

**Just a Little Bit Later:**  
**Examining the Effects of Conditional Cash Transfers on Age at Marriage**  
**Among Poor Girls in Mexico**

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Paper submitted for the Annual Meeting of the Population Association of America

Detroit, April 30 – May 2, 2009

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## **Background**

Adolescent girls' transition to adulthood is a conflux of competing strategic life choices – including decisions regarding continuation of schooling, economic activity, marriage and childbearing. In rural Mexico, widespread poverty makes these choices even more important; early marriage and childbearing can contribute to the intergenerational transmission of poverty (Greene and Merrick 2005, Merrick 2008) and poverty and a lack of opportunity for women may encourage them to form new families at an early age. At the same time, early marriage and childbearing can make it harder for families to leave poverty, because young wives have often not completed secondary education and have limited earning potential.

While adolescent sexual activity and childbearing has been widely studied in Mexico (see for example, Sanchez 2003, Wulf and Singh 1991, Singh and Samara 1996), less attention has been paid to adolescent marriage and union formation. This trend in the literature clearly reflects realities for Mexican adolescent girls today; in 2002, roughly 55% of youth aged 10-24 were sexually experienced compared to 7% of girls and 3% of boys aged 10-19 who were married (Sanchez 2003). Furthermore, the age at first marriage in Mexico has increased slightly in the last 25 years and union formation has tended toward cohabitation rather than marriage (Vernon and Dura 2004, Tuiran et al 2004, Wulf and Singh 1991, Singh and Samara 1996).

Despite these encouraging trends towards later union formation, adolescent marriage in Mexico is not yet a non-issue, particularly in rural and indigenous areas. In 2003, roughly five million adolescents aged 10-19 were married and 31% of youth aged 10-24 were married or cohabiting (Sanchez 2003). Of those who are married or cohabiting, 53% entered union between ages 15 and 19 (Sanchez 2003). First union formation before age 20 is much higher in rural areas compared to urban locales (Wulf and Singh 1991, Billings et al 2004); using 1987 DHS data, Wulf and Singh (1991) found that 62.2% of women aged 20-24 in rural areas entered their first union before age 20, compared to 38% aged 20-24 of women in non-rural areas. Estimates from 2003 suggests that one in five rural girls aged 10-19 are married or cohabiting (Sanchez 2003), whereas 85% of urban females aged 15-19 have never been married or lived with a partner (Vernon and Dura 2004). Moreover, indigenous girls and young women seem to face the greatest

disadvantage. Although data on marriage is scarce, data on access to contraception suggest significant need; in 1997, over one quarter (25.8%) of married indigenous women of reproductive age had an unmet need for contraception, compared with 22.2% of all rural women and roughly 10% of all Mexican women (rural, urban and indigenous) (Tuiran et al 2004).

For those girls and young women who do marry as adolescents, union formation can significantly curtail opportunities. The legal age of marriage in the Federal District (Mexico City) is 18, and ranges from 14-16 in other states (United Nations Statistics Division 2006, Center for Reproductive Law and Policy 1997), and marriage before these ages poses threats to girls' education, economic well-being and health. Although data on the consequences of early marriage in rural Mexico are limited, research from other contexts suggests that adolescent marriage may precede or coincide with termination of formal schooling, reduce employment prospects, and increase the risk of poverty (Mensch et al 1998; Singh and Samara 1996; UNFPA 2005; Zabin and Kiragu 1998; Mathur et al 2003). Adolescent childbearing may be another negative outcome occurring concurrent with or as a result of marriage; research from Mexico suggests that early sexual activity often occurs within marriage or cohabitation. In one evaluation of a school-based sexual education program, 43% of sexually active students were married or cohabiting (Population Council 2003), and other data suggests the majority of sexual activity is initiated with a boyfriend or spouse (Sanchez 2003). Pregnancy and childbearing before age 17 can pose serious health risks, including increased risk for maternal morbidity and mortality (Kurz 1997; Senderowitz 1995).

Although less common than adolescent sexual activity, adolescent marriage remains a significant challenge for rural and indigenous Mexican girls as they transition into full and productive adulthoods. Identifying policy and programmatic approaches to delay the age at which girls marry is thus imperative for increasing girls' life options and reducing the intergenerational transfer of poverty.

*Strategies to delay marriage in Mexico*

Rural girls face a disproportionate risk of marrying during adolescence. This increased likelihood of marriage may result through several mechanisms. First, children living in rural areas are more likely to play productive economic roles in their households, and in the areas targeted by *PROGRESA*, children's earnings was estimated at 5-9% of household income for extremely poor families (Adato et al 2000). When these productive economic roles compete with education, rural girls complete fewer grades and drop out earlier than their urban counterparts (Wulf and Singh 1991). For example, in 2000, school enrollment among girls aged 15-19 living in Michoacán was only 44.3%, compared to 67.0% among girls aged 15-19 living in Mexico City (INEGI 2007). In rural Mexico, as in many other contexts, lower educational attainment increases girls' risk of early marriage (Merrick 2008, Tuiran et al 2004, Singh and Samara 1996). Secondly, economic well-being is associated with delayed marriage, and many rural families and girls face greater economic hardships than families living in urban areas (Tuiran et al 2004). Thirdly, the timing of parental childbearing can significantly influence girls' marital ages. A recent study of girls living in the *PROGRESA* intervention and control areas found that daughters of mothers who first gave birth before age 18 were more likely to themselves marry before age 18 than daughters of mothers who bore children later (Merrick 2008). Despite these significant barriers facing rural girls, many adolescents feel some degree of control over strategic life decisions, including when to marry (Vernon and Dura 2004), thus it is important to identify solutions to the structural constraints like economic hardship that limit girls' ability to act on their aspirations.

Reproductive health programs that teach and support adolescent girls and women in delaying sexual debut, negotiating the terms of their sexual relationships, and offering them access to contraception and other reproductive health services can delay age at pregnancy or first birth, although evaluation results are somewhat mixed (Lloyd et al 2005; Speizer et al 2000). By delaying pregnancy, such reproductive health programs could then reduce girls' need to marry or enter into a union as a result of pregnancy or childbirth.

School-based reproductive health programs in Mexico have been successful in improving youth knowledge and attitudes about reproductive health, but seem to have little effect on improving behaviors (see for example, McCauley et al 2004, Population Council 2003, Vernon and Dura

2004). For example, MEXFAM's Young People's Program improved already high knowledge and positive attitudes about reproductive health, awareness of contraception and attitudes that adolescents should have access to and be treated respectfully when accessing contraception in pharmacies (Vernon and Dura 2004). However, the program led to few changes in behavior (Vernon and Dura 2004). In addition, such programs are often highly politicized and fraught with controversy (Center for Reproductive Law and Policy 1997). Although Mexico's strong and progressive civil society movement has advanced reproductive rights and access to information and services (Greene, Rasekh and Amen 2002), the Catholic Church exerts considerable social influence within the country and poses significant barriers to adolescent sexual and reproductive health programs, including sex education and service provision.

In contrast with reproductive health programs, conditional cash transfer (CCT) programs enjoy significant political traction because their structure frees them from some of the political challenges that reproductive health programs often face. Two features of conditional cash transfer programs stand out as attractive contrasts with standard reproductive health programs. First, the cash can serve the immediate needs of the very poor, while the conditions required of recipients promote longer-term investments in their human capital (e.g., Fernald et al 2008). Second, and this is especially relevant to any effort to delay marriage and childbearing, the focus on education and the use of health services for mothers sidesteps the politics of reproductive health while bringing about multi-faceted benefits to participants.

