Are You (Not) Expecting? The Unforeseen Benefits of Job Training on Teenage Pregnancy[†]

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Abstract

Teenage pregnancy in the Dominican Republic represents a persistent development challenge. This paper uses data from a randomized impact evaluation of a youth training program, the *Juventud y Empleo* program, which includes soft skills training, to examine its impact on teenage pregnancy. We find that the program reduces the probability of teenage pregnancy by 8 percentage points (about 20 percent), particularly among not already mothers. The program affects teenage pregnancy through improvements in non-cognitive skills and expectations, among others channels. We also provide evidence that the program has no effect on parenthood by young (and old) males.

Keywords: teenage pregnancy, youth training programs, socio-emotional skills, soft skills, life skills, Dominican Republic.

JEL Classification: J24, J64, O15, O17

1. Introduction

Latin American and Caribbean countries have a persistent problem of high teenage pregnancy rates: 71 births per 1,000 women between 15 and 19 years of age in 2011. That places Latin America and the Caribbean (LAC) as the second region with the highest rate, being surpassed only by Sub-Saharan Africa (with 110 births). This problem is especially worrying in the Dominican Republic, which shows one of the highest teenage pregnancy rates in LAC. In 2011, the teenage pregnancy rate was 104 births per 1,000 women ages 15-19 (see Annex I, Figure 1), far above the average rate for the region, which is 71 births per 1,000 women ages 15-19. In addition, the high pregnancy rate in the Dominican Republic is persistent over time, decreasing marginally from 109 births per 1,000 women in 2001 to 104 births per 1,000 women after one decade (see Annex I, Figure 2).

Teen pregnancy (and motherhood) is, without a discussion, a serious social problem. However, the determinants of the teenage pregnancy and early childbearing are still in discussion. Wolfe et al (2001) summarize the economic literature about this matter, dividing the findings by generations of studies. The first generation studies used cross-sectional data and reduced-form estimation to relate background and family characteristics to a non-marital birth variable (e.g., Hogan and Kitagawa, 1985). This generation of studies found positive correlations between non-marital birth probabilities and a set of parental and background circumstances experienced during childhood. A second generation of studies[1] used longitudinal data with more information on children's background to deeply explore the effects of background and family characteristics and choices on non-marital births.[2] Almost all of these studies employ reduced-form estimation techniques. In these two generation of studies, the main findings are that: (i) family characteristics have a substantial influence on teen non-marital birth (mother's education is negative and significant, parental income is negative and usually significant, source of family income is positive and significant, etc.); (ii) other indicators also matter such as family structure, family stress factors, parental attitude, expectations, monitoring and control of children and contraceptive practice; and (iii) welfare programs have an effect but the studies are not

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[1] Lundberg and Plotnick (1990, 1995), Plotnick (1992), An et al. (1993), Moffitt (1994), Haveman and Wolfe (1994) and Acs (1996).

[2] For the US, the studies usually include the analysis of how welfare and family-planning policies impacted teen non-marital childbearing.

conclusive about their impact. These studies use different methods (OLS, probit, logit, simultaneous equations, etc.) but they have in common that there are concerns about issues of endogeneity, unobserved variables, and model identification. None of the studies use a dynamic framework to study the determinants of choices related to teen non-marital birth. A third generation of studies is composed by those that use structural model estimation to relate teen women's fertility decisions to the choice-conditioned opportunities and constraints that women have (e.g., Duncan and Hoffman, 1990; Rosenzweig, 1999; and Clarke and Strauss, 1998). Wolfe et al (2001) extend this third generation of studies to measure the effects of an extensive list of factors[3] and find that conditional income expectations are important determinants of the childbearing choice. An increase in the perceived costs associated with the occurrence of a teen birth decision would lead to a reduction in these risky behaviors, and to a lower probability of a non-marital birth event.

On the other hand, there is also a debate about the impacts of teenage pregnancy and early childbearing on labor market outcomes of young girls. According to Hoffman (1998), there is not a clear consensus on the evidence of the average impacts of teenage childbearing. This is because it is difficult to disentangle the effects of having a baby early in life from other characteristics that are shared by those who make those decisions (they usually grew up in poor families and tough neighborhoods). Early studies (in the 1970s through the mid-1980s) tried to deal with causality issues, controlling for characteristics that could differentiate women with a teenage birth from those who did not have a teenage birth. However, these studies were unable to control for enough factors to be able to establish causality. A second generation of studies attempted to solve these problems by finding better "natural" comparison groups (Geronimus and Korenman, 1990; Grogger and Bronars, 1993; Hotz, McElroy and Sanders, 1997). These studies cast some doubt on the studies of the consequences of teenage childbearing, but at the same time, have some problems of external validity that make us think if they could inform us in terms of public policy design. Hoffman (1998) bottom line is that current research no longer supports the notion that teenage childbearing is a destroying event. According to his review of the literature, the new research appropriately recognizes the importance of other factors (especially family and individual characteristics that are difficult to measure) to the poor average

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[3] Including the girl's family characteristics and its choices, the socio-economic environment in which she lives, policy-related factors such as public expenditures on family-planning programs and her own prior choices.

outcomes of teenage mothers. However, he concludes that there is not compelling evidence that causal effects of teenage parenting are positive, zero or even just marginally negative.

A more recent study for Germany (Cygan-Rehm and Riphahn, 2014) also studies teen births and shows that the driving factors observed in the international literature can be confirmed for teenage fertility in Germany. More specifically, age, education and parental background are correlated with fertility outcomes. They also find that teen pregnancies increase in times of high (youth) unemployment. This could suggest that opportunity costs matter. In a positive note, teen births may decline if disadvantage youth enter the labor market more easily and see lifetime opportunities for themselves (or have higher expectations about the future).

