

Trends and factors associated with adolescent childbearing in Mozambique: a multilevel analysis

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Trends and factors associated with adolescent childbearing in Mozambique: a multilevel analysis

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Abstract

Adolescent childbearing is one of the social and public health issues in Mozambique and perception of its health and social consequences have attracted the attention of researchers, policy makers and civil society organizations. This paper uses the 1997, 2003 and 2011 DHS data to analyse trends and examine individual- and community-level factors associated with adolescent childbearing in Mozambique. It finds that about 40% of Mozambican female adolescents aged 15-19 years were already mothers or were pregnant at the 2011 survey and this percentage has remained almost unchanged during the last 20 years. It also finds that exposure factors such as early initiation of sexual activity, early marriage and low contraceptive use, are the most important individual factors explaining early childbearing pattern in Mozambique. At community-level, the level of ever use of contraception and exposure to media emerge as the most important factors.

1. Introduction

Adolescent childbearing is among the social and public health issues in many developing countries, particularly in sub-Saharan Africa (Doyle *et al.*, 2012; Mahy & Gupta, 2002; Zabin & Kiragu, 1998). The perception of their health and social consequences (Oyefara, 2009) has drowned the attention of researcher, governments, policy makers and civil society organizations around the world (Chalem *et al.*, 2007). Adolescent childbearing has been associated with negative outcomes for adolescent mothers and their children. Adolescent mothers experience lower self-esteem and have high risk of depression, substance abuse and living in poverty relative to their peers who delay childbearing (Ruedinger & Cox, 2012). Additionally, a pregnancy in the adolescence usually forces girls to a temporary or permanent drop out from school and limits their future economic prospects, earning capacity and over all well-being (United Nations, 2013). Adolescent pregnancy and motherhood are also associated with high infant and maternal mortality and morbidity, postpartum haemorrhage and low births weight (Kate McQueston, Silverman & Glassman, 2013; WHO, 2011).

In Mozambique, a southern African country with a total fertility rate of 5.9 children per woman (INE & MISAU, 2013), early childbearing is among the contributing factor for the observed high fertility since it elongates the duration of the reproductive period (Arnaldo, 2013; Gurmu & Dejene, 2012). The 2011 DHS data show that 40% of adolescents girls in Mozambique were either mothers or pregnant by the time of the survey. Early childbearing is a complex and multidimensional phenomenon and is influenced by biological and social factors (Brito, 2009). From the biological perspective, an anticipation of menarche exposes adolescents to pregnancy at a young age (Pirotta & Schor, 2004). From the social perspective, the social changes in sexuality, characterized by openness and removal of inhibitions and stigma related to sexuality may stimulate sexual activity among adolescents and increase the risk of an early pregnancy or childbearing if adolescents lack adequate knowledge about sexuality and contraception (Brito, 2009; Gama, Szwarcwald & Leal, 2002; Leal, 2006). A better understanding of underlying factors contributing for early childbearing in sub-Saharan Africa and in Mozambique in particular may be useful for the drafting of better policies and programs to address the issue. Building on existing studies in other parts of the world, this paper uses the DHS data to examine trends in adolescent fertility in Mozambique and associated individual- and community-level factors.

2. Early childbearing in sub-Saharan Africa

Early pregnancy or childbearing remains a common phenomenon in the developing world, particularly in the African continent. According to 2010 estimates, 36.4 million women aged 20 to 24 years in developing countries had had their first birth before the age of 18, with more than half (53%) living in the African continent (UNFPA, 2013:3-6). About 16 million adolescent girls between 15 and 19 years of age give birth each year and babies born to adolescent mothers account for roughly 11% of all births worldwide, with 95% occurring in developing countries (WHO, 2012).

Rates of adolescent pregnancy and childbearing are highest in Africa. In most of the 25 African countries included in Hindin's study (Hindin (2012)), more than half of women aged 20-24 years had their first child before age 20, with countries in Africa where more than 20% of women had their first child before age 16. Twenty of 25 countries of the world with the highest rates of adolescent fertility rates are in Africa (United Nations Economic Commission for Africa, 2013). Adolescent fertility rate in Africa, as measured by the number of births per 1000 women aged 15 to 19 years, is 101 children against an average of 56 per 1000 women for the whole of developing countries (Population Reference Bureau, 2013). Estimates from 2010 indicate that at least 25% of women aged 20 to 24 years in Sub-Saharan Africa had their first child before the age of 18, against an average of 19% for developing countries (UNFPA, 2013).

Early childbearing in sub-Saharan Africa has been explained by many factors among which the decrease in the age of menarche and the increasing age at first marriage, early marriage, cultural norms about sexuality and childbearing and low contraceptive use (Doyle *et al.*, 2012; Meekers, 1994; Yavuz, 2010; Zabin & Kiragu, 1998). The decline in age at menarche worldwide and in sub-Saharan Africa puts young girls at risk of an early sexual initiation (Zabin & Kiragu, 1998), and sexual activity at a young age, before girls acquire adequate information on potential health risks, self-protection skills or full access to reproductive health services increases their risk of unplanned and unwanted pregnancies (Gurmu & Dejene, 2012; United Nations, 2013). Social changes resulting in some relaxation of the inhibition and stigma related to sexuality and a weakening of parental control over adolescents and exposure to the outside world might stimulate sexual activity among adolescents and increase the risk of an early pregnancy that may lead to an early marriage or childbearing (Gama *et al.*, 2002; Magadi & Agwanda, 2009).

