220.06 (30.75)***	2.41 (75.74)	9.92 (24.81)
Mother's literacy (base=Able to read only parts of sentence)					
	Able to read whole sentence	-10.74 (8.03)	-13.5 (15.53)	-16.38 (13.68)	1.95 (9.47)
	No card with required language	-5.49 (7.05)	0.36 (17.44)	-12.66 (10.54)	4.08 (9.21)
	Blind/visually impaired	63.72 (54.77)		38.89 (59.88)	140.22 (116.93)
Mother's anaemia level (base=None)					
	Mild	-1.86 (5.18)	-21.38 (10.37)*	5.75 (7.64)	4.81 (6.22)
	Moderate	-14.16 (7.52)	-27.46 (12.4)*	-8.48 (12.17)	-8.49 (8.68)
	Severe	-51 (16.52)**	-4.16 (26.46)	-82.79 (22.09)***	0.68 (31.73)
	Not measured	-56.97 (40.81)	-162.25 (108.73)	-81.8 (24.48)**	-4.96 (25.21)
Log of mother's height		593.36 (61.95)***	424.43 (127.74)**	659.23 (89.57)***	739.23 (76.18)***
Log of interval between this and the mother's last child		3.65 (1.77)*	1.93 (3.25)	4.98 (2.87)	3.9 (2.2)
Log number of antenatal visits for most recent birth		-3.88 (3.11)	-6.38 (7.31)	-4.68 (5.25)	-2.34 (3.44)
At least one antenatal visit was at medical facility (base=No medical visits)					
	At least one	23.77 (13.82)	23.13 (24.57)	28.96 (17.46)	-17.71 (20.85)
	NA/don't know	9.72 (19.61)	-2.61 (33.18)	30.74 (38.84)	-26.19 (26.65)
	Not last born	55.32 (15.55)***	65.72 (25.67)*	51.8 (21.26)*	9.42 (22.43)
Mother participates in health decisions		-6.27 (6.76)	-2.34 (13.65)	-7.88 (9.4)	-5.17 (11.4)
Log number of decisions made		-0.04 (3.76)	-7.56 (6.55)	-1.03 (7.02)	6.01 (4.66)
Child's gender (base=male)		16.53 (4.07)***	25.82 (7.31)**	13.51 (6.19)*	17.05 (5.49)**
Child's age in months		-56.82 (7.6)***	-72.85 (12.2)***	-56.06 (12.58)***	-35.25 (10.41)**
Child's size at birth (base=Very small)					
	Smaller than average	-16.54 (39.66)	-159.54 (112.58)	3.26 (43.9)	35.26 (17.53)*
	Average	7.57 (38.29)	-116.84 (107.93)	19.04 (43.57)	52.7 (16.79)**
	Larger than average	16.45 (38.33)	-114.92 (108.02)	24.77 (43.93)	75.28 (16)***
	Very large	27.84 (35.56)	-93.09 (99.35)	26.53 (47.62)	87.72 (20.88)***
Child's anaemia level (base=None)					
	Mild	-14.62 (7.95)	0.82 (16.92)	-30.66 (10.8)**	-6.66 (8.49)
	Moderate	-42.09 (7.55)***	-28.68 (13.54)*	-53.21 (12.34)***	-37.13 (8.95)***
	Severe	-32.31 (19.6)	10.03 (34.85)	-54.57 (18.63)**	-132.54 (43.28)**
	Not measured	-20.73 (6.26)**	-19.62 (12.16)	-27.74 (10.08)**	-8.91 (6.39)
Child had fever		-9 (7.38)	-3.74 (17.9)	-9.44 (9)	-20.95 (8.15)*
Child had diarrhoea		-13.05 (6.88)	-33.03 (15.35)*	-3.34 (8.95)	3.13 (9.85)
Child had cough		-12.5 (10.52)	-22.75 (27.16)	-31.42 (14.56)*	7.53 (9.72)
Log number of times fed solid food in last 24 hours		3.52 (1.09)**	4.1 (1.85)*	1.28 (1.75)	5.73 (1.34)***
Child has received Vit. A supplements		2.59 (5.71)	15.17 (8.74)	0.07 (9.43)	-9.75 (8.84)
Log number of vaccines child has received		5.04 (6.97)	10.25 (14.02)	3.95 (8.68)	9.64 (11.58)
Child has received 3 doses of DPT vaccine		-9.45 (8.29)	-31 (15.27)*	0.13 (11.53)	-0.17 (13.08)
Child's breastfeeding status (base=breastfed exclusively)					
	Only plain water	35.12 (52.63)	342.59 (130.7)*	-4.52 (71.33)	-66.55 (37.03)
	Not exclusively breastfed	-21.95 (25.22)	-4.94 (44.23)	2.35 (56.67)	-87.68 (29.33)**
	Not currently breastfed	-11.83 (22.19)	12.05 (29.47)	22.88 (52.01)	-109.04 (25.26)***
	Never breastfed	2.18 (25.35)	0.7 (36.81)	56.33 (56.65)	-87.57 (30.07)**
Complementary foods given to breastfeeding child (base=no breast or no food)					
	Breast and food	2.15 (13.46)	4.72 (36.96)	0.77 (18.97)	1.81 (13.58)
	Not applicable	No obs.	No obs.	No obs.	No obs.