Mexico's *PROGRESA* program is one such CCT program. The program was first implemented from 1998-2000, and was later scaled up under the name *PROGRESA*. *PROGRESA* aimed to reduce poverty in rural areas, as well as to improve child health and education (Adato et al 2000), and it has been extensively evaluated (see for example, Adato et al 2000; Coady 2003; Rivera et al 2004; Behrman et al 2005; Skoufias 2005; Merrick and Greene 2007; Stecklov et al 2007; Fernald et al 2008; Leroy et al 2008; Merrick 2008). The program specifically sought to reduce the intergenerational transmission of poverty using cash transfers to mothers who kept their children in school and made use of health and nutritional services.

Under *PROGRESA*, eligible households – that is, the poorest households in selected intervention localities – received cash transfers, usually delivered to mothers, provided that they met certain conditions related to their children’s education and their own and their children’s health (Adato et al 2000). Within the education component, which this paper focuses on, the program prioritized “continuous and regular attendance,” especially for girls (Adato et al 2000), by increasing the grant size as children progressed through grade levels and by providing larger grants for girls than boys when students were in secondary school (Adato et al 2000). Families could receive cash transfers, which amounted to roughly 30% of household income, for any child between ages 7-18 (Adato et al 2000). Under the original *PROGRESA* program, families were eligible to receive cash grants if children were enrolled in school and achieved 85% attendance, while *PROGRESA* built on this and linked cash benefits to academic performance by, for example, awarding bonuses for completing a given grade (Adato et al 2000, Skoufias 2005).

*PROGRESA* may work through three mechanisms to delay girls’ marriage: increasing girls’ educational attainment, improving household economic status, and changing household and community norms about girls. First, because *PROGRESA* is conditional upon school attendance, the cash transfer increases the value of girls’ time spent in school relative to time spent in other activities like housework or chores (the substitution effect). The increased relative value of girls’ education resulting from the transfers should lead to increased investments in girls’ schooling, which is expected to delay marriage and childbearing. At the community level, the improvements to community education and health infrastructure offered under *PROGRESA* (i.e., improvements in education quality, greater access to schools and health services) may offer greater opportunities to pursue secondary and higher education. Secondly, by increasing household income through a cash transfer, *PROGRESA* should also lead to increases in investment in all children’s schooling (if education is a normal good) (Fernald et al 2008; Stecklov et al 2007). Thirdly, the explicit emphasis of *PROGRESA* on the importance of girls’ education may also alter personal and social attitudes about the proper role of women (e.g., Coady 2003), fostering norms that encourage investment in girls’ education and educational equality between boys and girls. *PROGRESA* was designed not only to encourage girls’ educational achievement, but also to “internalise education externalities that accrue to other families after the marriage of females” (Adato et al 2000).

Previous research on the effects of *PROGRESA* suggests that it may contribute to delaying rural girls' marriage, although results have been mixed. A recent study suggests that *PROGRESA* does not contribute to delaying girls' marriage, as the proportion of girls married between 1997 and 2003 is not significantly affected by the program (Behrman et al 2005). Yet unpublished preliminary research seems to suggest that in urban areas, living in an *PROGRESA* intervention area significantly delayed the age at marriage among young adolescent girls (Gulemetova-Swan, 2009). Although direct evidence on the contribution of *PROGRESA* to delaying marriage is limited, the program has significantly increased the enrollment of girls at the primary and secondary levels (see for example Skoufias 2005, Behrman et al 2009), which can lead to later marriage. Furthermore, earlier research also showed how *PROGRESA* ameliorated the negative impacts of early childbearing of the mother on her daughter's education (Merrick and Greene 2007). Between 1997 and 2000 the cash transfers nearly eliminated the schooling gap observed for daughters of early-childbearing mothers (compared to both boys and to girls whose mothers had given birth to them later) observed in the baseline survey of households in rural Mexican municipalities where *PROGRESA* was implemented (Merrick and Greene 2007)

**Comment [JM1]:** We plan to include a longer and more comprehensive discussion of previous research on *PROGRESA* in the next version of the paper.

The current paper builds on this earlier work, as well as research to examine trends in marriage over time in *PROGRESA* localities (Merrick 2008). We investigate the effect of *PROGRESA* transfers on age at marriage for girls exposed to the program, examining the effects of living in an intervention area without necessarily receiving cash benefits, of living in a household that receives cash transfers, and of living in a household that receives transfers because the daughter is in school. We hypothesize that the investments in community education and health infrastructure that characterize *PROGRESA* intervention areas will not be sufficient to delay the age at which girls marry. However, we expect that girls whose families benefit from any cash transfer will marry later than girls whose families do not benefit.

## **Methodology**

### *Data*

This paper uses data from the *PROGRESA* program evaluation (Instituto Nacional de Salud Pública 2005). The evaluation randomized implementation of the CCT program over poor, rural communities in Mexico. Eligible households in intervention localities could receive the *PROGRESA* cash transfer in starting April 1998 while households in control localities were not eligible to receive cash transfers until December 1999. Evaluation data were collected from a sample of 506 communities in seven Mexican states (Guerrero, Hidalgo, Michoacán, Puebla, Querétaro, San Luis Potosí and Veracruz). Of these 506 communities, 320 were randomly assigned to receive the intervention and 186 were randomly assigned to the control group. Data were collected from all households in the 506 communities each year from 1997-2000 on household incomes, migration, education, and marriage. In 2003, similar data were collected from all households within the original intervention and control localities, as well as from all households within a third group of communities (n=152) not exposed to the program. This group of communities was not part of the original randomization effort. Households within the 2003 external control group were also asked retrospective questions about their household incomes, education, and marriage in 1997 to provide comparative information to the original baseline sample. Thus, we have continuous survey data from 1997-2003 on households that entered the pilot program in 1998 and on households that entered the program in 2000, and data from two time periods on households that did not enter the program until after 2003. Data were also collected in all *PROGRESA* in intervention, control and external control localities about community characteristics, including prices, access to schools and health services, perceptions of social inequalities, and social norms. For further description of the program and study design, see Instituto Nacional de Salud Pública 2005.

We use data from the 1997, November 2000 and 2003 waves of the *PROGRESA* evaluation. We use information from 1997 to construct our control variables, information from 2000 to construct *PROGRESA* exposure measures, and information from 2003 to construct the dependent variables, thus using the quasi-experimental nature of the data to account for endogeneity. One exception to this is the community-level control variables; community-level data were obtained from the survey conducted on each locality in 2003. Household surveys were interviewer administered, and one member of the household provided data on themselves and all other members of the



household. The locality surveys were also interviewer administered, and one leader from each community completed the survey. Data from each of these waves were merged to create an individual level dataset for analysis. When merging the community-level data to the individual data, we assigned the community information to all individuals within that community.

### *Sample*

We include only households in the 2003 wave whose heads had a daughter, adopted daughter or step-daughter aged 15-20 in 2003 and which had information available for 1997, whether collected at the time or retrospectively. We limit our analyses to these households, as we are interested in parental and household influences on girls' outcomes; thus, we include only girls for whom we have information about their parents. Limiting the analyses to households for which information is available in both 1997 and 2003 allows us to construct our control variables from the 1997 data, thus avoiding potential endogeneity of program effects.

Figure 1 summarizes our sample selection strategy. In 2003, 11,634 households had one or multiple girls aged 15-20 reported on the household roster (n=16,044 girls). First, we excluded individuals who belonged to households that were not present for the 1997 or 2000 data collection rounds (n=2,784 households and n=3,493 girls). Next, we excluded individuals whose reported sex differed between 1997 and 2003 (n=346 individuals excluded). We limited our analyses to girls aged 15-20 who were daughters, adopted daughters, or step daughters; we excluded 1,682 girls who had a different relationship to the head of household. Then, we dropped individuals who belonged to households that could not be matched with confidence across the 1997, 2000 and 2003 surveys (n=878 girls from n=668 households).<sup>1</sup> Further, we excluded girls who were already married in 2000 (n=36 girls), and girls who were either not considered a part of the household in 2003 (n=24 girls), had died (n=23 girls) or were missing information on their relationship to the household (n=73 girls). It is worth noting that some of these girls may no longer be considered part of the household because they got married.

