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Evolution of adolescent fertility after decriminalization of abortion in Montevideo, Uruguay



José-Ignacio Antón^a, Zuleika Ferre^b, Patricia Triunfo^{b,*}

^a Department of Economics, Johannes Kepler University, Linz, Austria

^b Department of Economics, University of the Republic, Montevideo, Uruguay

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ABSTRACT

Objective: To analyze the effect on adolescent fertility in Montevideo of the Uruguayan law on the voluntary termination of pregnancy that was passed in 2012. **Methods:** The change in the number of births to teenage mothers between 2010 and 2014 was analyzed, along with their characteristics before and after decriminalization of abortion. **Results:** Descriptive analysis of abortion before and after decriminalization showed that there was no reduction, during the period analyzed, in adolescent fertility, nor any changes in the distribution of births. **Conclusion:** The normative change brought about by the law on the voluntary termination of pregnancy was not associated with any substantial change in the reproductive behavior of adolescents in Montevideo. We recommend that this analysis is taken further with impact evaluation methodologies.

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1. Introduction

The adolescent fertility phenomenon started to become significant in Uruguay from the 1990s onward, with a 33% growth in fertility among teenagers aged 15–19 years and a 66% growth among girls aged 10–14 years between 1963 and 1996. During the same period, fertility declined steadily in women aged 20–29 years, thereby increasing the contribution of adolescents to the total fertility rate. Since then, adolescent fertility has shown an atypical behavior when compared with general fertility. While the number of children per woman has been falling steadily for several decades, reproduction in teenage years has shown a fluctuating behavior and a strong resistance to any decrease [1–3]. In 2013, 8000 births to mothers aged 15–19 years were recorded. This means that 61 out of every 1000 adolescents were mothers during that year. Although this figure is less than that for 1996 (71 per 1000), it is still significantly above the figure recorded in 1963 (53 per 1000).

The literature has analyzed the impact of abortion on normative changes, such as decriminalization, liberalization, or even its prohibition from several viewpoints using both quantity (variations in the fertility levels) and quality variables (health indicators in newborns or characteristics of their mothers). However, most of the empirical evidence available is focused on the USA due to the data's quality and the variation in the legislation between states, which makes it easier to identify causative effects. A large number of articles have also been published that study the effects in European countries. Most studies find that liberalizing restrictive laws on abortion has negative effects on the

number of total births, with more marked effects in adolescents [4–12]. However, it is not clear that there is a non-random effect in births with certain characteristics, depending on the indicators taken into consideration [13–18].

The present paper provides a descriptive analysis of the evolution of adolescent fertility and the characteristics of the neonates and prenatal care, before and after enactment of Voluntary Termination of Pregnancy (VTP) Law 18.987. The VTP Law was approved on October 22, 2012, published on October 30, 2012, regulated by Decree No. 375/012 on November 22, 2012, and came into force on December 3, 2012, in Uruguay.

2. Materials and methods

Using data from the Perinatal Information System (PIS) [19], the evolution of births to mothers under 20 years old was analyzed. The PIS database has certain unique features in that it provides precise time and space information that includes data about the mother, her pregnancy, and the newborn. The PIS was created with the goal of monitoring maternal, perinatal, and infant health in Latin America and the Caribbean, using forms in clinical use in obstetrics and neonatology that are completed by a health professional and then entered into the PIS.

Upon comparing the records with the Live Birth Certificates (LBC), which are registered universally in Uruguay, it can be seen that the PIS's coverage is increasing systematically, especially in the country's hinterland, due to improved reporting by the centers that were already complying with this system and the inclusion of a number of hospitals. Consequently, for the present paper, we chose to analyze births in Montevideo at the 15 largest health centers (public and private) for

* Corresponding author at: Constituyente 1502, Montevideo, Uruguay CP 11200. Tel.: + 598 2 4106449.

E-mail address: patricia.triunfo@cienciassociales.edu.uy (P. Triunfo).

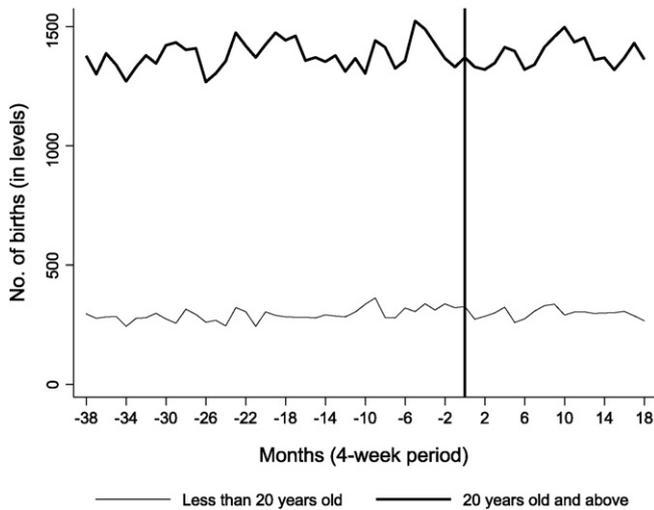


Fig. 1. Evolution of births to women younger and older than 20 years of age in Montevideo, Uruguay, before and after reform of the Voluntary Termination of Pregnancy law in 2012.

which the PIS provided universal coverage during the analysis period. These births represent 92% of all births in Montevideo and 51% in the country as a whole. Although historically Montevideo has had fertility rates below the national average, there has been an upward trend in fertility during the last five years.