Total children born		-2.87 (1.82)	-1.73 (2.78)	-2.78 (2.85)	-4.6 (2.35)
Log wealth		18.76 (4.14)***	23.32 (8.47)**	12.66 (5.88)*	22.79 (6.33)***
Household head gender (base=male)		-5.16 (5.02)	-16.47 (10.62)	-7.57 (8.38)	6.96 (5.88)
Household head highest education (base=No education)					
	Incomplete primary	7.5 (6.16)	13.53 (10.61)	5.09 (8.7)	-3.67 (8.42)
	Complete Primary	6 (9.29)	-2.85 (15.41)	0.43 (14.14)	15.15 (13.05)
	Incomplete secondary	10.09 (8.87)	3.56 (18.58)	15.41 (12.51)	-9.2 (12.42)
	Complete secondary	20.13 (13.64)	-39.31 (22.58)	37.2 (23.64)	16.76 (17.19)
	Higher	67.21 (16.79)***	80.59 (41.39)	67.31 (33.7)*	43.58 (19.38)*
	Don't know	7.17 (14.71)	13.86 (41.48)	22.27 (23.58)	-9.38 (17.62)
Religion (base=Catholic)					
	Islamic	-3.94 (7.83)	0.83 (9.1)	-20.35 (16.53)	-2.45 (21.12)
	Zion	2.65 (7.95)	-8.9 (40.86)	4.7 (11.54)	-10.94 (9.07)
	Evangelical/ Pentecostal	1.4 (6.51)	13.38 (32.36)	-1.91 (8.72)	-6.47 (8.4)
	No religion	6.85 (7.8)	32.16 (40.27)	2.46 (9.7)	2.27 (11.2)
	Other	11.63 (10.75)	-32.69 (20.2)	10.1 (13.95)	3 (12.3)
Location (base=urban)		7.18 (7.11)	1.35 (13.98)	13.37 (10.84)	-2.53 (7.68)
Province (base=Niassa)					
	Cabo Delgado	0.21 (12.29)	1.59 (13.31)		
	Nampula	-10.12 (13.73)	-10.36 (14.51)		
	Zambezia	25.88 (12.77)*			
	Tete	8.78 (13.04)		-21.72 (12.42)	
	Manica	13.31 (14.28)		-11.86 (14.59)	
	Sofala	28.87 (13.12)*		1.29 (13.17)	
	Inhambane	14.38 (12.9)			
	Gaza	35.49 (12.19)**			11.13 (8.99)
	Maputo Province	26.92 (13.74)			5.2 (11.55)
	Maputo City	29.87 (14.61)*			5.83 (13.16)
Intercept		-3263.4 (327.29)***	-2298.43 (696.28)**	-3544.67 (458.09)***	-4015.17 (388.72)***
N		8,019	2,151	3,341	2,527
R^2		0.13	0.13	0.10	0.18

Table 37: Probit regression results for child death models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Mother's age at birth (base=under 18)					
	18-24	-0.14 (0.09)	-0.53 (0.19)**	-0.08 (0.13)	0.21 (0.14)
	25-34	-0.21 (0.11)*	-0.55 (0.23)*	-0.19 (0.15)	0.08 (0.17)
	35-44	-0.36 (0.14)*	-0.78 (0.31)*	-0.44 (0.19)*	0.26 (0.23)
	45-49	-0.28 (0.26)	-0.79 (0.6)	-0.16 (0.32)	0.21 (0.7)
Mother was married before 18 (base=No)		0 (0.05)	0.1 (0.11)	-0.02 (0.07)	0 (0.08)