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<sup>1</sup> We considered households in which more than one-third of the reported household sexes and ages mismatched between 1997, 2000 and 2003 as households that could not be matched with confidence across survey waves. Ages were considered to mismatch if the reported age differential between 1997 and 2003 was less than four years and greater than eight years.

Finally, the *PROGRESA* questionnaire asked respondents about all household members' ages at the time of interview and their year of birth. We used both reported year of birth (between 1983 and 1988) and reported age (between 15 and 20) to determine girls' inclusion in the sample. Although this may exclude some girls who fall within our target age range (n=651 girls excluded whose reported age and year of birth varied), we feel it most accurately captures girls who are at risk of marriage and eligible to receive a *Progresa* educational transfer in 2000, when they were aged 12-17. The final sample for analysis is 8,798 girls from 6,622 households.

### *Measures*

The data enable us to examine whether living within an intervention locality or receiving an educational transfer from *PROGRESA* has an impact on the timing of marriage for girls. A list of the key variables included in the analysis appears in Table 1. Our primary outcomes of interest are girls' marriage or cohabitation at or before ages 15, 16, 17, and 18. Consensual unions are common in rural Mexico, so we consider cohabitation as a marriage outcome. We use four separate binary outcomes of age of marriage or cohabitation: whether girls aged 15-17 were married at or before age 15; whether girls aged 16-18 were married at or before age 16; whether girls aged 17-19 were married at or before age 17; and whether girls aged 18-20 were married at or before age 18. We restrict the age groups for each of our dependent variables to ensure that girls included were old enough to be married by the cut off age, yet young enough that had not already reached the cut off age in 2000. Marriage or cohabitation by ages 15 and 16 are very early, whereas marriage by ages 17 or 18 are more normative in the Mexican context.

Exposure to *PROGRESA* is measured in three ways. The first is a three-category measure of where the household was located: in the original intervention sample, in the original control sample, or in the 2003 external control group. The second measure captures household receipt of *PROGRESA* transfers in 2000; the girl is considered a 'yes' response if her household was currently (as measured in 2000) receiving a monetary transfer from any aspect of the *PROGRESA* program. Households could have received educational transfers because at least one child was in school, for childhood immunizations, or because mothers attended health meetings. Households

in the 2003 external control group do not have data available for 2000; however, because *PROGRESA* had not yet expanded to their localities all households within this group are considered not exposed to the program. Thirdly, we measure girls' benefits from *PROGRESA* in 2000; the girl is considered to benefit if her household was currently receiving any monetary transfer because she was attending school. Including different measures of *PROGRESA* exposure allows us to investigate whether cash transfers conditional on girls' behaviors are more influential than transfers conditional on other household behavior in delaying girls' marriage. Analyzing the effect of the household locality (the intention to treat analysis) allows us to understand whether potential benefits felt at the household level spill over into communities, including households that do not receive any benefits directly.

Our independent variables are specific to girls, parents, households, and communities. All girl, parent and household control variables except girls' ages were measured in 1997 to avoid endogeneity. At the girl level, we include a categorical measure of their school enrollment in 1997 (enrolled, not enrolled, or not reported) and a continuous measure of girls' age in 2003.

For girls' parents, we include two categorical measures of educational attainment in 1997, one for fathers and one for mothers (none, some or complete primary, some or complete secondary, post secondary, or not reported); one measure of work within the last week for fathers and one for mothers in 1997 (did not work, worked, has a job but did not work, worked without pay, or not reported).

At the household level, we included a categorical measure of parental presence in the household in 1997 (no parents, father only, mother only, both, and not reported). We also included a continuous measure of household socioeconomic status in 1997. Household socioeconomic status is measured with an index of amenities in the household, including ownership of a range of consumer durables (e.g., a blender, gas stove, refrigerator, radio, television, and so on), the type of toilet facilities and water supply, and access to electricity. This index was created using the "alpha" command in Stata 9.0, which computes the inter-item correlations for all pairs of variables and produces a Cronbach's alpha statistic to evaluate the scale formed from these variables. The Cronbach's alpha value for this index is 0.755 and the range is 0.723 to 0.759. We

also included a categorical measure of household poverty status used to determine eligibility for *Progresa*; households were classified as poor, almost poor, and not poor.

Finally, we used data from the locality survey in 2003 to construct control variables measuring various community characteristics. We included dichotomous measures of whether the community had a secondary school,<sup>2</sup> whether the community had family planning services available, whether agriculture was a primary productive activity within the community, and four categorical measures of perceived inequality (in education, land ownership, socioeconomic status, and between genders). We also used a continuous measure of the official minimum wage for day labor.

Two limitations in our measures should be noted. First, although we examined other variables measured in 1997 that may have affected girls' school enrollment and attendance and therefore their age at marriage (average travel time to school, their fathers' work status in the last week, the number of days their father worked over the last week, the number of temporary migrants from the household, the number of temporary migrants from the household that sent money home), we excluded these from our analyses presented in this paper. Besides fathers' work status in the last week, none of these measures were available for individuals in the 2003 control group. Further, few differences existed between the intervention 1998 and intervention 2000 groups. The second major limitation is collinearity, as many of our control measures are closely related to each other. We excluded girls' school enrollment in 1997 from our models, as nearly all girls were enrolled thus the data lacks variation. Mothers' and fathers' education and work were correlated; we opted to use mothers' education as evidence suggests mothers' educational attainment has a greater effect on child outcomes than fathers (e.g., Klasen 2004) and fathers' work as little variation existed in mothers' work patterns. Parental presence in the household could not be included in our multivariate analyses, as it was collinear with parental education and work.

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<sup>2</sup> Having a primary school in the community was one of the eligibility criteria for *Progresa*.

### *Analytic procedures*

Although we include data collected at the household and community level, all analyses were conducted at the individual level. As such, some households had multiple daughters included in the analysis and communities with a larger number of target girls living within them make up a larger proportion of the tabulated data. To account for these levels of information, robust standard errors are calculated to account for clustering at the community level (n=183 clusters).

We use basic descriptive statistics to describe the study population and bivariate descriptive and inferential statistics to examine the sample by our four outcome variables (married or cohabiting at or before age 15, 16, 17 or 18). We use logistic regression to analyze our four separate binary outcomes. In total, we ran 12 models covering the combination of the four outcome variables and the three exposure measures. Although various pathways may be at work to delay marriage, this analysis provides an overall view of the effects of the conditional monetary transfer on the timing of girls' marriage.

Although we used all of the above variables in the descriptive analyses, we included only mothers' educational attainment, fathers' work characteristics, household socioeconomic status and poverty level, and community measures of resources (secondary school and family planning services available in the community) in the regression models because of multicollinearity. Multicollinearity was determined using the variance inflation factor (VIF) test, where measures loading with a VIF of greater than 10 were excluded.

The logistic regression equation used to capture this model is:

$$\text{logit}(m) = \log(m/(1-m)) = \beta_0 + \beta_1*(Progresa) + \beta_2*(mother\ edu) + \beta_3*(father\ work) + \beta_4*(SES) + \beta_5*(poverty) + \beta_6*(comm.\ school) + \beta_7*(comm.\ FP)$$

where  $m$  represents the probability of an affirmative marriage outcome, *Progresa* represents the measures of exposure to *Progresa*; *mother edu* represents mothers' educational attainment; *father work* represents fathers' position; *SES* represents household socioeconomic status; *poverty*

represents the predetermined measure of household poverty status; *comm. school* represents whether the community has a secondary school; and *comm. FP* represents whether the community has access to family planning services.