The prevalence of early marriages has also been a contributing factor for early childbearing in sub-Saharan Africa. Although the age at first marriage has been increasing since the 1990's (Yavuz, 2010), sub-Saharan Africa remains the region of the world where women get marriage at a young age (Population Reference Bureau, 2013). By getting marriage at a young age, young girls may be pressured for childbearing by the social expectation of having a child immediately after marriage (National Research Council, 1993).

3. Data and Methods

This paper is based on the analysis of the data obtained from the 1997, 2003 and 2011 Mozambique Demographic and Health surveys (DHS). The surveys were conducted by the National Institute of Statistics in collaboration with the Ministry of Health and all are nationally representative and have been implemented to allow analysis for the country as a whole and separately by urban-rural areas of residence and by province. The 1997 DHS interviewed 8,779 women 15 to 49 years and 2,335

men aged 15 to 64 years, corresponding to response rates of 92% and 81%, respectively (INE & MISAU, 1998); the 2003 survey interviewed 12,418 women 15 to 49 years and 2,900 men aged 15 to 64 years, corresponding to response rates of 91% and 81%, respectively (INE & MISAU, 2005); and the 2011 survey interviewed 13,718 women 15 to 49 years and 4,130 men aged 15 to 64 years, corresponding to response rates of 99% and 98%, respectively (INE & MISAU, 2013). The present study only uses data from women aged 15 to 24 years at the time of each survey.

Dependent (outcome) variables

For the purpose of this analysis early childbearing is defined as that occurring before the age of 20 years. Two measures of adolescent childbearing are used: the percentage of women aged 15-19 who are already mothers or are pregnant at the time of survey and the percentage of women aged 18-24 who had their first child before the age of 18. For the first measure the dependent variable is whether or not adolescents (15-19) are already mothers or pregnant. For the second measure the dependent variable is whether or not women aged 18-24 had their first child before they were 18 years old. The adolescents who were already mothers or pregnant at the survey or the women 18-24 who had their first child before the age of 18 were coded as 1, otherwise they were coded as 0. Thus, in total, the numbers of women included in the analysis are presented in Table 1.

[Table 1 about here]

Independent variables

Individual-level variables included age, years of women's schooling, women's occupation, place of residence, age at first sexual intercourse, age at first marriage, religion, household wealth index, contraceptive experience and media exposure. Age is the reported age at the survey. Women's schooling was categorized into "No schooling", "1-7 years" and "8 or more years of schooling"; women's occupation was categorized into "No occupation", "low occupational jobs" and "high occupational jobs". Age at first sexual intercourse and first marriage were categorized into three categories, "Less than 15", "15-16" and "17 and over"; religion is the self-reported religion at the survey and was categorized in the following categories: Catholic, Protestant, Muslims, Zionist, Other religion and No religion.

Media exposure is a composite variable derived from questions on the frequency a respondent read newspaper, listened to radio and watched television. Respondents were considered exposed to media if they read newspaper, listened to radio or watched television at least once a week. Contraceptive experience expresses whether or not an adolescent or a woman has ever used any contraception; the DHS wealth index, categorized as poor, middle and rich.

Community-level variables were measured at the cluster (enumeration area) level and included the percentage of women in the community who have ever used any method of contraception; the percentage of poor (poorest and poorer) households in the community, the percentage of women in the community exposed to media, the percentage of women in the community in high occupational jobs and the average number of years of women's schooling in the community.

Statistical analysis

Multilevel random intercept logistic regression models were fitted with *xtmelogit* command in *Stata* version 14 to the three DHS data separately and to a pooled data set to examine individual and community factors on the odds ratios of an adolescent aged 15-19 years being already mother or pregnant at the time of the survey and the odds that a woman aged 18-24 years had her first child before the age of 18 years. The fitted models can be formally expressed by the following equation:

$$\log \left[\frac{P_{ij}}{(1 - P_{ij})} \right] = \beta_0 + \beta_1 X_{1ij} + \dots + \beta_k X_{kij} + \varepsilon_{ij} + U_j$$

where $\log[P_{ij}/(1 - P_{ij})]$ is the log-odds of having had a child in adolescence for women i in j th community; β_1, \dots, β_k are the vectors of coefficients; X_{ij}, \dots, X_{kij} are vectors of women and community level covariates; ε_{ij} and U_j are women and community level random effects, respectively. Because the 1997 DHS survey did not collect information about household wealth index, all analyzes that include the 1997 survey data do not include household wealth index and the percentage of poor households in the community as predictors.

4. Results

Bivariate analysis

Table 2 presents women aged 15-19 and 18-24 years by socioeconomic and demographic characteristics. During the last two decades women's education has improved in Mozambique. For instance, the percentage of adolescents aged 15-19 years with no schooling reduced from 33 per cent in 1997 to 13 per cent in 2011, and the percentage of those with eight or more years of schooling increased from 3.9 per cent in 1997 to about 26 per cent in 2011 (Table 2). Most adolescents or women are either unoccupied or in low occupational jobs. The predominant religions among Mozambican women are Catholic, Muslim, Protestant and Zionist, accounting for more than 80% of women. A significant percentage (10 to 20%) of women are not affiliated to any religion and about 3% belong to other religions. One-third of women lived in poor households and at least 35% of adolescents and women aged 18-24 years have been exposed to media, with this percentage raising above 75% after 2003.