Child's gender (base=Male)		-0.07 (0.04)	-0.12 (0.1)	-0.06 (0.06)	-0.11 (0.07)
Mother's highest schooling (base=No education)					
	Incomplete primary	0.05 (0.06)	-0.06 (0.15)	0.07 (0.08)	0.02 (0.12)
	Complete Primary	0.07 (0.13)	0.19 (0.29)	0.05 (0.2)	0.1 (0.19)
	Incomplete secondary	-0.24 (0.13)	0.1 (0.39)	-0.3 (0.18)	-0.26 (0.19)
	Complete secondary	-0.08 (0.23)	-0.03 (0.51)	-0.17 (0.36)	-0.1 (0.34)
	Higher	-0.3 (0.38)	No obs.	0.29 (0.46)	-0.74 (0.45)
	Don't know	0.26 (0.33)	No obs.	No obs.	0.45 (0.33)
Mother's literacy (base=Able to read only parts of sentence)					
	Able to read whole sentence	-0.04 (0.09)	0.1 (0.21)	-0.11 (0.14)	-0.13 (0.14)
	No card with required language	0.01 (0.08)	-0.37 (0.25)	0.13 (0.12)	-0.07 (0.11)
	Blind/visually impaired	0.14 (0.57)		0.2 (0.62)	No obs.
Mother's anaemia level (base=None)					
	Mild	0.09 (0.05)	-0.13 (0.11)	0.15 (0.07)*	0.21 (0.09)*
	Moderate	0.1 (0.06)	-0.01 (0.17)	0.07 (0.08)	0.36 (0.11)**
	Severe	0.33 (0.21)	-0.36 (0.41)	0.47 (0.28)	0.32 (0.29)
	Not measured	0.06 (0.25)	0.45 (0.67)	-0.16 (0.59)	0 (0.33)
Log of mother's height		-0.68 (0.59)	0.44 (1.4)	-0.21 (0.81)	-3.42 (0.95)***
Log of interval between this and the mother's last child		-0.08 (0.02)***	-0.1 (0.04)*	-0.07 (0.03)*	-0.14 (0.03)***
Log number of antenatal visits for most recent birth		-0.01 (0.03)	0.08 (0.11)	-0.03 (0.05)	-0.03 (0.05)
At least one antenatal visit was at medical facility (base=No medical visits)					
	At least one	-0.13 (0.1)	-0.23 (0.26)	-0.1 (0.12)	-0.45 (0.22)*
	NA/don't know	-0.34 (0.29)	No obs.	0.03 (0.57)	-0.56 (0.41)
	Not last born	0.22 (0.1)*	-0.06 (0.25)	0.34 (0.12)**	-0.14 (0.24)
Mother participates in health decisions		0.1 (0.06)	-0.03 (0.13)	0.22 (0.09)*	-0.09 (0.15)
Log number of decisions made		-0.05 (0.04)	0.11 (0.09)	-0.13 (0.06)*	-0.02 (0.07)
Total children born		0.04 (0.02)*	0.1 (0.04)*	0.02 (0.02)	0.13 (0.04)**
Log wealth		0.04 (0.04)	0.08 (0.09)	0 (0.06)	0.08 (0.09)
Household head gender (base=male)		0.04 (0.06)	0.09 (0.13)	0.02 (0.08)	0.01 (0.08)
Household head highest education (base=No education)					
	Incomplete primary	0.01 (0.06)	0 (0.14)	-0.01 (0.08)	0.14 (0.13)