In the case of Latin American and Caribbean countries, recent evidence shows the impact of teenage pregnancy on socio-economic outcomes. For example, in the case of Mexico, in the short run, teenage pregnancy seems to reduce years of schooling, school attendance, and hours of work, while it increases marriage rates. In the long run, this results in a loss in years of education and in lower per capita household income. It also contributes to a higher probability of being married and divorced (Arceo-Gomez and Campos-Vazquez, 2011). In Chile, Kruger and Berthelon (2012) find that teenage motherhood significantly reduces the probability of high school completion. A recent regional study for LAC about teenage pregnancy[4] reveals that it seems like the main cause of this phenomenon is not lack of information about planning methods. A big percentage of the girls that were interviewed in this regional study reveal that they know how to prevent a pregnancy, but they do not use these methods. In the Dominican case, according to Carrasco (2012), the new paradigm of the problem of teenage pregnancy goes along that same line of "lack of life projects" for the adolescent population. To illustrate that, according to data from ENDESA from 2002-2007, 52.6 % of adolescent pregnancy classify their pregnancies as "wanted pregnancies". The decision to have a child at such an early age could be associated to lack of incentives to go to school, or a perceived lack of opportunities, especially among the poorest. Carrasco (2012) also uses data from the 2010 Social Protection Evaluation Survey and finds that teenage pregnancy rates are higher for those living in poverty conditions compared to those living above the poverty line. The author argues that young girls, who are usually low-educated and lack the skills necessary to enter the labor market, also face another

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[4] Näslund-Hadley, E. and Binstock, G (2011). *El fracaso educativo: Embarazo para no ir a clase.*

restriction, which is to have to take care of a child. For these girls, day care centers are not only scarce and geographically far away, but also unaffordable.

In this sense, one path toward preventing a young girl from taking early decisions about having a child is to change her life expectations, self-esteem and perceptions of what she can do with her future. In other words: increasing the opportunity cost of having a child early in life. Empirical studies from the US and the UK show that teenagers' attitudes and expectations about their future affect the probability of pregnancy (Plotnick, 1992, 1993, 2007). In that sense, programs that support the development of soft skills[5] and increase expectations about the future are expected to have a positive effect on preventing teenage pregnancy. Life-skills training programs are one example of interventions that generate changes in expectations and socio-emotional skills such as self-esteem, responsibility and perseverance. The Youth and Employment Program (JE, because of its name in Spanish) in the Dominican Republic, which is analyzed in this paper, is one of these programs. An earlier evaluation of the JE program shows that the training impacts on the development of both soft skills and expectations about the future (Ibarraran et al, 2014).

Young people in Latin America and the Caribbean are facing disproportionate difficulties in the labor market. As many as 73 million young people aged 15 to 24 are unemployed and many of those employed have jobs of poor quality. Poor quality of employment among youth is an acute problem in the developing world, where an increasing number of young people are turning to part-time, temporary and informal forms of employment (ILO, 2010). There is also a high percentage of youth that is neither working nor studying, and many of them are not looking for a job. To address this, some LAC countries have implemented, since the early 1990s, a wide range of policies, the most common being the implementation of job training programs specially tailored for youth. These programs regularly target vulnerable youth and include training in soft and technical skills plus an apprenticeships or internships in a private sector firm.[6] The academic literature agrees that there is a positive relationship between possessing these skills and having

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[5] There are many terms that are used in reference to "soft-skills". Sometimes they are called socio-emotional skills, non-cognitive skills, personality traits and life-skills. They are those skills related to attitudes and behaviors and they differ from cognitive skills that refer to the ability to learn and are related to the intellectual coefficient.

[6] See Gonzalez-Velosa et al. (2012) for an in-depth analysis of six job training programmes for youth in Latin America and the Caribbean, using as inputs the results from impact evaluations, a qualitative fieldwork and a statistical analysis of surveys to firms and programme beneficiaries. Other important references are Heckman, Lalonde, and Smith (1999) for a general overview of training programs, and Betcherman, Olivas, and Dar (2004) for a recent summary that includes some evaluations of developing country training programs.

higher probabilities of finding a good job and maintaining it for a longer time (Heckman et al.2006; Urzua, 2009; Fazio, 2011), and therefore it is of utter importance to provide them and also to develop them in an effective way. Focusing on socio-emotional skills has become increasingly important for these programs (Ibarraran and Rosas, 2009; Gonzalez-Velosa et al., 2012). In this sense, different training programs in the region have improved the provision of these services and expanded the number of training hours dedicated to them.

One of these youth-training programs is the Dominican Republic's *Juventud y Empleo* program. JE was the first program of the Region to have an experimental evaluation design from its inception. While previous evaluations of these programs have focused almost exclusively on the labor market impacts (employment rate, labor earnings and quality of employment), Ibarraran et al. (2014) also report on the mechanisms by which training is supposed to improve participants' labor market performance, specifically, by increasing the skills with which they join the labor force, particularly non-cognitive and socio-emotional skills. They also preliminary examine other important outcomes that can be attributed to training, such as changes in teenage pregnancy rate and consumption of alcohol, cigarettes, drugs and lottery.

This paper studies the effects of JE on teenage pregnancy. It builds on the analysis of Ibarraran et al. (2014) to study more in detail heterogeneities on how the treatment affects teenage pregnancy (by civil status, soft skills, number of children, expectations and the locking-in effect). In particular, we investigate how family factors such as civil status and number of children mediate in this effect. Most importantly, in this paper we devote particular attention to the channels through which the JE affects teenage pregnancy. In this sense, we explore changes in time-use, expectations and non-cognitive skills. Our paper differentiates from the one of Ibarraran et al. (2014) mainly in that: (i) we consider the history of pregnancies and not only if a women is currently pregnant at the moment of the follow-up; and, (ii) we are also able to explore the effect of JE on males parenthood.

The vast majority of the previous studies are based on associations between pregnancy and other variables. These papers find difficulties to solve the potential endogeneity problem of unobserved factors affecting both pregnancy and other variables, such as participation in a training program. We use the randomized experiment data of the JE program, which allow us to identify the causal effect of the program on pregnancy. This paper contributes to a better understanding of how a training program that includes training in socio-emotional skills could

impact teenage pregnancy. At the same time, it enriches the discussion about the topic and increases the existing knowledge about which elements are important in the agenda of reducing teenage pregnancy in developing countries.

Our analysis is based on a sample of applicants for the cohort of trainees that participated in the 2008 version of the JE program that was modified as a result of the first impact evaluation.[7] We show that the program reduces the probability of pregnancy for all women, but is particularly stronger within teenagers (reduction of about 8 percentage points or women in the treatment group are 20 percent less likely to be pregnant than those in the control group) and this effect is stronger for single women and those who are not already mothers. The channels through which the program reduces pregnancy are improvements in non-cognitive skills and expectations, among others. Moreover, the JE have larger effects on teenagers whose initial self-esteem was not too high or too low and among teenagers coming from poorer households.