Despite significant improvements in access to education among youth and adolescents, particularly in urban areas (INE & MISAU, 1998, 2005, 2013), the events related to the transition to adulthood (sexual initiation, marriage and childbearing) still happen at a young age in Mozambique. Half of Mozambican women are sexually active by the age of 16 and have been married or been mothers by the age of 19 years. In 2011, for instance, about 40 percent of adolescents aged 15 to 19 years were already mothers or were pregnant; more than half of women aged 18-24 years had their first birth before age 18 and this percentage is similar in the three DHS showing no trends towards late onset of childbearing in Mozambique. The hazard curves of first birth by age for the three surveys almost overlap meaning little change in the risk of first birth during the last two decades (Figure 1).

[Table 2 and Figure 1 about here]

In a context where either sexual initiation or first marriage are early, and where there is a social expectation that a marriage girl should immediately get pregnant and have a child (Arnaldo, Frederico & Dade, 2014) the risk of adolescent pregnancy and childbearing is even high if youth and adolescents do not use family planning methods to prevent unplanned and unwanted pregnancies. Although the level of knowledge of contraceptive methods among Mozambican women is very high only 21% of ever sexually active adolescents aged 15-19 and 29% of women 18-24 reported to have ever used any method of contraception in 2011 and only 15% and 21% respectively, were currently using contraception at the time of survey. Because of early beginning of childbearing, at least one of the 6 children that a Mozambican woman has during her reproductive period was born in adolescence. As a result, adolescent fertility rate was estimated at 170 children per thousand adolescents, and is high in rural compared to urban areas (Figure 2). This rate contributes to the overall total fertility rate by about 14%, among the highest contributions in the world (United Nations, 2013).

[Figure 2 about here]

Multilevel Analysis

Logistics regression results of the effects of individual and community-level predictors are presented in Tables 3 and 4. The results are presented in four full models: models I to III present the results from each of the three DHS data (1997, 2003 and 2011), and Model IV presents the full model based on the combined (pooled) data set from the three DHS surveys. Table 3 presents the odds ratios of an adolescent aged 15-19 years being a mother or pregnant and Table 4 the odds ratios of a woman aged 18-24 years at the time of the survey having had the first child before the age of 18 years.

a. Individual level effects

The results in Tables 3 and 4 show that year of the survey, years of schooling, age at first sexual intercourse and marriage, contraceptive use experience and women's media exposure have significant effects on the risk of an early childbearing in Mozambique.

The models fitted to the combined data set show that adolescents and women interviewed in 2003 and 2011 have significantly different odds of adolescent motherhood compared to their counterparts interviewed in 1997, indicating some change of adolescent childbearing over time. The results are somewhat contradictory: the model fitted to adolescents aged 15-19 years show high odds of adolescent motherhood in women interviewed in 2003 and 2011 compared to women interviewed in 1997 while the model fitted to women aged 18-24 years shows lower odds in women interviewed in later survey compared to those interviewed in earlier survey. It could be that adolescent childbearing is increasing among young women as they engage in unprotected sexual activity.

Consistent with the expectation, women with some years of schooling were observed to have less risk of adolescent childbearing in all models, but only having 8 or more years of schooling was statistically significant; for instance, the odds of adolescent motherhood for an adolescent or a woman aged 18-24 years with 8 or more years of schooling were at least 40% lower than those of their uneducated counterparts.

Women with some occupation, particularly those with high occupational jobs are observed to have significantly high odds of adolescent motherhood compared to unoccupied adolescents and women. Since most of adolescent and young women with no occupation are in school, this results may suggest that being out of school make adolescent more vulnerable to an adolescent pregnancy or that those who have had an unwanted pregnancy or child may be forced to work in order to raise their children.

The early a woman initiate sexual activity or get married the greater is the risk of adolescent childbearing. The odds of adolescent motherhood among women who delay sexual intercourse beyond 15 years are at least 33% less than those who become sexually active before age 15. The odds are even lower for women who postpone sexual initiation beyond 16 years with the odds being 30% those of women initiating before age 15 (Table 4). Marrying late, particularly after the age of 17 reduces the risk of adolescent motherhood. The odds of adolescent motherhood for women who married between 15 and 16 years are less than half those of women who married before 15 (Table 4).

Religious affiliation is observed to have less or no effect on the odds of adolescent childbearing in table 3. However, the results in models fitted to women aged 18-24 years (Table 4) show that women affiliated to other than the Catholic religion are generally more likely to experience adolescent motherhood than the Catholics but the difference is statistically significant only for Protestants, Zionists and women

with no religion and in models III and IV. These differences are not clear but religious differences in demographic behaviour have usually been explained by compositional differences of members of different religious groups or the degree to which they tolerate adolescent sexual activity. However, given the high religious mobility shaping religious practices in Mozambique (Agadjanian, 1999), women's religious affiliation at the time of survey may not necessarily corresponded to their religious affiliation at their adolescence or the time they had their first child.

Contraceptive experience is associated with high risk of adolescent childbearing among women aged 18-24 years. The odds of adolescent motherhood for women with contraceptive experience are about two times the odds of women with no experience of contraception (Table 4). Given that there is no information on the age of first use of contraception, these results suggest that women may have adopted contraception after experiencing an unwanted and unplanned pregnancy or childbearing. The fact that contraceptive use among adolescents is very low (see Table 2) supports this idea.