	Complete Primary	-0.09 (0.1)	-0.18 (0.24)	-0.09 (0.14)	0.11 (0.18)
	Incomplete secondary	-0.1 (0.09)	-0.26 (0.23)	-0.1 (0.12)	-0.02 (0.18)
	Complete secondary	0.11 (0.17)	0.28 (0.37)	-0.05 (0.24)	0.32 (0.27)
	Higher	0.28 (0.21)	0.89 (0.49)	0.03 (0.35)	0.38 (0.3)
	Don't know	0.22 (0.16)	0.39 (0.49)	0.27 (0.24)	0.16 (0.24)
Religion (base=Catholic)					
	Islamic	0.07 (0.09)	0.08 (0.12)	-0.05 (0.18)	0.04 (0.28)
	Zion	-0.02 (0.07)	No obs.	0.03 (0.09)	-0.14 (0.13)
	Evangelical/ Pentecostal	-0.1 (0.08)	-0.09 (0.42)	-0.1 (0.1)	-0.14 (0.12)
	No religion	-0.06 (0.09)	No obs.	-0.05 (0.1)	-0.03 (0.15)
	Other	-0.11 (0.09)	-0.37 (0.45)	-0.18 (0.12)	0.03 (0.14)
Location (base=urban)		-0.03 (0.06)	0 (0.12)	-0.03 (0.07)	-0.04 (0.13)
Province (base=Niassa)					
	Cabo Delgado	-0.06 (0.13)	-0.02 (0.15)		
	Nampula	-0.06 (0.12)	0.01 (0.13)		
	Zambezia	0.24 (0.11)*			
	Tete	0.39 (0.12)**		0.13 (0.09)	
	Manica	0.26 (0.12)*		-0.02 (0.09)	
	Sofala	0.22 (0.12)		-0.05 (0.09)	
	Inhambane	-0.03 (0.16)			
	Gaza	0.22 (0.14)			0.32 (0.14)*
	Maputo Province	0.2 (0.15)			0.29 (0.19)
	Maputo City	0.19 (0.14)			0.28 (0.19)
Intercept		1.59 (3.02)	-4.34 (7.15)	0 (4.06)	14.81 (4.93)**
N		11,008	2,694	4,793	3,427
% correctly classified		0.92	0.91	0.90	0.93

A.4 MATERNAL HEALTH OUTCOMES CONTROLLED MODEL RESULTS

Table 38: Probit regression results for child death models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Mother age group & Married under 18					
	Under 18 & Not married under 18	0.21 (0.15)	0.34 (0.25)	0.11 (0.31)	0.1 (0.18)
	18-24 & Not married under 18	-0.16 (0.08)*	-0.15 (0.16)	-0.15 (0.11)	-0.22 (0.13)
	18-24 & Married under 18	-0.15 (0.07)*	-0.08 (0.12)	-0.18 (0.11)	-0.19 (0.14)
	25-34 & Not married under 18	-0.11 (0.08)	-0.22 (0.17)	-0.01 (0.11)	-0.12 (0.14)
	25-34 & Married under 18	-0.05 (0.09)	-0.18 (0.17)	0.07 (0.13)	-0.09 (0.15)
	35-44 & Not married under 18	-0.12 (0.1)	-0.18 (0.21)	-0.08 (0.14)	-0.02 (0.16)
	35-44 & Married under 18	-0.09 (0.12)	-0.2 (0.23)	-0.01 (0.19)	0.03 (0.2)
	45-49 & Not married under 18	-0.04 (0.17)	0.49 (0.33)	-0.07 (0.22)	-0.64 (0.45)
	45-49 & Married under 18	-0.39 (0.41)	-1.03 (0.6)	-0.15 (0.52)	No obs.