The rest of the paper is organized as follows. Section 2 describes the JE program, its previous evaluations, and the most important design features of this evaluation and the data collected. Section 3 presents the empirical strategy, Section 4 presents the results, and, Section 5 concludes.

2. The Youth and Employment Program (*Juventud y Empleo*)

The *Juventud y Empleo* (JE) program is a Dominican youth training program that aims to increase the probability of getting a good-quality job of youth between 16 and 29 years of age who did not complete high school. It started in 2001 and it was the first job training program in Latin America to have a randomized impact evaluation design.

The program offers 75 hours of life skills training plus 150 hours of technical or vocational training in a wide variety of courses (e.g. administrative assistant, baker, hair stylist, clerk, auto mechanic, bartender). While basic skills-training includes the strengthening of socio-emotional and basic cognitive skills, vocational training addresses technical training tailored to the needs of employers. More specifically, JE provides training in the following basic and socio-emotional skills: (i) planning skills: development of their personal life project; (ii) basic cognitive skills: management of basic math and communication skills; (iii) social skills: improvement of management of social risk situations as well as prevention and conflict negotiation skills; (iv)

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[7] The first evaluation corresponds to Card et al. (2011).

skills for productive work: promotion of decision-making in the workplace skills, team collaboration and the ability to work with efficiency and quality; and (v) sensitivity to gender equality and respect of the environment (Portorreal, 2010).[8]

The two skills training components of the JE are provided by private training institutions (*Centros Operadores del Sistema*, COS) that are registered and approved by the national training institution (*Instituto Nacional de Formación Técnico Profesional*, INFOTEP). Training at the COS is followed by a three-month internship in a private sector firm. This internship is identified by the COS and the objective is to provide training programs tailored to the firm's labor demand. Each COS makes an open call for applicants, and then young people are identified by the COS according to their preferred career and the availability of the desired course. Once they reach 35 potential participants, the COS sends the names and identification numbers to the program coordinating unit (PCU), which randomly selects those who are offered the training course.

Previous evaluations of the program include the analysis of two samples. The first impact evaluation of this program (Card et al., 2011) evaluated a sample of applicants who applied to receive training in early 2004 and were followed by mid-2005 (10 to 14 months after most trainees had finished their training). This evaluation showed little impact on employment but it showed some impacts on hourly wages and earnings (10 percent impact). The evaluation also showed modest impacts on formality for men. Formality was proxied by the probability of holding of a job that offers health insurance.[9] The second impact evaluation of the program (Ibarraran et al., 2014) used data from 2008-2010 and finds that the program has a positive impact on quality of employment (positive effect on job formality for men of about 17 percent and there is a 7 percent increase in monthly earnings among the employed individuals), but it does not have an impact on employability (no overall impacts on employment rates). With respect to unexpected impacts of the program, Ibarraran et al (2014) find that the program reduces teenage pregnancy by 5 percentage points in the treatment group (about 45 percent). These findings are consistent with increments in youth expectations that result from the program, as well as in soft skills (as measured by three scales: Social and Personal Competencies (CPS), Rosenberg and Grit scales).

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[8] Trainings did not explicitly include sex education in their curriculum.
[9] During the first evaluation of the program, there was a difficulty because in the follow-up survey people who were originally assigned to receive training but failed to show up or those who attended only briefly were not included in the survey, and this fact could have compromised the randomized design of the JE evaluation. .

This paper and Ibarraran et al (2014) evaluate a version of the program that is modified from the original version that was the subject of the first evaluation done by Card et a. (2011). The evaluation design was also different from the original. Even though the JE maintains its two-stages training followed by an internship in the private sector, and the evaluation is still based on random assignment, there were some important changes. Among them, the most important were the following: (i) COS worked closer to the private sector companies in order to have an internship experience much more tailored to the needs of the firm; (ii) the soft-skills training was modified, better structured and homogeneously provided by the COS, given the fact that the firms expressed that life skills were highly valued and even more than the technical training aspect of JE;[10] (iii) the sample for the random assignment was larger for each course (20 treatments, 15 controls); and (iv) in general, several aspects of the evaluation were improved such as the sample size, the survey instruments, and the way in which the field work was controlled.

Given a certain group of eligible participants, the random assignment was performed. The eligible participants were identified by the COS, and had to meet some criteria: i) being 16 to 29 years of age; ii) living in poor neighborhoods; iii) not currently attending school; iv) with incomplete high school education or less; v) currently unemployed, under-employed or occupationally inactive; and vi) hold a Dominican identity card.[11] The process was as follows: once the program received the information from the COS and verified that none of the applicants had been registered before, for each course, the COS sent data on 35 eligible and interested young and received from the CPU the list of people randomly assigned to one of the two groups. The first group was formed by 20 young people for whom the program was offered. The second group was assigned as the control group. In case that young people were offered the program but did not respond or drop out before the tenth day of classes, the COS could replace up to five spaces with people from the control group. Even though the replacements were originally thought to be randomly selected by the PCU, who was supposed to provide the names directly to

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[10] Martinez (2013), based on a complementary evaluation that analyzes a different cohort of trainees separates the the life skills training versus the traditional training that is the combination of life skills plus technical skills. Their preliminary results suggest that there is additionality coming from the technical training. Fazio (2011) performed a qualitative analysis of JE, and gives us additional evidence on the fact that firms value more the life skills component than the technical training component.

[11] Membership in poor households was related to the location of young people across the country and a normative priority established by the national government. In a targeting report, it was revealed that 72 percent of the postulants met the location criteria but only 40 percent were poor (Morillo, 2010).

the COS; in practice, the COS experienced some degree of discretion in selecting the replacements. Given that this is unknown to us, it might have led to selection bias. Given this issue, we will use the original random assignment to estimate the Intention-to-Treat (ITT) effect. Doing so, we avoid concerns about potential selection bias.

3. Empirical Strategy

After the random assignment into the treatment or control groups, some people decided not to attend the courses or dropped out during the first week of classes. At the same time, some of those assigned to the control group finally received the treatment. According to administrative and follow-up data, Ibarraran et al. (2014) report that there was imperfect compliance: 22 percent of those originally assigned to the control group ($Z_i = 0$) ended up being contacted by the COS and accepted the course, while 17 percent of those originally assigned to the treatment group ($Z_i = 1$) were not contacted or did not start the course.