## **Descriptive statistics**

Table 2 describes girls' early marriage in 2003, exposure to *Progresa* benefits in 2000 and individual characteristics in 1997; their parents' characteristics in 1997; and features of the household in 1997. A small but noteworthy proportion of girls married very early (at or before age 15), and the proportions married at each successive age increased steadily. While only seven percent of girls aged 15-17 were married at or before age 15, over one in ten (12%) girls aged 16-18 was married by 16, nearly one in five (19%) girls aged 17-19 was married by 17, and over one in four (28%) girls aged 18-20 was married by 18.

Many girls included in the analysis were exposed to the *PROGRESA* program in 2000 in at least some way. Nearly half (47%) of girls lived in an original intervention community, almost one-third (31%) lived in a community that was eligible to begin receiving benefits in 2000, and just over one in five (22%) girls lived in the control communities. More than half of all girls lived in a household in which at least one member received *PROGRESA* benefits in 2000 (61%), although fewer than one in four girls lived in households that received *PROGRESA* transfers because they were in school (24%). See Table 2.

Our sample contains roughly equal proportions of girls at each age between 15 and 20, and the vast majority of girls were enrolled in school in 1997 (93%). Most mothers had very low levels of education; almost two in five (37%) had no education and nearly 60% had only some or complete primary education. In terms of employment, most fathers were involved in agricultural work (60%), although sizable minorities were self-employed, worked as a supervisor or an employee (12%), or engaged in non-agricultural work (9%).

In the vast majority of households the original intervention and original control groups, both parents lived in the household (85%). See Table 2. Migration was not common, but one in five

girls living the original intervention or original control areas had at least one temporary migrant from their household. Most households were poor, as would be expected given that *PROGRESA* was a poverty reduction program. According to the *Progresa* poverty classification, nearly nine in 10 (85%) of girls lived in households characterized as ‘poor.’

We also describe the communities girls live in, despite excluding most of these variables from the multivariate analyses (Table 3). Sizeable minorities of girls lived within communities that had a secondary school (35%) or family planning services (42%). Agriculture was the primary productive activity the vast majority of communities where girls lived (92%). Finally, from one-fifth to one-third of girls lived in communities in which community leaders perceived high levels of inequality in terms of educational attainment, land ownership, socioeconomic status, and gender norms.

### **Analysis and results**

Tables 4 and 5 present the results of univariate logistic regression models examining the unadjusted effects of *PROGRESA* exposure in 2000 on girls’ likelihood of being married at or before ages 15, 16, 17 and 18. Models 1, 4, 7 and 10 show the unadjusted odds ratios for the type of locality on each of the four outcomes; girls living in an original intervention locality have roughly equal odds of marriage at any age compared to girls living in original control areas, while girls living in the 2003 external control group have half the odds of marrying at these ages. Similarly, girls who live in households in which at least one person received *PROGRESA* transfers in 2000 have significantly higher odds of marriage by any age compared to girls who live in households that did not receive *PROGRESA* transfers (see models 2, 5, 8 and 11). Finally, models 3, 6, 9 and 12 show the unadjusted effects of girls living in a household that received *PROGRESA* transfers because they themselves were in school in 2000 on early marriage outcomes. While the other two measures of exposure appeared to increase the likelihood that girls would marry, girls who lived in households that received transfers because they themselves were in school had significantly lower odds of early marriage than girls who did not benefit. All results are strongly significant, except for the effect of the girl living in a household that benefits because she is in school on marriage by 18 (model 12).

These patterns are visible in our multivariate analyses as well, although the magnitude of effect decreases after controlling for parent-, household- and community-characteristics. Table 6 provides odds ratios and regression results of the analysis of the independent effects of *PROGRESA* exposure on whether girls aged 15-17 in 2003 married at or before age 15. Model 13 measures the independent effect of *PROGRESA* locality (original intervention, original control, and 2003 control), model 14 measures the independent effects of at least one household member receiving any *PROGRESA* transfer within the last six months, and model 15 measures the independent effect of girls living in households that received an *PROGRESA* transfer because they themselves were in school on girls' marriage by 15 in 2003. Girls aged 15-17 who live in original intervention communities have equal odds of marriage by 15 as girls living in original control communities, while girls in the 2003 external control group have significantly lower odds of early marriage (AOR=0.5,  $p<0.01$ ). Similarly, when examining the independent effect of living in a household that received *PROGRESA* benefits, girls who live in households that received benefits have higher odds of marrying at or before age 15 than girls in households that did not receive benefits (AOR=1.5,  $p<0.05$ ). Yet when girls aged 15-17 live in households that receive transfers because they themselves attend school, they have far smaller odds of marriage by age 15 than girls whose households do not receive benefits because of their school enrollment (AOR=0.6,  $p<0.05$ ).

Similar results are observed when examining marriage at or before age 16 for girls aged 16-18 (Table 7), marriage at or before age 17 for girls aged 17-19 (Table 8), and marriage at or before age 18 for girls aged 18-20 (Table 9). Models 16, 19 and 22 shows that girls living in communities which were eligible for *Progresa* benefits in 1998 had equal odds of marriage by 16, marriage by 17 and marriage by 18 as girls living in communities eligible for the program in 2000; again, girls in the external control areas had significantly lower odds of marriage by 16, 17 and 18 than those in original intervention and control areas (AOR=0.5,  $p<0.01$  for marriage at 16 and 17, AOR=0.06,  $p<0.01$  for marriage at 18). As with marriage by 15, when girls live in households that receive *PROGRESA* transfers, they have higher odds of being married by 16 (AOR=1.7,  $p<0.01$ ), by 17 (AOR=1.6,  $p<0.01$ ) and by 18 (AOR=1.5,  $p<0.01$ ) than girls who live in households that don't receive the transfer (models 17, 20 and 23). However, when girls'



households receive *PROGRESA* transfers because they themselves are in school (models 18, 21 and 24), they have significantly lower odds of being married by 16 (AOR=0.5,  $p<0.01$ ), by 17 (AOR=0.6,  $p<0.01$ ), and by 18 (AOR=0.8,  $p<0.10$ ). At each marital age, girls who live in households that are eligible for or benefit from *PROGRESA* appear to be at greater risk of marriage than girls who live in ineligible households or localities, even after controlling for parental, household and community characteristics. The exception is when girls' households benefit because they themselves are in school; *PROGRESA*' driven-school enrollment significantly lowers girls' odds of marriage at each age, except age 18, when marriage is much more common.

In each model we analyzed, the parent and household control variables had the expected effects. At each marital age, daughters of mothers with at least some primary education had significantly lower odds of being married than girls' whose mothers had no education. In most models, daughters of fathers who worked had slightly lower odds of marriage at an early age than girls whose fathers did not work, although fathers' employment only significantly predicted girls' marriage when looking at marriage by age 16 (models 4-6). Girls who lived in wealthier households had significantly lower odds of being married by any age. As household wealth increased, girls had between 0.5 and 0.9 times of the odds of marriage. Girls who lived in almost poor or non-poor households were much less likely to be married at age 17 or 18 than girls living in poor households, although this effect was not observed for very early marriage at age 15 or 16.

Two counterintuitive findings emerged at the community level. First, presence of a secondary school within the community did not exert an independent effect on girls' experience of marriage, except when looking at marriage by age 15, which was even then only a weakly significant effect. Second, in all models regressing on girls' marriage by age 15 and marriage by age 16, girls who lived in communities where family planning services were available had slightly *higher* odds of experiencing marriage than girls who lived in communities without family planning services available. See models 13-20.