Total children born		-0.03 (0.01)*	0 (0.03)	-0.04 (0.02)*	-0.07 (0.02)**
Log wealth		0.4 (0.04)***	0.39 (0.08)***	0.45 (0.06)***	0.27 (0.06)***
Household head gender (base=male)		0.14 (0.05)**	0.18 (0.1)	0.16 (0.07)*	0.03 (0.06)
Household head highest education (base=No education)					
	Incomplete primary	0.05 (0.06)	-0.06 (0.15)	0.07 (0.08)	0.02 (0.12)
	Complete Primary	0.07 (0.13)	0.19 (0.29)	0.05 (0.2)	0.1 (0.19)
	Incomplete secondary	-0.24 (0.13)	0.1 (0.39)	-0.3 (0.18)	-0.26 (0.19)
	Complete secondary	-0.08 (0.23)	-0.03 (0.51)	-0.17 (0.36)	-0.1 (0.34)
	Higher	-0.3 (0.38)	No obs.	0.29 (0.46)	-0.74 (0.45)
	Don't know	0.26 (0.33)	No obs.	No obs.	0.45 (0.33)
Mother's literacy (base=Able to read only parts of sentence)					
	Incomplete primary	0.15 (0.05)**	0.2 (0.09)*	0.18 (0.07)*	-0.02 (0.08)
	Complete Primary	0.5 (0.09)***	0.76 (0.17)***	0.47 (0.13)***	0.12 (0.13)
	Incomplete secondary	0.53 (0.1)***	0.41 (0.18)*	0.63 (0.16)***	0.23 (0.14)
	Complete secondary	0.58 (0.17)**	0.39 (0.24)	0.73 (0.29)*	0.27 (0.28)
	Higher	0.34 (0.22)	0.65 (0.47)	0 (0.42)	0.24 (0.28)
	Don't know	0.07 (0.13)	0.11 (0.31)	0.35 (0.23)	-0.23 (0.15)
Religion (base=Catholic)					
	Islamic	0.04 (0.09)	-0.02 (0.11)	0.26 (0.2)	0.4 (0.35)
	Zion	-0.14 (0.09)	0.02 (0.62)	-0.12 (0.12)	-0.17 (0.11)
	Evangelical/ Pentecostal	-0.13 (0.08)	0.15 (0.24)	-0.15 (0.11)	-0.04 (0.12)
	No religion	-0.28 (0.1)**	-0.18 (0.33)	-0.33 (0.13)*	-0.14 (0.13)
	Other	-0.05 (0.1)	0.19 (0.22)	-0.08 (0.13)	0.1 (0.13)
	Not measured	0.06 (0.25)	0.45 (0.67)	-0.16 (0.59)	0 (0.33)
Location (base=urban)		-0.41 (0.09)***	-0.56 (0.16)**	-0.45 (0.14)**	-0.14 (0.1)
Province (Base=Niassa)					
	Cabo Delgado	-0.55 (0.18)**	-0.55 (0.19)**		
	Nampula	-0.18 (0.16)	-0.21 (0.17)		
	Zambezia	-0.71 (0.15)***			
	Tete	0 (0.17)		0.74 (0.14)***	
	Manica	0.24 (0.17)		0.94 (0.15)***	
	Sofala	0.29 (0.16)		1 (0.14)***	
	Inhambane	-0.18 (0.16)			
	Gaza	0.08 (0.16)			0.29 (0.11)*
	Maputo Province	0.02 (0.17)			0.44 (0.12)***
	Maputo City	-0.02 (0.17)			0.58 (0.14)***
Intercept		-3.65 (0.52)***	-3.48 (0.94)***	-4.93 (0.75)***	-2.23 (0.71)**
N		11093	2797	4825	3469
Class		0.73	0.67	0.73	0.78

Table 39: Tobit regression results for number of children born in past three years models

VARIABLE	DESCRIPTION	NATIONAL	NORTHERN REGION	CENTRAL REGION	SOUTHERN REGION
Mother age group & Early children group					
	15-24 & Kids before 15	0.78 (0.02)***	0.91 (0.04)***	0.93 (0.03)***	-0.06 (0.05)
	15-24 & Kids 15-18	0.94 (0.01)***	0.81 (0.02)***	0.72 (0.02)***	1.06 (0.01)***
	25-34 & No early kids	0.86 (0.01)***	0.7 (0.02)***	0.98 (0.01)***	0.78 (0.01)***
	25-34 & Kids before 15	0.51 (0.03)***	-0.41 (0.05)***	0.75 (0.05)***	0.88 (0.03)***