As it was mentioned before, given that the mechanism through which the replacements and other causes of imperfect compliances are unknown, our estimates will only consider what happened at the random assignment. In this sense we will estimate the Intention-to-Treat (ITT) effects of offering the JE program.[12] The ITT estimates yield the causal effect of Z_i (Duflo et al., 2006), and its estimation includes the group of eligible people that participated in the random assignment, including the no-compliers. It is expected that the effect of offering JE becomes smaller to the extent that the proportion of those no-compliers increases. The ITTs are estimated by Ordinary Least Squares (OLS).

Data came from two sources: (i) baseline data were collected at the registration at the COS; and (ii) in contrast, the follow-up data corresponds to a sample of 5000 individuals (out of the 10,309 registered), surveyed 18-24 months after the completion of the courses, between November 2010 and February 2011. The attrition rate between waves was about 20 percent and is statistically similar in the two treatment groups (80.4 percent of those in the control group and 80.8 percent of those in the treatment group were interviewed in the two waves). The final sample consists of 2338 women (75 percent of all women in the sample) with complete information in all the variables used in the analysis.

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[12] Tables A1 and A2 in the Appendix the sample balance in the complete sample of women and only teenagers.

$$pregnant_{ic} = \alpha + \beta Z_i + \gamma t_i + \delta_c + \varepsilon_{ic} \tag{1}$$

The dependent variable in equation (1) corresponds to a dummy variable for whether a woman is pregnant; Z_i corresponds to the random assignment to the control or treatment group; t is a dummy variable that takes the value of 0 when the follow-up information was collected in the last two months of 2010 and the value of 1 when it was collected in the first two months of 2011; δ_c is a course fixed effect; and, ε_{ic} is an individual error term.

Even though the assignment into treatment was random, we include individual characteristics (whether the woman was married/cohabiting; and number of children), which might be correlated with the pregnancy outcome. This potentially helps gaining precision in the point estimates of JE. These variables, included in X_i, are separately included in the estimation of equation (2).

$$pregnant_{ic} = \alpha + \beta Z_i + \rho X_i + \gamma t_i + \delta_c + \varepsilon_{ic} \tag{2}$$

In addition, to explore the channels through which the JE affects teenage pregnancy, the analysis uses a set of rich information contained in the follow-up survey. In particular, we use information of the following modules: time-use (regarding the last working day); expectations; and non-cognitive skills (CPS, Rosenberg and Grit scales). These j variables are the dependent variables estimated separately using equation (3).

$$y_{ic}^{j} = \alpha + \beta Z_i + \gamma t_i + \delta_c + \varepsilon_{ic} \tag{3}$$

From the expectations module, we compute an index (using principal component analysis) combining the responses to a set of questions regarding expectations of personal life (finishing a educational level higher than the current one; living in a better neighborhood and having the desired house or car; having his/her own business; having the desired job position; having his/her professional aspirations realized; and, having his/her personal aspirations realized).

Regarding the measures of non-cognitive skills, we use the CPS, Rosenberg and Grit scales, which were standardized within the samples of men and women in the follow-up survey and transformed so higher values indicate higher levels of the dimension measured. Brea (2011)

presents a detailed discussion of the construction, reliability and interpretation of the three scales for the sample of JE. The CPS scale measures different dimensions of social and personal competencies, related to attitudes and values, including: leadership; communication and social acceptance; ability to establish social relationships; empathy and communication; self-esteem; order; organization; and conflict resolution skills. The Rosenberg scale intends to measure self-esteem trough a scale that includes items answered on a four-point scale — from strongly agree to strongly disagree.[13] The scale measures state self-esteem by asking the respondents to reflect on their current feelings. Finally, the Grit scale (Duckworth et al, 2007) measures perseverance on the efforts or passion for long-term goals and consistency of the interest, which are considered very important skills for achieving goals. The Grit scale is a multiple choice test with five possible answers from "no similar to my personality at all" to "very similar to my personality".

We also estimate a Seemingly Unrelated Regression Equations (SURE) model, where we put as a system of equation the effect of JE on pregnancy and the non-cognitive and expectation channels. This model also takes into account the potential correlation between the error terms of these equations.

Finally, using the following specification, we explore whether the JE affects teenage pregnancy heterogeneously by the mentioned channels:

$$pregnant_{ic}^{j} = \alpha + \rho X_i + \tau y_i^{j} + \beta(Z_i * y_i^{j}) + \gamma t_i + \delta_c + \varepsilon_{ic} \qquad (4)$$

The variables included in X_i are whether the woman is married\cohabiting and whether she is already mother or not. The y_i^{j} variables separately estimated in this equation are the already mentioned measures of non-cognitive skills, and an index of expectations of personal life.

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[13] The JE evaluation questionnaire collected the 10 items of the RSE scale. Specifically, individuals were asked to report how much they agree (in a four points scale: 1-strongly agree; 2-agree; 3-disagree; and, 4-strongly disagree) with each of the following statements: (1) on the whole, I am satisfied with myself; (2) at times, I think I am no good at all; (3) I feel that I have a number of good qualities; (4) I am able to do things as well as most other people; (5) I feel I do not have much to be proud of; (6) I certainly feel useless at times; (7) I feel that I am a person of worth, at least on an equal plane with others; (8) I wish I could have more respect for myself; (9) all in all, I am inclined to feel that I am a failure; and (10) I take a positive attitude toward myself.

4. Results

This section presents the OLS estimates of the ITT effect of the JE program on pregnancy.[14] The analysis of the channels through which the program affects pregnancy is also presented. In all the specifications the standard errors are clustered at the course level. A time dummy for whether the follow-up interview took place in 2011 is also included in all the models.