## **Discussion**

When examining the effects on girls of household exposure to *PROGRESA* benefits, it appears that girls who live in households that received any *PROGRESA* transfers or in households located in an *PROGRESA* intervention area are more likely to marry early than girls who live in households that have not been exposed to *PROGRESA*. Although this may suggest that *PROGRESA* has no effect on delaying marriage, or worse, actually encourages girls to marry early, communities and households targeted by the program may actually have a higher motivation for and tolerance of early marriage compared to non-targeted areas. Eligible households were the poorest in Mexico and eligible communities often had a high proportion of indigenous residents, where early marriage is more likely. Moreover, it may be that households that received *PROGRESA* benefits, but not because their daughters were in school, place less economic and social value on their girl children, and thus would be more likely to marry daughters early regardless of monetary supplements. The unexpected positive effects of exposure may then be attributed to the fact that the data on household exposure include some households that elected *not* to send their daughters to school. Moreover, our analyses demonstrate that *PROGRESA* can delay marriage. When girls themselves contribute to their household income because their school attendance earns their family an *PROGRESA* transfer, their odds of marrying and marrying very early decrease significantly.

Adolescent girls often cannot take full advantage of household goods, household interventions or poverty reduction interventions both because girls often have many competing time burdens when compared to boys or men (e.g., housework or fetching water) and girls may be undervalued by their families (for competing time burdens, see Zuckerman 2002; for undervaluing girls, see Victora et al 2003). Our findings demonstrate that if governments, programmers, and donors want to improve the status of adolescent girls, it is important to target interventions directly towards girls and incentivize girls' participation, even though girls themselves may not be responsible for money or other household goods. In the context of a household or family targeted program, the needs of adolescent girls must be specifically addressed in order to achieve the desired benefit(s).

Moreover, our analyses demonstrate that *PROGRESA*' community level investments in improving education quality, access to schools, and preventive health services like nutrition

education and primary health care, are not sufficient to change marriage behaviors within poor, rural communities in Mexico. The lack of positive spillover in delaying the age at marriage to households in intervention communities suggests that in its first five years, the *PROGRESA* program did not lead to community level changes concerning girls' education, marriage, or life trajectories. Rather, that fact that girls whose families received a stipend were attending school appears to underlie girls' later marriage. It is also possible that the additional income households possessed as a result of girls' school attendance constructed activities other than marriage (e.g., continued schooling or economic activity) as viable options for middle- and late-adolescence.

Our results also confirm the hypothesized effects of parental and household variables on girls' age at marriage. As mothers' education increased, girls were less likely to marry early than girls whose mothers had no education. These results confirm that maternal education is important in limiting the intergenerational transfer of poverty (e.g., Klasen 2002; Lagerlof 2003; Yamarik and Ghosh 2004; Greene and Merrick 2005). Surprisingly, fathers' work status had little effect on girls' early marriage. In contrast, household wealth had a strong and negative effect on girls' early marriage, as expected. Our results suggest that *PROGRESA* transfers can contribute to leveling the playing field for girls who live in poorer households.

Although our analyses do not allow us to draw conclusions about the effects of each element of the *PROGRESA* program, our results suggest that the family planning service availability (*PROGRESA* incentivized regular pre- and post-natal and family planning visits) made little difference in delaying marriage, and may have contributed to increasing early marriage. Exposure to the concept of fertility regulation and to conversations on the topic with educators and peers might have had an indirect effect on marriage norms. These results highlight the importance of providing family planning services within a package of other intervention components that directly or indirectly encourage behavior change around marriage and childbearing. Such multi-pronged programming may include educational benefits like those in the *PROGRESA* program, or community awareness raising, reproductive health education for youth and economic empowerment activities that give youth other options beyond early marriage (e.g., Kanesathasan et al 2008; Lloyd 2005).

### *Limitations*

The *PROGRESA* evaluation data are considered very high quality and successfully tracked households and individuals over the six-year data collection period. However, our findings are only representative of girls similar to those included in our study; namely, unmarried adolescent daughters, adopted daughters or step-daughters living in households that are eligible for *PROGRESA*. Further, some of our target girls may have left their households after 2000 to marry, in which case our results would overestimate the effects of *PROGRESA*.

Next, our analyses include data from only three waves of the *PROGRESA* evaluation. Although including exposure information from other survey waves would have created a more nuanced measure of receipt of *PROGRESA* benefits (for example, duration of receiving transfers), our analyses demonstrate that any *PROGRESA* benefits, as a result of girls' school attendance, contribute to delaying the age at which girls marry. Further research to investigate ideal amount and duration of benefits could provide additional information on the design of conditional cash transfer programs. Future research that controls for young mothers' age at first childbirth and the age at which older siblings left the household would add to the evidence.

### *Implications*

Early marriage can pose significant costs to girls, their families, and their communities in terms of girls' capabilities, education, and health, can contribute to the intergenerational transmission of poverty and can slow economic growth at the national level. Thus, policy and program responses to delay marriage among girls can have long-term benefits for girls themselves, their families, and their countries' development.

Early marriage reduces girls' opportunities to further their education and/or invest in a career, two experiences that can contribute to girls' empowerment (e.g., Malhotra and Schuler 2005; Schuler et al 1995; Amin and Lloyd 2002). Moreover, early marriage, which often coincides with or is followed closely by the beginning of childbearing, can contribute to increasing maternal

morbidity and mortality. Morbidity and mortality due to childbearing are much more common among adolescent girls than older girls (Kurz 1997; Senderowitz 1995). What's more, the younger girls marry the less power they may have within their households (Mathur et al 2003; Greene and Merrick 2005), which can make it difficult for married girls to use contraceptives to delay childbearing and to make decisions affecting themselves and their households (Greene and Merrick 2005). Furthermore, to the extent that girls' marriage signifies or follows the discontinuation of their education, delaying the age at which girls marry may also signify an increase in educational attainment for girls. An increase in girls' education is valuable in that it contributes to girls' capabilities to make decisions over their own lives (e.g., Nussbaum 2000; Arends-Kuenning and Amin 2001), and it can contribute to economic growth, both through increasing girls' decision-making and through increased investments in the next generation (e.g., Knowles 2002; Yamarik and Ghosh 2004; Klasen 2002; Hill and King 1995).

That is, the *PROGRESA* program and similar well-designed, well-targeted conditional cash transfer programs can reduce the vulnerabilities to girls and the costs to society of girls' early marriage. Moreover, conditional cash transfers create this social change effect through an intervention structured around use of specific services that are not very politically charged, like education and health services.

Not only do our results demonstrate an important 'how-to' concerning increasing the age at marriage for girls, they also demonstrate the power of well-designed poverty reduction strategies to achieve broader development goals in sensitive ways. Although *PROGRESA* set out to reduce household poverty and increase equity in the immediate term in rural Mexico, the program also has contributed longer-term benefits to girls of marriageable age. From a policy and program standpoint, *PROGRESA* was able to achieve these effects without creating the political ill-will or controversy that can accompany more traditional sexual and reproductive health programs that seek to provide adolescent girls with access to reproductive health training, contraception, and condoms. These results provide compelling rationale to use CCT programming to achieve social development goals like delayed marriage and childbearing. However, we want to stress that the positive effect of a CCT program like *PROGRESA* should not be taken as justification to reduce spending or program resources devoted to traditional sexual and reproductive health programs.

Programs that aim to delay girls' age at sexual debut, improve their contraceptive practice and the prevention of sexually transmitted infections through provision of information, skills, and services still have an important role within the development field.

Our findings also raise a number of implications for the evaluation of CCT programs.

*PROGRESA* has led to a broad range of effects and marriage wasn't a direct expected outcome. A challenge in setting up evaluations for current and future CCT programs will be thinking big about possible outcomes that may result from program activities. Such long-term possible outcomes could include marriage and childbearing for children within the target households, income benefits, health benefits, reductions in migration, changes in community norms, and reductions in gender inequality, to name only a few. Further, several authors have cited the costliness of CCTs like *PROGRESA* (e.g., Lloyd 2005). It will be a challenge to set up accurate and long-term cost-effectiveness evaluations when at least some of the benefits of a CCT program can occur much later in the future, to people who were not initially direct beneficiaries, and may not be fully anticipated.