In order to consider the years before and after the regulatory change regarding VTP, births to adolescents in Montevideo between 2010 and 2014 were considered, with 2014 being the most recent year with available data.

The date of interest is that marking women’s transition from being eligible to non-eligible for consideration under the VTP law; for example, the date at which they completed 12 weeks of pregnancy. However, as the weeks of pregnancy may be coded with a certain level of error (due to problems with the recording unit e.g. weeks/days, or errors in calculating the number of weeks of pregnancy) and the treatment received by the women who were at the limit of the 12-week period was not known, we decided to use the date at which the pregnant women reached 13 weeks of pregnancy, which would render them ineligible under the law.

Therefore, the final database used in the analysis included births to mothers under 20 years of age who reached the 13th week of pregnancy between January 1, 2010, and June 11, 2014. This last date avoids underestimating the number of births by not including the women who were pregnant during 2014 who gave birth in 2015 for whom the database is not available.

To observe changes in the characteristics of the neonates, weight at birth (g), low birth weight (<2500 g), and prematurity (<37 weeks) were defined, together with two indicators of the adequacy of prenatal care during pregnancy. The first indicator, based on the Kessner Index [20], establishes that a woman receives adequate care if she has her first appointment during the first trimester (early enrollment) and at least nine appointments by term, or between four and eight appointments if the birth is pre-term. A second category is based on the Ministry of Public Health’s 2010 guidelines, which consider that care is adequate if the woman starts prenatal care during the first trimester and has had at least six appointments by the time of birth.

The evolution of the number of births to adolescents and women aged 20 years or more was evaluated week-by-week from June 1, 2010, to June 11, 2014, and is shown in a graph that gives the number of births occurring each week during the entire study period, before and after the date that the VTP law came into force (which was taken as time 0). In addition, the average number of births per week was calculated with its standard deviation, also comparing the period before and after implementation of the law. We analyzed whether there

were any significant changes between the period before and after the effective date of decriminalization—excluding the 13 weeks immediately after this date—using a contrast of means (without assuming equality of variances) between the average number of births per week before and after the reform. Specifically, the null hypothesis was that the number of births per week before the reform was equal to after the reform and the alternative hypothesis was that the number of births was higher before the law than after it.

Likewise, the average values for weight at birth, low weight at birth, prematurity, and the percentage of women receiving adequate prenatal care during the period before and after application of the law were compared. For the number of births, a contrast of means of the observations before and after the reform was used, without assuming equality of variances, and a contrast of proportions for binary variables. In this case, the null hypothesis was the equality of means and proportions, as it is not possible to know *a priori* the direction of a given selection of births.

As this was a secondary analysis of databases there were no ethical implications. Stata13 (StataCorp LP, College Station, TX, USA) was used to carry out the analysis.

3. Results

Fig. 1 provides an initial descriptive representation of the evolution of births before and after reform of the VTP law, indicating that there were no relevant effects on teenage fertility.

Table 1 shows the average and the standard deviation of weekly births before and after the reform. The average number of births per week to mothers younger than 20 years of age did not show any statistically significant changes when the periods before and after the VTP law were compared.

Regarding birth characteristics, the tests for equality of means before and after the reform suggest that there was some improvement in several outcomes: birth weight becomes higher (at less than 1% significance level), prevalence of low weight decreases (at 10% significance level), and the probability of receiving adequate prenatal care increases (at less than 1% significance level). The proportion of premature infants does not show any statistically significant change at the 10% significance level (Table 2).

4. Discussion

The descriptive analysis performed using data from the PIS for births that occurred between 2010 and 2014 in Montevideo shows that the VTP law in Uruguay had no impact on the number of births to teenage mothers. Although there are some statistically significant variations in the weight of the neonates, these variations lack any clinical significance and it is impossible to give any interpretation to these results that could associate them causatively with the reform that decriminalized abortion in Uruguay. Accordingly, an impact evaluation should be performed that applies a strict identification strategy, including an analysis of other age groups, which was outside of the scope and objective of the present paper.

Table 1
Births per week before liberalization of the abortion law (2010–2012) and after the reform (2013–2014).

	Before reform, mean ± SD	After reform, mean ± SD	
Number of births per week to mothers younger than 20 years of age	73.0 ± 11.2	74.6 ± 8.9	
			Test of equality of means
Mean difference test (before vs after) (null hypothesis: $N_{after} - N_{before} = 0$; alternative hypothesis: $N_{after} - N_{before} < 0$)			Difference 1.571
			t statistic 1.19
			P value 0.883

Table 2
Characteristics of newborns and prenatal care, before and after liberalization of abortion in Uruguay, for children born to mothers younger than 20 years of age.