Media exposure has a negative effect on the risk of adolescent childbearing but it is only significant in models fitted to women aged 18-24 years. For instance, model II in Table 4 shows that women exposed to media were about 32% less likely to have had a child before age 18 in comparison to their counterparts who were not exposed to any media.

After controlling for other factors, women's household wealth index generally did not show a significant effect on the odds of adolescent motherhood, but the coefficients were in the expected direction. However, model III in Table 3 shows higher odds of adolescent motherhood for adolescents in the middle household wealth index than their counterparts in poor household wealth index.

b. Community level effects

After controlling for all individual and community factors, only the percentage of women in the community who ever used contraception and the percentage of women in the community exposed to media showed some significant effect on adolescent childbearing. As expected, women residing in communities with higher percentage of women who have ever used contraception were observed to have lower odds of adolescent motherhood but were statistically significant only in two of the fitted models, odds ratios of 0.623 (model IV in table 3) and 0.380 (model II in table 4). Residing in a community with higher percentage of women exposed to media was observed to increase the risk of adolescent motherhood. However, this was only observed in models where wealth index variables were not included¹. In models where these variables were included no significant differences were observed, meaning that the observed effect of the percentage exposed to media may be an artefact of household wealth conditions.

¹ Model I, fitted to this dataset, and model IV, fitted to the combined dataset, did not include wealth index variables because are not available from the 1997 DHS data set.

The other community variables, percentage of poor households, percentage of women in high occupational jobs and the average years of schooling in the community did not show significant effect on adolescent childbearing but the coefficients are in the expected direction.

Discussion

Reducing early childbearing is an important challenge for Mozambique and many other countries in sub-Saharan Africa. Half of the Mozambican women have been married or have been mothers by age 19 (INE & MISAU, 2013), putting adolescents at risk of an unwanted pregnancy, unsafe abortion or HIV infection. This paper was aimed at examining trends in adolescent childbearing and associated individual- and community- level factors in Mozambique. The results shows that despite improvement in adolescent schooling, women in Mozambique start their childbearing life very early and this pattern has not changed in the last two decades. Multilevel logistic regression analysis results show that at the individual-level, exposure factors, that is, rapid progression to sexual activity and marriage and low use of contraception are the most important factors in explaining childbearing pattern in Mozambique. The highest depressing effect on early childbearing is played by the postponement of sexual initiation and marriage. Delaying sexual initiation or marriage for ages beyond 16 years reduces the odds of childbirth before age 18 by as much as 90% (Table 4). This is consistent with findings elsewhere (Gurmu & Dejene, 2012; Meekers, 1994) and suggest that in a context where the protection for unwanted pregnancies is low due to low use of contraception, the beginning of exposure to pregnancy is a very important determinate of adolescent motherhood. This suggests a need for interventions to target young people before age 15 as by that age about one third of adolescents are sexually active.

Adolescent fertility is usually high where the prevalence of early marriage is high as women are exposed at an young age to pregnancy and motherhood (United Nations, 2013). Findings in this study support this preposition. For instance, the odds of adolescent motherhood are significantly high for women who marry early, particularly if they marry before the age of 15 years (Table 3 and 4). However, because sexual activity before marriage is common in Mozambique, marriage may be driven by adolescent pregnancy rather than vice-versa (Neal, Chandra-Mouli & Chou, 2015) particularly in patrilineal societies where the prospective father is supposed to take care of the pregnant girl (Arnaldo *et al.*, 2014). But direction of causality cannot be easily determined on the basis of the available data.

A positive step towards increasing the age at marriage was taken with the approval of the new Family Law in 2001 that fixed the minimum legal age at first marriage at 18 years for both male and females. However, teenagers aged 16 and 17 years can still marry with the consent of parents (República de Moçambique 2001). Beside the increase in the legal age at marriage, during the last three decades a number of policies and programs aimed at reducing early marriage and childbearing have been

designed and implemented targeting young people both at school and in the community, but are yet to make a significant contribution in reducing the prevalence of early marriage and childbearing (Arnaldo, Cau & Maungue, 2015).

Although the use of contraception is considered to be crucial for preventing unwanted and unplanned pregnancies, most of which occur during adolescence, the results in this study suggest a positive association between the contraceptive experience and the risk of an adolescent childbirth. Since we have no information regarding the date a woman started using contraception, a plausible explanation for this pattern is that women started using contraception after having experienced an unwanted pregnancy or birth. In fact, data from the 2009 Mozambique AIDS survey show that only 23 per cent of adolescent aged 15-19 years reported to have used contraception in their first sexual intercourse (INS, INE & ICF Macro, 2010). Making family planning services easily accessible for adolescents who are sexually active and emphasizing schooling to the highest possible level for girls (as well as boys), in addition to mobilizing communities to value education for girls will contribute to reducing teenage marriages and pregnancies (Arnaldo *et al.*, 2015).

Consistent with previous studies elsewhere (Doyle *et al.*, 2012) education was found to reduce the odds of adolescent motherhood. However, the relationship between adolescent childbearing and education can operate in both directions: adolescents with no or low education may be at more risk of adolescent motherhood, or adolescents who become pregnant or mothers may be forced to withdraw from school (Neal *et al.*, 2015). However, data used for this analysis do not allow determining the direction of causality. But in Mozambique, a girl who became pregnant while in school if she wants to continue in school, she is usually transferred from day to night schooling, which makes it even harder to continue with her studies.