Despite the significant potential of CCTs to improve long-term outcomes that our results demonstrate, not all CCTs are created equal. The *PROGRESA* program may have been successful in delaying marriage because it was extremely well-implemented (e.g., Adato et al 2000), reached many eligible households in the intervention areas, occurred in areas with basic health and education infrastructure, and included a range of programmatic benefits in education and health. A less well-implemented CCT program or one that focuses explicitly on delaying early marriage or increasing girls' education, like many South Asian CCTs, may not have as wide ranging positive effects. Furthermore, delayed marriage goals may or may not be better achieved through a program directly focused on delaying marriage; an important future comparison should examine whether there is any advantage to couching marriage goals within a larger poverty reduction program like *PROGRESA* when compared to a program like India's *Apni Beti Apna Dhan* program, which provided a benefit to families that accrued when a girl reaches age 18 unmarried (MODE Pvt Research, Ltd. 2000). Although *Apni Beti Apna Dhan* has the potential to have little effect since a long delay exists before the actual receipt of transfer, it may prove more

beneficial to girls since the benefits accrue outside of the context of her family, who may use money for other things besides the girl herself.

### *Policy Recommendations*

Conditional cash transfer programs can be a reasonable and effective way to improve reproductive health outcomes, which is especially relevant to any effort to delay marriage and childbearing. *PROGRESA*' focus on use of health services and education sidesteps the politics of reproductive health while bringing about multi-faceted benefits to participants. Thus, the effects and nature of the *PROGRESA* program suggests several important policy recommendations.

First, CCTs are now common throughout Latin America and much of South Asia. New York City started *Opportunity NYC*, a CCT program aimed at improving education, health, and workforce outcomes for poor families, in 2007 (News from the Blue Room, 2007). However, few CCTs outside of Latin America have been evaluated rigorously. Ongoing and new CCT programs should design and incorporate rigorous yet practical evaluations that demonstrate both the immediate and long-term benefits of the program. Moreover, some existing CCT programs are not designed in such a way that they could create maximum impact, where the receipt of cash benefit is delayed to such a long time in the future that any incentive it may provide would be so discounted that it would likely have very little effect on current behavior. Although the delay in accrual of cash transfers is one way to reduce the up-front costs of CCT programs, an extended delay may so severely limit the benefits as to render the program ineffective. Countries implementing CCTs with delayed incentive systems could consider modifying them to a benefits schedule similar to *PROGRESA*.

Secondly, countries not implementing CCT programs might consider a CCT approach – both to reduce poverty and to improve reproductive health outcomes. With significant donor and government interest in CCTs, the external environment is ripe to support this type of programming. Such programs could also prove relevant in Africa; to our knowledge no widespread CCTs exist in Africa, and countries with sufficient urban and rural infrastructure could investigate such an approach to reach development goals.

## *Conclusions*

Conditional cash transfers, when delivered in an environment with sufficient education and health infrastructure and when directed towards girls themselves, can have an important effect in reducing the likelihood that girls will marry young. Benefits to households don't always trickle down to daughters, and can leave girls vulnerable to the premature discontinuation of adolescence, early childbearing, risks of maternal morbidity and mortality, and disempowerment that can follow early marriage. Moreover, conditional cash transfers to girls offer the possibility of delaying marriage while avoiding the politicization of programs that attempt to directly delay age at sexual debut, marriage, and childbearing through provision of reproductive health skills and contraceptive information and services to adolescents. Such programming should be considered among the collection of programmatic approaches to mitigate poor reproductive health outcomes among adolescent girls.



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**Annexes: Boxes, Tables, and Figures**

Figure 1: Description of our study sample selection, individual girls. Arrows represent decision nodes, ovals represent excluded individuals, and squares represent included individuals.

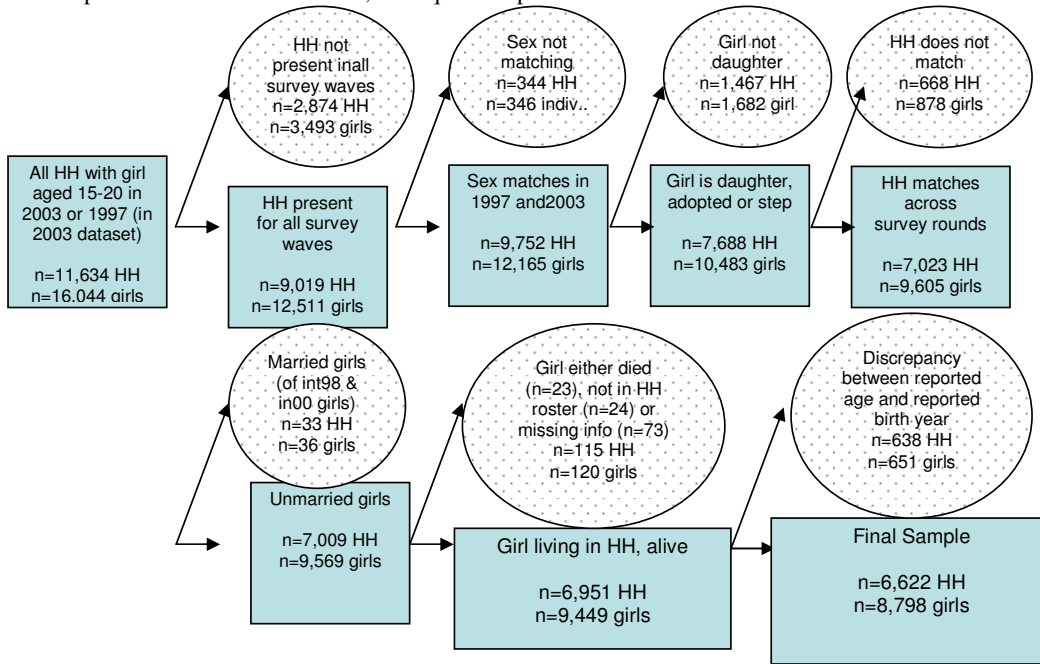


Table 1: Key Variable Definition, *PROGRESA* program evaluation, 1997, 2000, and 2003.

<p><b>DEPENDENT VARIABLES</b> (measured in 2003)          Marriage at or before age 15; girls aged 15-17 in 2003          Marriage at or before age 16; girls aged 16-18 in 2003          Marriage at or before age 17; girls aged 17-19 in 2003          Marriage at or before age 18; girls aged 18-20 in 2003</p> <p><b>PREDICTOR VARIABLES</b>  <i>Key exposure variables</i> (measured in 2000)          Household in:          1) Intervention locality in 1998 [Original Intervention]          2) Intervention locality in 2000 [Original Control]          3) Intervention locality in 2003 [2003 Control]          Household received any <i>PROGRESA</i> monetary transfer          Household received <i>PROGRESA</i> monetary transfer because of daughters' school enrollment</p> <p><i>Girl Explanatory Variables</i>          Girls' age in years in 2003          Girls' school enrollment in 1997          1) Enrolled in school          2) Not enrolled in school          9) No response</p> <p><i>Parental Explanatory Variables</i>          Mothers' education in 1997 (none; some or complete primary; some, complete or post secondary)          Father's work in the last week in 1997 (did not work; worked; has a job but did not work; worked without pay or not reported)          Father's position in 1997 (did not work/don't know/other; agricultural work; non-agricultural work; self-employed/manager/supervisor/employee; work without pay)</p> <p><i>Household Explanatory Variables</i>          Parental presence within the household in 1997          1) No parents in the household          2) Father only in the household          3) Mother only in the household          4) Both parents in the household          Household wealth index          Travel distance to school (minutes)          Number of temporary migrants in the household (0, 1-2, 3+)</p> <p><i>Community Explanatory Variables</i>          Whether agriculture is a primary activity in community in 2003 (yes; no)          Whether community has secondary school in 2003 (yes; no)          Whether community has FP services in 2003 (yes; no)          Perceived community inequality in 2003:  <ul style="list-style-type: none"> <li>• Educational (very unequal; somewhat unequal; equal)</li> <li>• Land ownership (very unequal; somewhat unequal; equal)</li> <li>• Socioeconomic status (very unequal; somewhat unequal; equal)</li> <li>• Gender (very unequal; somewhat unequal; equal)</li> </ul>         Minimum official daily wage in community in 2003</p>
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Table 2: Descriptive statistics of girls', their parents' and their households' characteristics; girls aged 15-20 in 2003 (n=8,798); *PROGRESA* program evaluation, 1997, 2000 and 2003.