Table 1: Overall JE effects on pregnancy

Intention to Treat Effects	(1)	(2)	(3)
	All	Age	Age
Pregnancy	women	16-19	20-30
Treatment	-0.0268	-0.0779*	-0.0092
	(0.0203)	(0.0414)	(0.0238)
Mean dep. var for control group	0.350	0.389	0.337
Observations	2,227	564	1,663

Note: robusted standard errors dustered at the course level in parentheses.
*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table 1 shows the ITT effects of the JE training program on pregnancy (equation 1 in Section 3). Similar to the findings of Ibarraran et al. (2014), we find that the program reduces the likelihood of pregnancy in about 3 percentage points for all women. However, as models (2) and (3) show, this is driven by the youngest group of women. The JE program reduces the probability of pregnancy in 8 percentage points (20 percent higher) for teenagers aged 16–19 years, while it has no effect on women aged 20-30 years.

The following tables focus on the youngest sample. Table 2 explores whether the significantly negative effect of JE on teenage pregnancy holds, after controlling for covariates associated to family characteristics and the probability of pregnancy. This table shows the estimation of equation (2) where x_i corresponds either to a dummy variable for whether the woman is married\cohabiting (Model 1, on the left) or to the number of children (Model 2, on the right).

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[14] Table A.3 in the appendix shows that a Probit estimation brings similar results to the linear model. Tables A5 and A6 show that the JE doesn't affect the probability of fatherhood or motherhood.

As expected, being married or cohabiting increases the probability of pregnancy among all teenagers.[15] Even though JE does not affect married\cohabiting and "single" women differently (coefficient on the interaction term in Model 1) Table 2 shows that the JE decreases the probability of teenage pregnancy for "single" women.

Table 2: JE and family characteristics effects on pregnancy

Intention to Treat Effects **Pregnancy**	(1)	(2)
Treatment	-0.0776	-0.1087**
	(0.0473)	(0.0482)
x_i	0.1286	0.0110
	(0.0793)	(0.0567)
Treatment*x_i	0.0508	0.1024
	(0.1072)	(0.0764)
Mean dep. var for control group	0.389	0.389
Observations	564	564

Note: x_i corresponds to a dummy variable for whether women is married\cohabiting in model (1) and to the number of children in model (2). Robust standard errors clustered at the course level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

On the other hand, Model 2 shows that the JE reduces the probability of pregnancy for the teenagers who are not mothers already.[16] JE also seems to reduce the probability of pregnancy for teenagers who are not mothers in about 11 percentage points (coefficient on Treatment). In general, having an extra child reduces the probability of pregnancy for all the teenagers in the sample, but this negative effect is larger within teenagers in the treatment group.[17] The results point out that the effects of the JE program are larger among teenagers (16-19 years old), who are not married or cohabiting and have already children.

We turn now to analyze the effect of JE on the theoretical channels through which the program might affect teenage pregnancy. Table 3 corresponds to the estimation of equation (3), for the different dependent variables y_i (CPS score, the Rosenberg scale, the Grit scale, and an

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[15] The linear combination of the coefficient on 'Women married or cohabiting' and 'Women married or cohabiting*Treatment' is 0.1256, significant at the 99% level.

[16] The linear combination of the coefficient on 'Treatment' and 'Number of children *Treatment' is -0.0619, significant at the 95% level.

[17] The linear combination of the coefficient on 'Number of children' and 'Number of children *Treatment' is -0.0124 and no significant at the usual levels.

expectations index). In terms of soft-skills, JE substantially increases the CPS and Grit scores. Similarly, it increases the teenagers' expectations about their future. On the other hand, we find evidence that JE does not affect the Rosenberg self-esteem scale or the total leisure time of teenagers.[18]

Table 3: JE effects on channels

Intention to Treat Effects	(1) Total CPS score	(2) Rosenberg scale	(3) Total Grit scale	(4) Expectations index
Treatment	0.1725**	-0.0102	0.2119**	0.3035***
	(0.0788)	(0.0733)	(0.0924)	(0.0888)
Mean dep. var for control group	-0.0241	0.128	-0.124	-0.175
Observations	564	564	564	564

Note: Robust standard errors clustered at the course level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

The results of Table 3 point out that the negative impacts of the JE on teenage pregnancy happen through non-cognitive skills and expectation.[19] To further explore the simultaneous effect of JE on the non-cognitive skills and expectation channels and pregnancy, in Table 4 we show the results of a SURE model, where we estimate a system of five equations and take into account the correlation of the error terms of each equation. The Breusch-Pagan test at the bottom of Table 4 confirms that the error terms of these equations are not independent. In addition it shows that even considering the impact of JE the non-cognitive skills and expectation channels, JE reduces teenage pregnancy, which indicates that JE affects it through other channels as well.

Table 4: SURE estimation of the effect of JE and soft-skills channels

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[18] JE does not have any significant effect on leisure time devoted to social activities nor on time devoted to being with teenager's partner\boy-girlfriend (results available upon request).

[19] Table A4 in the appendix shows that JE has a similar effect on females' and male's CPS. In contrast to the sample of women, the JE affects males self-esteem and doesn't affect their Grit or expectations.

	(1) Pregnancy	(2) Total CPS score	(3) Rosenberg scale	(4) Total Grit scale	(5) Expectations index
Treatment	-0.0742*	0.1692**	-0.0178	0.2078**	0.3052***
	(0.0416)	(0.0822)	(0.0787)	(0.0862)	(0.0865)
Observations	563	563	563	563	563
Breusch-Pagan test of independence: chi2(10)=385.940, Pr=0.0000					

Finally, Table 5 explores in more detail how the JE program affects pregnancy through the non-cognitive channels and a wealth index of the household. We exploit that, at baseline, the JE collected the wealth index and the Rosenberg's scale for all individuals in the sample. Therefore, Table 5 corresponds to the estimation of equation (4) of pregnancy as a function of the treatment; the score on the Rosenberg's self-esteem scale or the wealth index; the interaction of these terms; dummies for whether the teenager is married\cohabiting and whether she is already a mother or not; a time dummy for whether the follow-up interview took place in 2011; and fixed effects at course level.

The top part of Table 5 shows the evaluation of the treatment effect at different points of the distribution of the Rosenberg's scale or the wealth index. The bottom part instead shows the interaction term of the Rosenberg's scale or the wealth index and Treatment, and the marginal effect of the corresponding indicator for teenagers in the control group.