References

- Agadjanian, V. 1999. "As Igrejas Zione no espaço sócio-cultural de Moçambique urbano, anos 1980 e 1990." *Lusotopie*: 415-423.
- Arnaldo, C. 2013. "Fecundidade em Moçambique nos últimos 50 anos: alguma mudança?" Pp. 37-60 in C. Arnaldo & B. M. Cau (eds.) *Dinâmicas da População e Saúde em Moçambique*. Maputo: Centro de Pesquisa em População e Saúde.
- Arnaldo, C., B. Cau & H. Maungue. 2015. "Enabling reproductive health policies and programs for achieving the Demographic Dividend in Mozambique." Maputo.
- Arnaldo, C., M. Frederico & A. Dade. 2014. "Tendências e Factores Associados à Maternidade Precoce em Moçambique." Pp. 87-110 in B. M. Cau & C. Arnaldo (eds.) *Adolescentes e Jovens em Moçambique: Uma Perspectiva Demográfica e de Saúde*. Maputo: Centro de Pesquisa em População e Saúde.
- Brito, R. C. d. O. 2009. "Gravidez na Adolescência: Principais informações e consequências para alunas da rede pública estadual." *Monografia de Especialização*. Belo horizonte: Universidade Federal de Minas Gerais, Faculdade de Educação.
- Chalem, E., S. S. Mitsuhiro, C. P. Ferri, M. C. M. Barros, R. Guinsburg & R. Laranjeira. 2007. "Gravidez na Adolescência: perfil sociodemográfico e comportamental de uma população da periferia de São Paulo, Brasil." *Cadernos de Saude Publica* 23(1): 177-186.
- Doyle, A. M., S. N. Mavedzenge, M. L. Plummer & D. A. T. Ross. 2012. "The Sexual Behaviour of Adolescents in sub-Saharan Africa: patterns and trends from national surveys." *Tropical Medicine and International Health* 17(7): 796-807.
- Gama, S. G. N., C. L. Szwarcwald & M. C. Leal. 2002. "Experiência de Gravidez na Adolescência, Factores Associados e Resultados Perinatais entre Puérperas de Baixa Renda." *Caderno Saúde Pública* 18(1): 153 – 161.
- Gurmu, E. & T. Dejene. 2012. "Trends and Differentials of Adolescent Motherhood in Ethiopia: Evidences from 2005 Demographic and Health Survey." *Africa Journal of Reproductive Health* 16(4): 162-174.
- Hindin, M. J. 2012. "The Influence of Women's Early Childbearing on Subsequent Empowerment in sub-Saharan Africa : A Cross-National Meta Analysis." *International Center for Research on Women. Fertility & Empowerment Working Paper Series. 003-2012-ICRW-FE*. Washington, D.C.
- INE & MISAU. 1998. *Moçambique: Inquérito Demográfico e de Saúde - 1997*. Maputo: Instituto Nacional de Estatística.

- INE & MISAU. 2005. *Moçambique: Inquérito Demográfico e de Saúde - 2003*. Maputo: Instituto Nacional de Estatística.
- INE & MISAU. 2013. *Moçambique: Inquérito Demográfico e de Saúde - 2011*. Calverton, Maryland, USA: Ministerio da Saude, Instituto Nacional de Estatística & ICF International.
- INS, INE & ICF Macro. 2010. *Inquérito Nacional de Prevalência, Riscos Comportamentais e Informação sobre o HIV e SIDA em Moçambique 2009*. Calverton, Maryland, EUA: Instituto Nacional de Saúde (INS), Instituto Nacional de Estatística (INE), e ICF Macro.
- Kate McQueston, R. Silverman & A. Glassman. 2013. "The Efficacy of Interventions to Reduce Adolescent Childbearing in Low- and Middle-Income Countries: A Systematic Review." *Studies in Family Planning* 44(4): 369–388.
- Leal, D. M. M. 2006. "Impacto da Gravidez na Adolescência no Distrito da Guarda." *Dissertacao de Mestrado*. Universidade da Beira Interior, Faculdade de Ciências de Saúde.
- Magadi, M. A. & A. O. Agwanda. 2009. "Determinants of Transitions to first Sexual Intercourse, Marriage and Pregnancy among Female adolescents: evidence form south Nyanza, Kenya." *Journal of Biosocial Sciences* 41: 409-427.
- Mahy, M. & N. Gupta. 2002. *Trends and Differentials in Adolescent Reproductive Behavior in sub-Saharan Africa*. DHS Analytical Studies No. 3. Calverton, Maryland: ORC Macro.
- Meekers, D. 1994. "Sexual Initiation and Premarital Childbearing in sub-Saharan Africa." *Population Studies* 48(1): 47-64.
- National Research Council. 1993. *Social Dynamics of Adolescent Fertility in Sub-Saharan Africa*. Washington, D.C.: National Academic Press.
- Neal, S. E., V. Chandra-Mouli & D. Chou. 2015. "Adolescent first births in East Africa: disaggregating characteristics, trends and determinants." *Reproductive Health* 12: 13.
- Oyefara, J. L. 2009. "Socio-Economic Consequences of Adolescent Childbearing in Osun State, Nigeria." *KASBIT Business Journal* 2 (1 & 2): 1-18.
- Pirotta, K. C. M. & N. Schor. 2004. "Intenções Reprodutivas e Práticas de Regulação da Fecundidade entre Universitários." *Revista de Saúde pública* 38(4): 495 – 502.
- Population Reference Bureau. 2013. "2013 World's Youth Data Sheet." <http://www.prb.org/pdf13/youth-data-sheet-2013.pdf> (Acedido em 01.09.2014).