		<b>n</b>	<b>Percentage</b>
<b><i>Dependent Variables</i></b>			
Girls married at or before age 15, girls aged 15-17 in 2003 (n=4,460)			
	No	4,167	93.43
	Yes	293	6.57
Girls married at or before age 16, girls aged 16-18 in 2003 (n=4,386)			
	No	3,862	88.05
	Yes	524	11.95
Girls married at or before age 17, girls aged 17-19 in 2003 (n=4,278)			
	No	3,448	80.60
	Yes	830	19.40
Girls married at or before age 18, girls aged 18-20 in 2003 (n=4,065)			
	No	2,918	71.78
	Yes	1,145	28.17
	Not reported or missing	2	0.05
<b><i>PROGRESA Exposure</i></b>			
Locality			
	Original Intervention (1998 treatment)	4,171	47.41
	Original Control (2000 treatment)	2,725	30.97
	2003 Control	1,902	21.62
Household received <i>PROGRESA</i> monetary transfer in 2000			
	No	3,435	39.04
	Yes	5,363	60.96
Household received <i>PROGRESA</i> monetary transfer because of daughters' school enrollment			
	No	6,669	75.80
	Yes	2,129	24.20
<b><i>Girl Level</i></b>			
Reported age in years in 2003			
	15	1,581	17.97
	16	1,539	17.49
	17	1,594	18.12
	18	1,512	17.19
	19	1,395	15.86
	20	1,117	13.38
School enrollment in 1997			
	Enrolled in school	8,192	93.11
	Not enrolled in school	218	2.48
	School enrollment not reported	383	4.41
<b><i>Parent Level</i></b>			
Mother's educational attainment in 1997			
	None or not reported	3,267	37.13
	Some or complete primary	5,240	59.56
	Some or complete secondary	225	2.56
	Post secondary	43	0.49
	Don't know	23	0.26

Father's employment in the last week in 1997			
	Worked in the last week	7,184	81.65
	Has a job, but didn't work last week	94	1.07
	Worked without pay	272	3.09
	Did not work	243	2.76
	Not reported	1,005	11.42
Father's position in 1997			
	Did not work, don't know, or other	1,314	14.94
	Agriculture work	5,284	60.06
	Non-agriculture work	828	9.41
	Self-employed, employee or supervisor	1,088	12.37
	Work without pay	284	3.23
<hr/>			
<b>Household Level</b>			
Parents living in household (intervention 1998 and intervention 2000 only; n=6,896)			
	No parents in HH	40	0.58
	Father in HH, no mother	81	1.17
	Mother in HH, no father	622	9.02
	Mother and father in HH	5,853	84.88
	Missing	300	4.35
Household has migrant within last year (intervention 1998 and intervention 2000 only; n=6,896)			
	No	5,254	76.19
	Yes	1,342	19.49
	Missing	300	4.35
# of migrants in last year (intervention 1998 and intervention 2000 only; n=6,896)			
	0	5,254	76.19
	1 or 2	1,188	17.23
	3+	154	2.23
	Missing	200	4.35
Household poverty classification			
	Poor	7,512	85.38
	Almost poor	870	9.89
	Not poor	408	4.64
	Missing	8	0.09

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Table 3: Descriptive statistics characterizing the communities in which girls live, n=8,798 girls; *PROGRESA* program evaluation, 1997, 2000 and 2003.

Mean household size within the community (persons) (n=8,515)		5.69	
Community has secondary school	No	5,609	63.75
	Yes	3,135	35.63
	Not reported	54	0.61
Community has family planning services available	No	4,783	54.36
	Yes	3,704	42.10
	Not reported	311	3.53
Agriculture is primary productive activity in community	No	617	7.01
	Yes	8,100	92.07
	Not reported	81	0.92
Perceived educational inequality	Very unequal	2,326	26.44
	Somewhat unequal or equal	6,418	72.95
	Not reported	54	0.61
Perceived land inequality	Very unequal	2,915	33.13
	Somewhat unequal or equal	5,820	66.15
	Not reported	63	0.72
Perceived SES inequality	Very unequal	2,826	32.12
	Somewhat unequal or equal	5,883	66.87
	Not reported	89	1.01
Perceived gender inequality	Very unequal	1,633	18.56
	Somewhat unequal or equal	7,111	80.83
	Not reported	54	0.61
Minimum official day wage (mean, in pesos) (n=8,473)		60.76	

Table 4: Univariate logistic regression of girls' very early marriage outcomes on *PROGRESA* exposure; *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(1)	(2)	(3)	(4)	(5)	(6)
Locality (ref: Original Control)	Girl aged 15-17 in 2003 married at or before age 15 (n=4,460)			Girl aged 16-18 in 2003 married at or before age 16 (n=4386)		
Original Intervention	0.879			1.00		
	(-1.35)			(0.00)		
2003 Control	0.46			0.50		
	(-4.30)***			(-4.43)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.69			1.90	
		(3.99)***			(6.07)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.58			0.58
			(-377)***			(-4.56)***
Observations	4460	4460	4460	4386	4386	4386
Robust z statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

Table 5: Univariate logistic regression of girls' early marriage outcomes on *PROGRESA* exposure; *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(7)	(8)	(9)	(10)	(11)	(12)
Locality (ref: Original Control)	Girl aged 17-19 in 2003 married at or before age 17 (n=4278)			Girl aged 18-20 in 2003 married at or before age 18 (n=4063)		
Original Intervention	0.99			1.08		
	(-0.05)			(0.77)		
2003 Control	0.52			0.562		
	(-3.76)***			(-3.61)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.75			1.62	
		(5.52)***			(5.44)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.63			0.83
			(-4.04)***			(-1.40)
Observations	4278	4278	4278	4063	4063	4063
Robust z statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

Table 6: Results from multivariate logistic regression examining the effect of *PROGRESA* exposure on whether or not girls were married at or before age 15; girls aged 15-17 in 2003 (n=4,460). *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(13)	(14)	(15)
<b><i>PROGRESA Exposure</i></b>			
Locality (ref: Original Control)			
Original Intervention	0.792 (-1.039)		
2003 Control	0.476 (-3.96)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.500 (2.93)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.565  (-3.66)***
<b><i>Parent Level</i></b>			
Mother's educational attainment in 1997 (ref: no education)			
Some or complete primary education	0.646 (-3.34)***	0.655 (-3.25)***	0.736 (-2.22)**
Some, complete or post secondary education	0.605 (-1.30)	0.644 (-1.14)	0.713 (-0.88)
Father's job position or industry in 1997 (ref: did not work)			
Agricultural work	1.058 (0.25)	1.105 (0.45)	1.159 (0.71)
Non-agricultural work	0.828 (-0.54)	0.847 (-0.48)	0.805 (-0.62)
Self-employed, employee or supervisor	0.802 (-0.73)	0.829 (-0.62)	0.863 (-0.48)
Work without pay	1.201 (0.50)	1.273 (0.66)	1.235 (0.57)
<b><i>Household Level</i></b>			
Household wealth index in 1997			
	0.525 (-3.03)***	0.572 (-2.66)***	0.516 (-3.21)***
Household poverty classification in 1997 (ref: poor)			
Almost poor	0.936 (-0.21)	0.921 (-0.27)	0.851 (-0.53)
Not poor	1.61 (1.08)	1.548 (1.00)	1.270 (0.55)
<b><i>Community Level</i></b>			
Community has secondary school (public, private, & tele) in 2003			
	0.750 (-1.88)*	0.746 (-1.95)*	0.754 (-1.81)*
Community has family planning services available in 2003			
	1.2387 (2.21)**	1.298 (2.23)**	1.404 (2.79)***
Observations	4159	4159	4159
Chi <sup>2</sup> statistic	78.43	63.92	63.68
Pseudo R <sup>2</sup>	0.0298	0.0263	0.0307
Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%			