Table 5: JE effects on pregnancy through self-esteem

	Rosenberg' scale		Life Quality Index	
	coef.	SE	coef.	SE
Treatment at percentil 5 of xi	-0.1215	(0.0892)	-0.2675***	(0.0845)
Treatment at percentil 10 of xi	-0.1095	(0.0715)	-0.2223***	(0.0699)
Treatment at percentil 25 of xi	-0.0884*	(0.0468)	-0.1519***	(0.0517)
Treatment at percentil 50 of xi	-0.0733*	(0.0414)	-0.0728	(0.0457)
Treatment at percentil 75 of xi	-0.0552	(0.0539)	-0.0005	(0.0575)
Treatment at percentil 90 of xi	-0.0552	(0.0539)	0.0688	(0.0778)
Treatment at percentil 95 of xi	-0.0492	(0.0611)	0.1137	(0.0930)
xi when Treatment=0	-0.0106	(0.0083)	-0.0123**	(0.0050)
xi*Treatment	0.0060	(0.0104)	0.0141**	(0.0057)
Observations	564		478	

Note: x_i corresponds to Rosenberg's scale score. Robust standard errors clustered at the course level in parentheses. Other covariates included are: whether woman is married\cohabiting; and, whether is pregnant of the first child. ***p<0.01, **p<0.05, *p<0.1.

Table 5 shows that the difference in the effect of self-esteem on pregnancy between treatment and control groups is not statistically significant at traditional levels. However, the protective role of self-esteem for the treatment group, relative to the control group, seems to increase when the Rosenberg's test score is not too high or too low. Differences between control and treatments are statistically significant at percentiles 25 and 50). Teenagers with initial higher self-esteem taking the JE training are about 4 to 6 percentage points less likely of being pregnant than those in the control group (difference in levels). On the other hand, JE reduces more the probability of pregnancy for those teenagers coming from poorer households.

The results point out that the effects of the JE program are larger among teenagers (16-19 years old), who are not already mothers. Moreover, the evidence suggests that the negative effect of JE on pregnancy is largest for teenagers with initial medium levels of self-esteem and from poorer households.

5. Conclusions and future research

This paper examines more thoroughly the impact of the *Juventud y Empleo* training program in the Dominican Republic on teenage pregnancy. The program's components of soft skills and technical training are expected to have an impact on labor market outcomes but they could also impact other unexpected outcomes, for instance risky behaviors such as cigarette, alcohol and drug consumption, sexual behavior and teenage pregnancy.

Our results show that the JE program reduces the probability of pregnancy by about 3 percentage points for all women and these impacts are much larger for women aged 16-19 (8 percentage points or 20 percent) and for those who are not mothers already. We also find that the program improves the non-cognitive skills of young women (measured through different scores) and their expectations about the future. Finally, we find that the effect of JE through these channels is not homogeneous. In particular, we find that the JE reduces more the pregnancy probability of teenagers whose initial self-esteem scores (measured by the Rosenberg's scale) are not too high or too low and those coming from poorer households.

Even though our analysis shows important effects of the JE on teenage pregnancy, it has some limitations that are worthy to discuss. First, we are not able to disentangle which of the

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components of the JE, or what combination of them, is affecting teenage pregnancy. A second but less important concern is that the number of women aged 16-19 in our sample is reduced.

According to World Bank (2012), poverty and lack of opportunities in the labor market are directly associated to teenage pregnancy and early motherhood and they can become impediments to women wanting to take full advantage of development opportunities. The authors divide their policy options in two sets: there is the typical intervention that is directed to provide health access to contraception and more information about how to use contraceptives, and there is another (more recent) set of policy option related to incrementing education and labor market opportunities for women.[20]

Even though a variety of interventions have been used to reduce fertility among adolescents, only a few have a rigorous impact evaluation studies. This paper is one of the few attempts to understand better how a youth training program can impact teenage fertility decisions.

Programs that aim to improve teenage access to employment, such as youth training programs, can effectively increase the opportunity cost of having a child at an early stage. If also these programs include soft skills training, this could directly impact their ability to plan and think about their future in a more serious and organized manner, becoming more optimistic about their future and realizing the importance of making adequate decisions today, which may reduce the practice of risky behaviors. In contexts of high pregnancy rates, focusing on providing soft skills and vocational training for young girls can have positive outcomes on pregnancy rates and therefore in educational attainment and labor market outcomes. In contexts where the female labor participation is limited, it would be worth promoting gender sensitive youth training programs tailored to the local context, focus on making non-stereotypical trades attractive to women and including placement and counseling services, in order to improve young women labor market outcomes.

In this sense, the findings of this paper reinforce the idea that there is a need for state intervention in the challenge of high teenage pregnancy rates. It is necessary to implement a comprehensive set of public policies that go beyond just giving information about planning methods. The policies should also have an impact on improving expectations about the future,

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[20] Policy interventions in the second category include school-based programs, extended school hours programs, Conditional Cash Transfer (CCT) programs, and youth training programs.

augmenting their self-esteem and other soft skills, especially for the poorest in the population.[21] Eventually, these policies would lead to better opportunities for women in the labor market, improved access to better quality jobs, and better earnings.

Even when there is a good idea of what policy option we have, it is necessary to increase the debate about which are the policy tools are the appropriate and cost-effective in order to decrease teenage pregnancy rates in Latin America and the Caribbean. Even though the primary goal of labor training programs is to improve the opportunities of finding a good job, they seem to have a role in reducing teenage pregnancy, even greater if they include training in soft skills. One question that remains is if this is the most effective way to go in order to reduce teenage pregnancy or if other policies should be designed, implemented and evaluated in the Region.

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[21] In the case of the Dominican Republic, an Inter-Agency Technical Committee for the Prevention of Teen Pregnancy presented the "Strategic Plan to Prevent Teen Pregnancy: Toward a National Policy". This plan is being implemented but has not been evaluated yet.