Ruedinger, E. & J. E. Cox. 2012. "Adolescent childbearing: consequences and interventions." *Current Opinion in Pediatrics* 24(4): 446 – 452.

UNFPA. 2013. "Maternidade Precoce: enfrentando o desafio da gravidez na adolescência." United Nations Fund for Population Activities. New York.

United Nations. 2013. *Adolescent Fertility since the International Conference on Population and Development (ICPD) in Cairo*. New York: Population Division, Department of Economic and Social Affairs.

United Nations Economic Commission for Africa. 2013. "Adolescent and Youth Fertility in Africa: Trends, Disparities and Challenges." *Policy Brief No. 7*. Addis Ababa.

WHO. 2011. *WHO Guidelines on Preventing Early Pregnancy and Poor Reproductive Outcomes Among Adolescents in Developing Countries*. Geneva: World Health Organization.

WHO. 2012. "Adolescent pregnancy. ." *Fact sheet No. 364*.
<http://www.who.int/mediacentre/factsheets/fs364/en/>. Accessed on 04.04. 2016.
World Health Organization.

Yavuz, S. 2010. "Changes in Adolescent Childbearing in Morocco, Egypt and Turkey." DHS Working Papers No. 75. Calverton, Maryland, USA: ICF Macro.

Zabin, L. S. & K. Kiragu. 1998. "The Health Consequences of Adolescent Sexual and Fertility Behavior in sub-Saharan Africa." *Studies in Family Planning* 29(2): 210-232.

Figure 1: Percentage of women who are already mothers by age, Mozambique, 1997 - 2011