Table 7: Results from multivariate logistic regression examining the effect of *PROGRESA* exposure on whether or not girls were married at or before age 16; girls aged 16-18 in 2003 (n=4,386). *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(16)	(17)	(18)
<b><i>PROGRESA Exposure</i></b>			
Locality (ref: Original Control)			
Original Intervention	1.020 (0.16)		
2003 Control	0.526 (-4.01)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.656 (4.77)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.543  (-5.04)***
<b><i>Parent Level</i></b>			
Mother's educational attainment in 1997 (ref: no education)			
Some or complete primary education	0.640 (-3.93)***	0.644 (-3.87)***	0.728 (-2.82)***
Some, complete or post secondary education	0.393 (-2.51)**	0.420 (-2.34)**	0.485 (-1.93)*
Father's job position or industry in 1997 (ref: did not work)			
Agricultural work	0.698 (-2.25)**	0.716 (-2.08)**	0.785 (-1.55)
Non-agricultural work	0.657 (-1.83)*	0.661 (-1.83)*	0.650 (-1.87)*
Self-employed, employee or supervisor	0.744 (-1.31)	0.771 (-1.15)	0.827 (-0.84)
Work without pay	0.521 (-2.16)**	0.559 (-1.84)*	0.553 (-1.96)**
<b><i>Household Level</i></b>			
Household wealth index in 1997	0.520 (-4.132)***	0.583 (-3.58)***	0.506 (-4.41)***
Household poverty classification in 1997 (ref: poor)			
Almost poor	0.702 (-1.62)	0.700 (-1.65)*	0.621 (-2.18)**
Not poor	0.773 (-0.71)	0.746 (-0.83)	0.609 (-1.41)
<b><i>Community Level</i></b>			
Community has secondary school (public, private, & tele) in 2003	0.983 (-0.16)	0.968 (-0.29)	0.997 (-0.03)
Community has family planning services available in 2003	1.203 (2.00)**	1.220 (2.10)**	1.321 (2.69)** *
Observations	4080	4080	4080
Chi <sup>2</sup> statistic	94.41	91.27	88.05
Pseudo R <sup>2</sup>	0.0359	0.0351	0.0376
Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%			

Table 8: Results from multivariate logistic regression examining the effect of *PROGRESA* exposure on whether or not girls were married at or before age 17; girls aged 17-19 in 2003 (n=4,278). *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(19)	(20)	(21)
<b><i>PROGRESA Exposure</i></b>			
Locality (ref: Original Control)			
Original Intervention	1.00 (0.00)		
2003 Control	0.549 (-3.57)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.606 (4.92)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.590 (-4.38)***
<b><i>Parent Level</i></b>			
Mother's educational attainment in 1997 (ref: no education)			
Some or complete primary education	0.718 (-3.58)***	0.724 (-3.47)***	0.794 (-2.54)**
Some, complete or post secondary education	0.512 (-1.96)**	0.547 (-1.78)*	0.612 (-1.43)
Father's job position or industry in 1997 (ref: did not work)			
Agricultural work	0.797 (-1.82)*	0.816 (-1.61)	0.871 (-1.11)
Non-agricultural work	0.890 (-0.58)	0.885 (-0.60)	0.865 (-0.72)
Self-employed, employee or supervisor	0.817 (-1.30)	0.841 (-1.12)	0.865 (-0.95)
Work without pay	0.765 (-1.01)	0.798 (-0.83)	0.802 (-0.83)
<b><i>Household Level</i></b>			
Household wealth index in 1997			
	0.754 (-2.70)***	0.844 (-1.62)	0.732 (-2.93)***
Household poverty classification in 1997 (ref: poor)			
Almost poor	0.701 (-2.21)**	0.703 (-2.24)**	0.632 (-2.91)***
Not poor	0.517 (-2.30)**	0.498 (-2.43)**	0.429 (-3.07)***
<b><i>Community Level</i></b>			
Community has secondary school (public, private, & tele) in 2003			
	1.081 (0.76)	1.061 (0.57)	1.080 (0.70)
Community has family planning services available in 2003			
	1.020 (0.76)	1.088 (0.82)	1.149 (1.30)
Observations	3954	3954	3954
Chi <sup>2</sup> statistic	57.70	61.03	62.68
Pseudo R <sup>2</sup>	0.0235	0.0231	0.0223
Robust z statistics in parentheses;			
* significant at 10%; ** significant at 5%; *** significant at 1%			

Table 9: Results from multivariate logistic regression examining the effect of *PROGRESA* exposure on whether or not girls were married at or before age 18; girls aged 18-20 in 2003 (n=4,063). *PROGRESA* program evaluation, 1997, 2000 and 2003.

	(22)	(23)	(24)
<b><i>PROGRESA Exposure</i></b>			
Locality (ref: Original Control)			
Original Intervention	1.086 (0.79)		
2003 Control	0.649 (-3.23)***		
Household received <i>PROGRESA</i> monetary transfer in 2000		1.459 (54.44)***	
Girl's household received benefits from <i>PROGRESA</i> in 2000 because she was in school			0.769  (-1.94)*
<b><i>Parent Level</i></b>			
Mother's educational attainment in 1997 (ref: no education)			
Some or complete primary education	0.807 (-2.85)***	0.818 (-2.67)***	0.855 (-2.12)**
Some, complete or post secondary education	0.599 (-1.68)*	0.645 (-1.47)	0.670 (-1.34)
Father's job position or industry in 1997 (ref: did not work)			
Agricultural work	0.843 (-1.45)	0.853 (-1.32)	0.883 (-1.03)
Non-agricultural work	1.027 (0.15)	1.012 (0.07)	0.996 (-0.02)
Self-employed, employee or supervisor	0.879 (-0.96)	0.905 (-0.73)	0.906 (-0.72)
Work without pay	0.979 (-0.09)	0.987 (-0.06)	1.036 (0.11)
<b><i>Household Level</i></b>			
Household wealth index in 1997			
	0.787 (-2.66)***	0.859 (-1.68)*	0.777 (-2.77)***
Household poverty classification in 1997 (ref: poor)			
Almost poor	0.752 (-2.10)**	0.760 (-2.06)**	0.700 (-2.68)***
Not poor	0.527 (-2.68)***	0.509 (-2.76)***	0.470 (-3.19)***
<b><i>Community Level</i></b>			
Community has secondary school (public, private, & tele) in 2003			
	1.143 (1.54)	1.125 (1.34)	1.128 (1.30)
Community has family planning services available in 2003			
	1.028 (0.34)	1.036 (0.43)	1.078 (0.87)
Observations	3748	3748	3748
Chi <sup>2</sup> statistic	51.22	48.37	41.88
Pseudo R <sup>2</sup>	0.0186	0.02180	0.0141
Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%			