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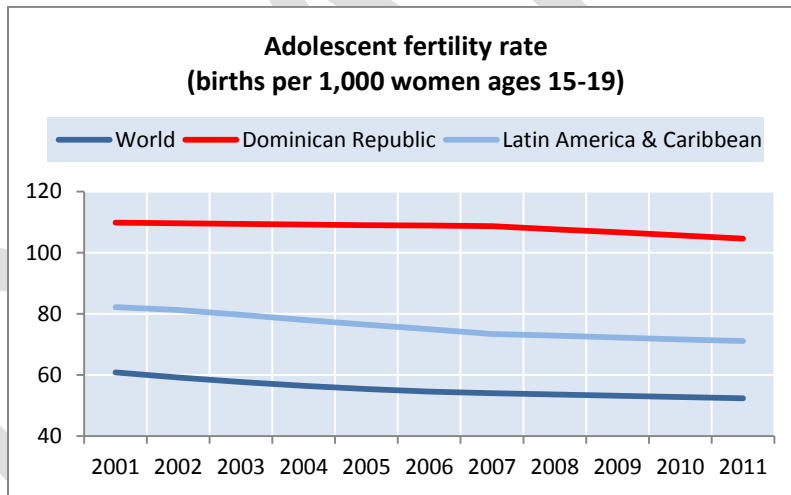
Annex I

Figure 1. Adolescent fertility rate
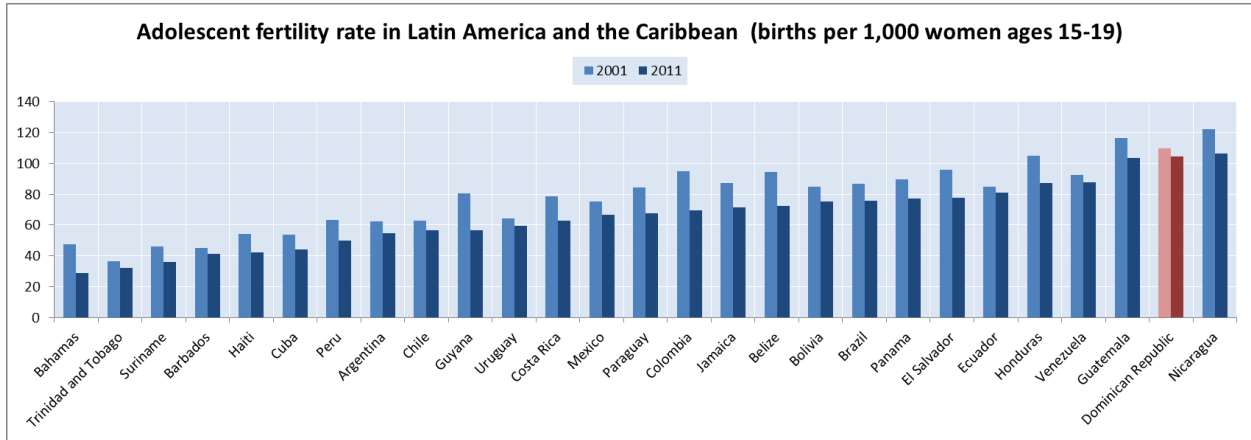
Source: World Development Indicators, 2001, 2011.

Figure 2. Comparison among the Dominican Republic, LAC and the world.

Source: World Development Indicators, 2001, 2011.

Table A.1: Balance of the sample of women

	Original randomization			Attrited				Complete Information			
	(1)	(2)		(3)	(4)		(5)	(6)	(7)		(8)
	Control	Treatment	t	Yes	No	t	DD	No	Yes	t	DD
Age	22.24	22.40	-1.21	22.19	22.38	-1.22	0.19	22.48	22.36	0.55	-0.47
Rosenberg's self-esteem score	23.72	23.91	-1.28	23.95	23.82	0.75	0.16	23.70	23.83	-0.37	0.30
Married	0.34	0.33	0.14	0.33	0.34	-0.26	0.06	0.33	0.34	-0.09	-0.01
Number of children	0.99	1.00	-0.28	0.94	1.01	-1.39	-0.03	1.01	1.01	0.00	-0.25*
Attend school	0.23	0.23	0.04	0.20	0.24	-2.01 **	-0.03	0.27	0.24	1.46	-0.03
Incomplete primary educ.	0.20	0.20	-0.17	0.23	0.20	1.68 *	0.01	0.18	0.20	-0.60	0.03
Complete primary educ.	0.06	0.05	0.70	0.05	0.05	-0.22	-0.00	0.07	0.05	1.71 *	-0.01
Incomplete secondary educ.	0.55	0.56	-0.60	0.51	0.56	-2.43 **	-0.02	0.55	0.57	-0.58	-0.01
Complete secondary educ.	0.03	0.04	-0.40	0.04	0.03	0.81	-0.01	0.02	0.04	-1.85 *	0.03
More than secondary educ.	0.00	0.00	-1.30	0.00	0.00	-0.22	0.01	0.01	0.00	1.76 *	-0.01*
Missing education	0.04	0.04	0.28	0.06	0.04	2.58 **	0.01	0.06	0.03	2.56 **	-0.01
No data on education	0.12	0.11	0.95	0.11	0.11	-0.25	-0.00	0.11	0.11	-0.37	-0.01
Number of jobs	0.19	0.19	-0.20	0.21	0.19	1.16	0.06	0.17	0.19	-0.91	-0.08
Employed	0.03	0.03	0.49	0.03	0.03	1.00	0.00	0.01	0.03	-1.22	-0.03
Salaried worker	0.02	0.01	1.52	0.01	0.01	-0.52	0.02	0.01	0.01	-0.75	-0.02
Unemployed	0.45	0.45	0.26	0.46	0.45	0.60	0.05	0.41	0.45	-1.27	0.07
Life Quality Index (0-100)	62.17	62.12	0.12	63.19	61.89	2.74 ***	0.33	63.64	61.67	3.01 ***	2.59*
Receives remittances	0.09	0.08	0.31	0.08	0.08	-0.30	0.01	0.12	0.08	2.12 **	0.04
Urban	0.91	0.90	0.71	0.93	0.90	2.70 ***	-0.04	0.92	0.89	1.55	-0.05
Lives in Santo Domingo	0.35	0.35	0.41	0.36	0.34	0.79	-0.04	0.46	0.33	4.60 ***	0.02
Observations	1080	2050		600	2530			303	2227		

Notes: This table shows baseline means for those in the control group (column 1); in the treatment group (column 2); attritors in the follow-up (column 3); non-attritors (column 4); non-attritors but with incomplete information in key variables (column 6); and, non-attritors with complete information (column 7). T-tests and significance levels for the mean difference between columns 1 and 2, 3 and 4, and 6 and 7 are also shown. To test for whether either attrition or having complete information on key variables differs across treatment and control groups, columns 5 and 8 respectively shows the difference-in-difference (DD) estimate: [T_(x=1) – T_(x=0)] – [C_(x=1) – C_(x=0)], where T and C stand for treated and control individuals, and x either for attrition or having complete information.*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.2: Balance of the sample of young women