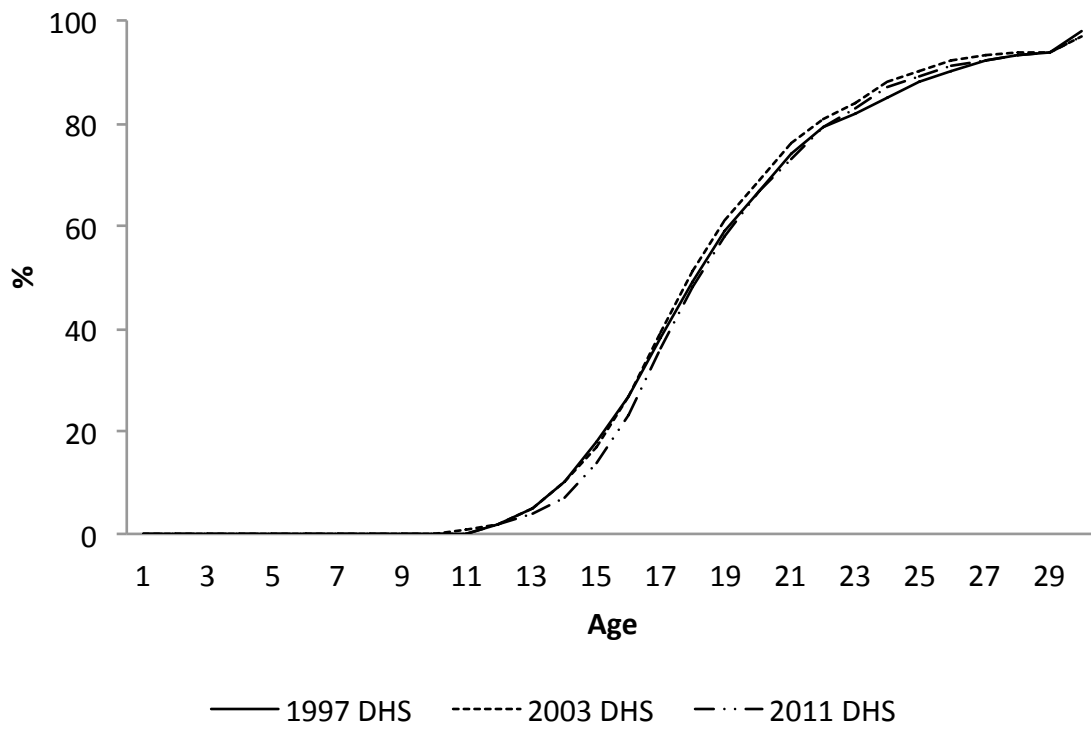


Figure 2: Adolescent fertility by place of residence, Mozambique, 1997-2011

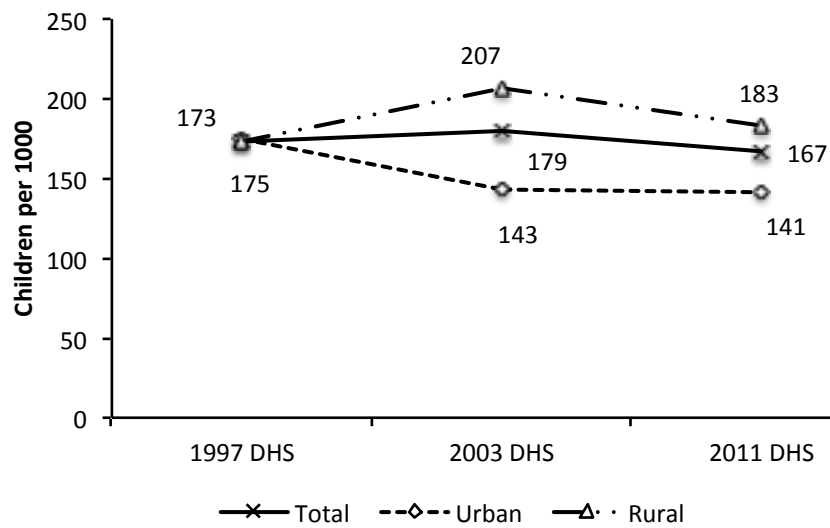


Table 1: Number of women included in the analysis by survey, Mozambique, 1997-2011

Survey	Women 15-19	Women 18-24
DHS 1997	1872	2507
DHS 2003	2644	3622
DHS 2011	3065	3563
Total	7581	9692

Source: DHSs 1997, 2003, 2011.

Table 2: Socioeconomic and reproductive behaviour characteristics of women aged 15-19 and 18-24 years, Mozambique, 1997-2011

	1997 DHS		2003 DHS		2011 DHS	
	15-19 years	18-24 years	15-19 years	18-24 years	15-19 years	18-24 years
<i>Years of schooling</i>						
No schooling	33.3	37.2	24.8	37.4	13.0	20.9
1-7 years	62.8	58.2	67.0	53.2	61.0	53.0
8 or more years	3.9	4.6	8.3	9.4	26.0	26.0
<i>Occupational position</i>						
No occupation	50.5	38.2	51.3	31.1	71.9	60.1
Low occupation jobs	44.1	55.7	41.5	58.8	23.4	29.2
High occupation jobs	5.4	6.1	7.2	10.1	4.7	10.7
<i>Place of residence</i>						
Urban	27.9	24.2	47.0	39.8	37.5	37.9
Rural	72.1	75.8	53.0	60.2	62.5	62.1
<i>Age at first sexual intercourse</i>						
Less than 15	31.1	21.3	32.3	22.9	32.4	26.5
15-16 years	31.7	27.4	45.8	38.6	50.4	40.3
17 years and over	37.3	51.3	21.9	38.5	17.2	33.2
<i>Age at first marriage</i>						
Less than 15	14.3	19.1	14.0	18.2	10.3	13.3
15-16 years	18.5	23.6	18.9	25.6	19.1	24.1
17 years and over	67.2	57.3	67.2	56.1	70.6	62.6
<i>Religion</i>						
Catholic	27.8	31.6	30.0	30.7	32.5	30.8
Protestant	7.9	7.2	29.9	28.3	24.5	24.1
Muslim	31.9	26.4	17.2	17.2	15.5	17.7
Zionist	13.2	16.6	8.1	9.4	16.2	15.6
Other religion			0.2	0.4	2.4	2.9
No religion	19.2	18.2	14.6	14.1	8.9	9.0
<i>Household Wealth Index</i>						
Poor	na	na	30.4	38.4	34.6	34.7
Middle	na	na	15.9	18.1	19.0	18.3
Rich	na	na	53.7	43.5	46.4	47.0
<i>Contraceptive experience*</i>						
Never used	92.9	88.2	56.3	46.5	79.2	71.2
Ever used contraception	7.1	11.8	43.7	53.5	20.9	28.8
<i>Media exposure</i>						
Not exposed to media	57.6	64.3	12.6	15.7	24.5	24.7
Exposed to media	42.4	35.7	87.4	84.3	75.5	75.3
<i>Pregnant/mother</i>						
No	60.0	na	59.0	na	62.5	Na
Yes	40.0	na	41.0	na	37.5	na
<i>Had first birth before 18?</i>						
No	na	59.0	Na	58.1	Na	60.8
Yes	na	41.0	na	41.9	na	39.2
No. of Cases	1,872	2,507	2,644	3,622	3,065	3,563

Note: na= not applicable; *% among ever sexually active women. Source: MDHS 1997, 2003, 2011.

Table 3: Multilevel logistic regression results assessing effects of individual- and community-level factors on odds of being a mother or a pregnant among adolescent women aged 15-19 years in Mozambique, 1997-2011 DHS