	25-34 & Kids 15-18	0.75 (0.01)***	0.5 (0.03)***	0.91 (0.02)***	0.73 (0.02)***
	35-44 & No early kids	0.25 (0.01)***	0.52 (0.02)***	0.01 (0.02)	0.11 (0.02)***
	35-44 & Kids before 15	-0.38 (0.03)***	-0.19 (0.06)**	-0.56 (0.05)***	-0.62 (0.07)***
	35-44 & Kids 15-18	-0.17 (0.02)***	0.22 (0.04)***	-0.42 (0.03)***	-0.34 (0.03)***
	45-49 & No early kids	-0.88 (0.02)***	-1.14 (0.04)***	-0.43 (0.03)***	-7.03 (0.06)***
Mother's age group & Child marriage group					
	15-24 & Married before 15	-0.1 (0.02)***	-0.21 (0.03)***	0.08 (0.02)**	-0.45 (0.04)***
	15-24 & Married 15-18	0.62 (0.01)***	0.46 (0.02)***	0.74 (0.01)***	0.57 (0.02)***
	25-34 & No child marriage	0.03 (0.01)**	0.11 (0.02)***	0.09 (0.01)***	-0.17 (0.01)***
	25-34 & Married before 15	-0.06 (0.02)**	-0.13 (0.04)**	0.22 (0.03)***	-0.29 (0.03)***
	25-34 & Married 15-18	No obs.	No obs.	No obs.	No obs.
	35-44 & No child marriage	0.17 (0.01)***	-0.19 (0.02)***	0.61 (0.02)***	0.03 (0.02)
	35-44 & Married before 15	-0.06 (0.03)*	-0.29 (0.04)***	0.16 (0.04)***	-0.18 (0.06)**
	35-44 & Married 15-18	No obs.	No obs.	No obs.	No obs.
	45-49 & No child marriage	0.38 (0.02)***	0.7 (0.05)***	0.19 (0.03)***	5.57 (0.06)***
	45-49 & Married before 15	0.8 (0.05)***	1.78 (0.09)***	0.15 (0.09)	6.43 (0.07)***
Mother's age group & Early children group & Child marriage group					
	15-24 & Kids under 15 & Married under 15	0.31 (0.03)***	0.1 (0.05)	0.12 (0.04)**	1.57 (0.07)***
	15-24 & Kids under 15 & Married 15-18	-0.56 (0.02)***	-0.63 (0.03)***	-0.95 (0.02)***	0.73 (0.05)***
	15-24 & Kids 15-18 & Married under 15	0.18 (0.02)***	0.22 (0.03)***	0.36 (0.02)***	0.5 (0.04)***
	15-24 & Kids 15-18 & Married 15-18	-0.49 (0.01)***	-0.46 (0.03)***	-0.24 (0.02)***	-0.41 (0.02)***
	25-34 & Kids under 15 & Married under 15	0.32 (0.03)***	1.3 (0.05)***	-0.16 (0.05)**	0.14 (0.05)**
	25-34 & Kids under 15 & Married 15-18	0.05 (0.02)**	0.77 (0.03)***	0.24 (0.03)***	-0.83 (0.04)***
	25-34 & Kids 15-18 & Married under 15	0.19 (0.02)***	0.33 (0.03)***	-0.15 (0.02)***	0.34 (0.04)***
	25-34 & Kids 15-18 & Married 15-18	0.1 (0.01)***	0.29 (0.03)***	0.08 (0.02)***	-0.15 (0.02)***
	35-44 & Kids under 15 & Married under 15	0.54 (0.04)***	0.35 (0.07)***	0.71 (0.06)***	0.54 (0.09)***
	35-44 & Kids under 15 & Married 15-18	-0.41 (0.02)***	0.32 (0.04)***	No obs.	-0.2 (0.04)***
	35-44 & Kids 15-18 & Married under 15	0.39 (0.03)***	0.37 (0.05)***	0.4 (0.04)***	0.37 (0.05)***
	35-44 & Kids 15-18 & Married 15-18	0.3 (0.02)***	-0.07 (0.03)*	0.73 (0.03)***	0.12 (0.03)***
	45-49 & Kids under 15 & Married under 15	4.1 (0.12)***	3.56 (0.19)***	4.37 (0.17)***	No obs.