	Before reform, mean ± SD	After reform, mean ± SD	Mean difference test (null hypothesis: equality of means or proportions between before and after; alternative hypothesis: inequality of means or proportions)		
			Difference (after–before)	t statistic (means)/z-statistic (proportions)	P value
Birth weight, g	3147.0 ± 609.0	3179.0 ± 585.8	32.015	3.18	0.002
Probability of low birth weight (<2500 g)	0.11 ± 0.31	0.10 ± 0.30	–0.010	–1.91	0.056
Prematurity (<37 weeks of pregnancy)	0.12 ± 0.32	0.11 ± 0.31	–0.006	–1.13	0.259
Adequacy of prenatal care (Kessner)	0.35 ± 0.48	0.44 ± 0.50	0.088	10.40	>0.001
Adequacy of prenatal care (Ministry of Public Health)	0.50 ± 0.50	0.58 ± 0.49	0.086	9.88	>0.001

Historically, most societies have regulated fertility through a combination of contraceptive methods and abortion practices (in some cases, there have been restrictions on marriage or the age of sexual debut). Using different types of theoretical models, the literature has sought to determine whether the changes made to the policies that regulate abortion affect women's reproductive behavior, specifically through the observation of pregnancies, abortions, and births. Policy changes may have ambiguous impacts on the number of births, as it will depend on how a woman responds to the pregnancy and the abortion; the impact itself is related to the gradualness with which the measures are implemented. Most studies, performed in the USA, found a negative impact on fertility when restrictive abortion policies were liberalized.

The social, political, and health context in Uruguay in 2012 was very different from that of the 1970s in the USA. First, although abortion was illegal in Uruguay until 2012, the actions undertaken by the group *Iniciativas Sanitarias* from 2002 onward regarding the provision of information by health personnel about safe pregnancy termination practices, performance of health checks, the offering of medical, psychological, and social counseling to women who were considering abortion as an alternative, probably had an impact on Uruguayan society and, therefore, on women's decisions regarding their reproduction [21,22]. Second, the technological changes that the procedure has undergone in recent years have meant that nowadays most abortions are medical and not surgical. It is estimated that, at least until 2002, 80% of the voluntary abortions were carried out using surgical procedures [23]. Some studies have shown that the growth of the illegal misoprostol market since 2002 pushed out the traditional clandestine clinics that carried out surgical abortions. Women quickly showed their preference for medical abortion, which was safer and cheaper [24]. All of this leads us to think that access to abortion was better during the early 2000s than in the 1990s. Finally, contraceptive methods are widely known and available in Uruguay (including the morning-after pill) and this must also be taken into account when evaluating the impact of the law on reproductive decisions.

These unique conditions in Uruguay in previous years may explain why approval and implementation of the VTP law did not lead to a substantial change in the reproductive behavior of adolescents in Montevideo. The first years of application of the law show that the number of abortions is much less than prior estimates. Between December 2012 and December 2014, 15176 VTPs (18% in women under 20) were carried out, 40% in public institutions and 62% in Montevideo [25]. Therefore, in 2014 Uruguay had an abortion rate of 12 per 1000 women in the 15–44 years age group. This figure is similar to Portugal (9 per 1000), Italy (10 per 1000), or Spain (12 per 1000), and quite a lot less than other countries in the region such as Cuba (29 per 1000) [26].

Among the main conclusions that can be drawn from this study for national public policymakers, it is very possible that the absence of any impact on decreasing adolescent fertility in the immediate term is not due to a change in reproductive behavior (increase in the number of abortions), but to a change in the framework in which they are carried out (illegal versus legal). In this sense, one should expect an improvement in medical safety, which is vital for the stage of life of the women analyzed, and also a financial saving, as this medical intervention is now included in the services provided by the health system.

This study is not without limitations. The first is that because data are not available for the entire country, which forced us to limit the analysis to the capital, we cannot say whether the results would be the same if the whole country or other age groups were to be considered. Second, this evaluation is limited to the immediate impact of the legislative change and it will not be possible to evaluate the longer-term impact until later on. Third, the existence of other changes concurrently with the VTP law, such as the reform of the Uruguayan health system which began in 2008, may possibly have a confounding effect on the results. This reform broadened the coverage and freedom in the choice of provider, a fact that particularly affected adolescents, increasing private coverage, among other things. However, we do not believe that any of these factors invalidate this study's main conclusion, namely, that the legislative change did not alter the fertility of adolescents in Montevideo during the 1.5 years following the change in the law. To conclude, in further studies, other age groups should be studied and methodologies should be used with strong identification strategies that enable the direction of the causalities to be determined. This in turn could be strengthened with external control groups, for example, having the PIS database for Argentina.

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Conflict of interest

The authors have no conflicts of interest.

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