	1997 DHS Model I	2003 DHS Model II	2011 DHS Model III	Pooled Model IV	
Individual level variables					
DHS year					
1997 DHS				1.000	
2003 DHS				1.184	
2011 DHS				1.495	**
<i>Age</i>	1.857 ***	2.135 ***	2.314 ***	2.073	***
<i>Years of schooling</i>					
No education	1.000	1.000	1.000	1.000	
1-7 years	0.962	0.890	1.189	0.924	
8 or more years	0.675	0.278 ***	0.867	0.519	***
<i>Occupational position</i>					
No occupation	1.000	1.000	1.000	1.000	
Low occupation job	1.290	1.202	0.976	1.114	
High occupation job	1.160	1.523 *	1.684 *	1.410	**
<i>Place of residence</i>					
Urban	1.000	1.000	1.000	1.000	
Rural	1.185	0.882	0.994	1.143	
<i>Age at first sexual intercourse</i>					
Less than 15	1.000	1.000	1.000	1.000	
15-16 years	0.746	0.836	0.463 ***	0.668	***
17 years and over	0.604 **	0.487 ***	0.228 ***	0.440	***
<i>Age at first marriage</i>					
Less than 15	1.000	1.000	1.000	1.000	
15-16 years	0.542 **	0.383 ***	0.859	0.569	***
17 years and over	0.143 ***	0.068 ***	0.190 ***	0.121	***
<i>Religion</i>					
Catholic	1.000	1.000	1.000	1.000	
Protestant	1.457	1.028	1.260	1.193	
Muslim	1.249	0.755	1.128	1.108	
Zionist	1.078	0.983	1.218	1.126	
Other religion		4.403	1.704	1.391	
No religion	1.390	1.767 **	1.465	1.496	***
<i>Household Wealth Index</i>					
Poor		1.000	1.000		
Middle		0.795	1.658		**
Rich		0.667	0.967		
<i>Contraceptive experience</i>					
Never used contraception	1.000	1.000	1.0000	1.000	
Ever used contraception	0.841	1.264	0.9068	1.004	
<i>Media exposure</i>					
Not exposed to media	1.000	1.000	1.000	1.000	
Exposed to media	0.939	0.653	0.921	0.863	
Community lever variables					
% Ever used any contraception	0.4748	0.756	0.9478	0.623	*
% Poor households	na	0.928	1.2009	na	
% Exposed to media	3.4396 *	0.470	0.7469	2.292	**
% Women in high occupational jobs	1.6770	1.260	1.7650	1.645	
Average years of women education	0.9137	0.959	0.9600	0.944	
Constant	0.00007 ***	0.00005 ***	0.000003 ***	0.00002 ***	***
Random intercept (st. errors)	0.103 (0.466)	0.495 (0.13)	0.425 (0.147)	0.268 (0.080)	
Number of cases	1,872	2,644	3,065	7,581	

Note: *= $p < 0.05$; **= $p < 0.01$; ***= $p < 0.001$; na=not applicable. Source: MDHS 1997, 2003 and 2011.

Table 4: Multilevel logistic regression results assessing effects of individual- and community-level factors on the odds of having had a birth before age 18 among women aged 18-24 years in Mozambique, 1997-2011 DHS

	1997 DHS Model I	2003 DHS Model II	2011 DHS Model III	Pooled Model IV
Individual level variables				
<i>DHS year</i>				
1997 DHS				1.000
2003 DHS				0.844
2011 DHS				0.697 ***
<i>Age</i>	0.960	0.969	0.995	0.988
<i>Years of schooling</i>				
No education	1.000	1.000	1.000	1.000
1-7 years	1.135	1.087	1.015	1.055
8 or more years	0.517 *	0.368 ***	0.592 **	0.590 ***
<i>Occupational position</i>				
No occupation	1.000	1.000	1.000	1.000
Low occupation job	1.423	1.104	1.005	1.137
High occupation job	0.947	1.453 *	1.176	1.277 **
<i>Place of residence</i>				
Urban	1.000	1.000	1.000	1.000
Rural	0.744	0.758	1.153	0.814 *
<i>Age at first sexual intercourse</i>				
Less than 15	1.000	1.000	1.000	1.000
15-16 years	0.745	0.669 **	0.562 ***	0.648 ***
17 years and over	0.303 ***	0.292 ***	0.085 ***	0.213 ***
<i>Age at first marriage</i>				
Less than 15	1.000	1.000	1.000	1.000
15-16 years	0.402 ***	0.366 ***	0.390 ***	0.356 ***
17 years and over	0.042 ***	0.043 ***	0.070 ***	0.046 ***
<i>Religion</i>				
Catholic	1.000	1.000	1.000	1.000
Protestant	1.086	1.041	1.603 ***	1.256 **
Muslim	1.161	1.087	1.243	1.123
Zionist	1.199	0.814	1.698 ***	1.256 **
Other religion	na	0.696	1.414	1.202
No religion	1.259	1.311	1.545 **	1.362 **
<i>Household Wealth Index</i>				
Poor		1.000	1.000	
Middle		0.948	1.243	
Rich		0.961	1.047	
<i>Contraceptive experience</i>				
Never used contraception	1.000	1.000	1.000	1.000
Ever used contraception	1.688	2.504 ***	1.856 ***	1.897 ***
<i>Media exposure</i>				
Not exposed to media	1.000	1.000	1.000	1.000
Exposed to media	0.973	0.675 **	0.881	0.855 *
Community lever variables				
% Ever used any contraception	1.667	0.380 ***	0.549	0.686
% Living in poor households	na	0.777	0.993	
% Exposed to media	1.806	1.869	0.919	1.025
% Women in high occupational jobs	0.968	0.863	1.009	0.939
Average years of women education	0.890	0.960	1.089 *	1.003
Constant	17.093 ***	36.144 ***	6.111 **	14.796 ***
Random intercept (st. errors)	0.299 (0.141)	0.203 (0.166)	0.333 (0.124)	0.274 (0.058)
Number of cases	2,507	3,622	3,563	9,692

Note: * = p < 0.05; ** = p < 0.01; *** = p < 0.001; na = not applicable. Source: MDHS 1997, 2003 and 2011.