	45-49 & Kids under 15 & Married 15-18	No obs.	No obs.	No obs.	No obs.
	45-49 & Kids 15-18 & Married under 15	-0.88 (0.07)***	-0.71 (0.12)***	-0.75 (0.1)***	-1.35 (0.12)***
	45-49 & Kids 15-18 & Married 15-18	0.18 (0.04)***	0.31 (0.07)***	-0.04 (0.06)	5.45 (0.07)***
Log wealth		-0.16 (0)***	-0.17 (0)***	-0.15 (0)***	-0.2 (0)***
Household head gender (base=male)		-0.17 (0.01)***	-0.15 (0.01)***	-0.2 (0.01)***	-0.15 (0.01)***
Household head highest education (base=No education)					
	Incomplete primary	0.05 (0.01)***	0.05 (0.02)**	0.1 (0.01)***	-0.05 (0.01)***
	Complete Primary	0.03 (0.01)***	-0.17 (0.01)***	0.17 (0.01)***	0.04 (0.01)**
	Incomplete secondary	0.11 (0.01)***	0.18 (0.01)***	0.16 (0.01)***	0.04 (0.01)***
	Complete secondary	0.09 (0.01)***	0.02 (0.02)	0.29 (0.01)***	-0.09 (0.01)***
	Higher	-0.01 (0.01)	0.2 (0.02)***	0.03 (0.02)	-0.18 (0.02)***
	Don't know	0.15 (0.01)***	0.03 (0.02)*	0.08 (0.01)***	0.17 (0.01)***
Religion (base=Catholic)					
	Islamic	-0.08 (0.01)***	-0.11 (0.01)***	-0.07 (0.01)***	0.03 (0.01)*
	Zion	0.11 (0.01)***	-0.9 (0.02)***	0.11 (0.01)***	0.1 (0.01)***
	Evangelical/ Pentecostal	0.17 (0.01)***	0.2 (0.01)***	0.23 (0.01)***	0.06 (0.01)***
	No religion	0.11 (0.01)***	-0.11 (0.01)***	0.12 (0.01)***	0.16 (0.01)***
	Other	-0.01 (0.01)	-0.1 (0.01)***	0.03 (0.01)***	-0.09 (0.01)***
Location (base=urban)		0.02 (0.01)*	-0.11 (0.02)***	0.06 (0.01)***	0.1 (0.01)***
Province (base=Niassa)					
	Cabo Delgado	-0.08 (0.01)***	-0.09 (0.01)***		
	Nampula	-0.24 (0.01)***	-0.25 (0.02)***		
	Zambezia	-0.19 (0.01)***			
	Tete	-0.21 (0.01)***		0 (0.01)	
	Manica	-0.22 (0.01)***		-0.03 (0.01)**	
	Sofala	-0.3 (0.01)***		-0.09 (0.01)***	
	Inhambane	-0.34 (0.01)***			
	Gaza	-0.21 (0.01)***			0.11 (0.01)***
	Maputo Province	-0.33 (0.01)***			0.06 (0.01)***
	Maputo City	-0.44 (0.01)***			-0.02 (0.01)*
Mother's highest schooling (base=No education)					
	Incomplete primary	-0.07 (0.01)***	-0.08 (0.02)***	-0.07 (0.01)***	-0.02 (0.01)
	Complete Primary	-0.07 (0.01)***	-0.15 (0.01)***	-0.03 (0.01)***	-0.08 (0.01)***
	Incomplete secondary	-0.12 (0.01)***	-0.26 (0.01)***	-0.07 (0.01)***	-0.11 (0.01)***
	Complete secondary	-0.19 (0.01)***	-0.21 (0.02)***	-0.46 (0.02)***	0.02 (0.01)
	Higher	-0.35 (0.02)***	-0.6 (0.04)***	-0.39 (0.02)***	-0.15 (0.03)***
	Don't know	-0.23 (0.01)***	-0.46 (0.02)***	0.23 (0.01)***	-0.25 (0.02)***
Intercept		1.66 (0.01)***	2.05 (0.02)***	1.11 (0.01)***	1.87 (0.02)***
N		13,731	2,954	5,234	5,543

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