	Original randomization			Attrited				Complete Information			
	(1)	(2)		(3)	(4)		(5)	(6)	(7)		(8)
	Control	Treatment	t	Yes	No	t	DD	No	Yes	t	DD
Age	18.38	18.44	-1.03	18.35	18.44	-1.26	0.01	18.55	18.42	1.49	-0.17
Rosenberg's self-esteem score	23.59	23.82	-0.81	24.13	23.64	1.43	0.60	23.40	23.66	-0.42	-0.73
Married	0.28	0.18	3.10 ***	0.22	0.22	0.15	-0.02	0.23	0.22	0.18	0.12
Number of children	0.38	0.29	2.09 **	0.31	0.33	-0.30	0.06	0.33	0.33	-0.05	0.09
Attend school	0.41	0.39	0.55	0.39	0.40	-0.32	-0.14	0.49	0.39	1.73 *	-0.13
Incomplete primary educ.	0.15	0.16	-0.18	0.20	0.14	1.78 *	0.02	0.10	0.15	-1.17	0.06
Complete primary educ.	0.05	0.03	1.16	0.04	0.04	0.10	0.03	0.04	0.04	-0.14	0.07
Incomplete secondary educ.	0.55	0.63	-2.20 **	0.52	0.62	-2.36 **	-0.08	0.69	0.62	1.25	-0.24**
Complete secondary educ.	0.04	0.04	0.42	0.04	0.04	0.10	-0.06	0.01	0.04	-1.35	-0.05
More than secondary educ.	0.00	0.00	-0.75	0.00	0.00	-0.51	0.00	0.00	0.00	-0.38	0.00
Missing education	0.05	0.03	1.09	0.07	0.03	2.11 **	0.02	0.03	0.03	-0.33	0.04
No data on education	0.15	0.10	1.98 **	0.13	0.12	0.24	0.06	0.14	0.12	0.53	0.11
Number of jobs	0.14	0.17	-0.93	0.19	0.16	1.01	0.13*	0.19	0.15	0.72	-0.19*
Employed	0.02	0.02	0.12	0.02	0.01	0.57	-0.04	0.00	0.02	-1.06	-0.01
Salaried worker	0.01	0.01	0.25	0.00	0.01	-1.13	-0.00	0.00	0.01	-0.84	-0.00
Unemployed	0.44	0.45	-0.15	0.46	0.44	0.27	0.11	0.39	0.45	-0.92	-0.01
Life Quality Index (0-100)	63.87	64.08	-0.31	64.72	63.83	1.08	1.21	64.43	63.75	0.61	2.24
Receives remittances	0.07	0.11	-1.92 *	0.08	0.10	-0.53	0.02	0.13	0.09	0.87	-0.06
Urban	0.93	0.91	0.82	0.94	0.91	1.18	0.03	0.98	0.90	2.14 **	-0.06
Lives in Santo Domingo	0.38	0.39	-0.42	0.40	0.39	0.29	-0.05	0.53	0.37	2.76 ***	-0.10
Observations	291	519		166	644			80	564		

Notes: This table shows baseline means for those in the control group (column 1); in the treatment group (column 2); attritors in the follow-up (column 3); non-attritors (column 4); non-attritors but with incomplete information in key variables (column 6); and, non-attritors with complete information (column 7). T-tests and significance levels for the mean difference between columns 1 and 2, 3 and 4, and 6 and 7 are also shown. To test for whether either attrition or having complete information on key variables differs across treatment and control groups, columns 5 and 8 respectively shows the difference-in-difference (DD) estimate: $[T_{(x=1)} - T_{(x=0)}] - [C_{(x=1)} - C_{(x=0)}]$, where T and C stand for treated and control individuals, and x either for attrition or having complete information.*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.3: Overall JE effects on pregnancy (Probit, marginal effects)

Intention to Treat Effects	(1)	(2)	(3)
	All	Age	Age
Pregnancy	women	16-19	20-30
Treatment	-0.0268	-0.0783*	-0.0090
	(0.0205)	(0.0414)	(0.0240)
Mean dep. var for control group	0.350	0.389	0.337
Observations	2,227	564	1,663

Note: robusted standard errors clustered at the course level in parentheses.
*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Table A.4: JE effects on channels (male sample)

Intention to Treat Effects	(1)	(2)	(3)	(4)
	Total CPS score	Rosenberg scale	Total Grit scale	Expectations index
Treatment	0.2180**	0.1891*	0.0903	0.0861
	(0.1052)	(0.1060)	(0.1045)	(0.0930)
Mean dep. var for control group	-0.0540	-0.159	0.0148	-0.139
Observations	440	440	440	440

Note: Robust standard errors clustered at the course level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: JE effects on motherhood and parenthood

	(1)	(2)	(3)
	All	Age	Age
Is newborn's mother the JE beneficiary?	women	16-19	20-30
Treatment	-0.0066	-0.0425	0.0060
	(0.0204)	(0.0391)	(0.0241)
Mean dep. var for control group	0.283	0.306	0.276
Observations	2,227	564	1,663
	(1)	(2)	(3)
		Age	Age
	All men	16-19	20-30
Is newborn's father the JE beneficiary?			
Treatment	-0.0010	0.0051	-0.0048
	(0.0192)	(0.0268)	(0.0248)
Mean dep. var for control group	0.110	0.0679	0.132
Observations	1,329	440	889

Table A.6: JE effects on motherhood and parenthood (number of newborns)

Number of new children of female JE beneficiary	(1) All women	(2) Age 16-19	(3) Age 20-30
Treatment	-0.0183	-0.0265	-0.0153
	(0.0248)	(0.0459)	(0.0298)
Mean dep. var for control group	0.318	0.321	0.317
Observations	2,227	564	1,663

Number of new children of male JE beneficiary	(1) All men	(2) Age 16-19	(3) Age 20-30
Treatment	0.0140	0.0279	0.0058
	(0.0248)	(0.0372)	(0.0315)
Mean dep. var for control group	0.123	0.0741	0.149
Observations	1,329	440	889