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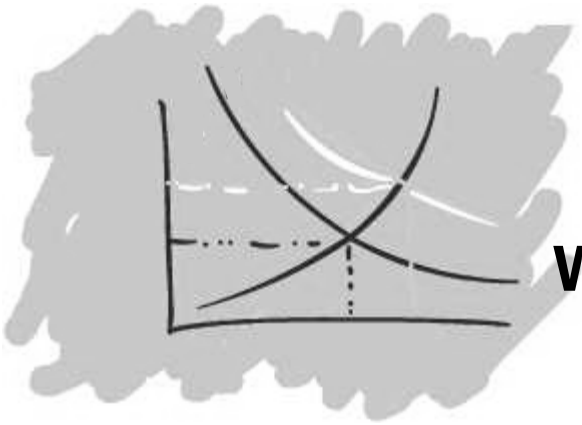

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SOCIO-ECONOMIC DETERMINANTS OF ABORTION RATES

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SOCIO-ECONOMIC DETERMINANTS OF ABORTION RATES

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Abstract:

Abortion rates are increasing all around the world, especially for young women. Our proposals for public policies to reduce unwanted pregnancies are based on an analysis of the socio-economic determinants of abortion rates. Special attention is paid to regional levels of alcohol consumption, living conditions, and public spending on health and education. We carry out estimations using data on regions in Spain from 1999 to 2004. There is empirical evidence that socioeconomic conditions, lifestyles and regional characteristics determine regional abortion rates. Our results suggest that it is important to design public policies to reduce alcohol abuse, improve citizens' working conditions and promote gender equality through government subsidized childcare.

Keywords: abortion rates, unplanned pregnancy, public policies.

JEL codes: I12, I18, J13.

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1. INTRODUCTION

Around the world there is growing concern about rising abortion rates, especially for young women. The World Health Organization considers teenage pregnancy a high-risk sexual behaviour because of its important implications for health and social welfare. The majority of young women who reach the difficult decision to terminate a pregnancy have not finished their studies or have just started their first job. Becoming mothers would reduce the amount of time and energy they could devote to pursuing academic and career goals. Moreover, as adolescents are generally ill-equipped to assume the responsibilities of parenthood, it is no surprise that they are pressured into seeking abortions (Coleman, 2006).

Russia was the first country to legalise abortion, in 1920. Nowadays, around 60% of the world's population lives in countries where induced abortion is legal. In contrast, another 25% live in countries that strictly forbid it or allow induced termination of pregnancy only in cases where the pregnancy poses a threat to the mother's life (Boland and Katzive, 2008). Although many countries have liberalized their laws, the voluntarily interruption of pregnancy remains subject to a number of restrictions, which do not have a deterrent effect. In many developing countries where abortion services are restricted by law, access to safe abortions appears to be increasing, especially among the middle class. Many poor women seek clandestine abortions that impose heavy economic and health burdens on them (Singh et al., 2009).

The legalization of abortion in the USA in the 70's has not only improved women's health but has also had a positive effect on the college graduation rate for women and reduced the odds of women becoming single mothers (Oltmans-Ananat et al., 2009). Abortion is a solution for an unwanted pregnancy, but as with any solution, it comes with its own set of problems. Abortion in young women may be associated with greater risks of mental illness (Fergusson, Horwood and Ridder, 2006). For example, post-traumatic stress and social anxiety, not usually associated with the birth of one's first born, are experienced following an abortion. This causality has been largely explained by pre-pregnancy mental health disorders and their association with higher rates of violence (Steinberg and Russo, 2008).

Abortion was made legal in Spain in 1985 (Law 9/1985). There are three medical indications for which abortion is permitted: rape (within 12 weeks of conception), fetal anomalies (within 14 weeks) and medical illness in which continuation of the pregnancy poses a threat to the life or health of the pregnant woman (no time limit). In Spain, there are 110,000 elective induced abortions a year, which represents an average rate of approximately 1 abortion for every 100 women of childbearing age. The main reason given for the decision to abort is that the pregnancy is a health risk for the mother (97%). Risk to the fetus is cited in a mere 3% of abortion cases.

For many years, a large segment of Spanish society has been demanding legal reforms. Proponents argue that 14 weeks is not always enough time for discovering a congenital malformation and that the concept of serious health risk is so vaguely defined that women and doctors are always under suspicion of having committed a crime. In fact, as only 3% of abortions are performed in public hospitals, private clinics are overwhelmingly responsible for providing elective induced abortions. In addition, harmonization of the laws of countries belonging to the European Union would lengthen the time period in which a woman might abort legally. Countries with more flexible laws, such as Holland, Belgium and Germany, have the lowest abortion rates. In developing countries in Europe, such as the newly admitted member Albania, the drop in the fertility rate over the last 50 years has occurred in the absence of modern contraception and abortion policies. The fertility rate has decreased as a result of the broad investments in social strategies during the communist regime which had indirect effects on the fertility rate. This example illustrates that education policies, and in particular those directed at girls and women, are effective instruments for reducing abortion rates (Gjonca et al., 2008).

The Spanish fecundity rate has been decreasing gradually since 1976. The abortion rate had remained stable at around 50% of the fecundity rate until 1997, when the abortion rate shot up. In 2006, both rates had the same magnitude. (*Insert Graph 1*)

Near 40% of the voluntary interruptions of pregnancy are performed on women younger than 25 years old. The number of induced abortions has been on the rise for all age groups; however, the increase is most pronounced for young women. In fact, while

the annual number of teenage mothers remains stable (over 11,000 per year), the annual abortion rate among adolescents increases (Del Rey, 2005). (*Insert Graph 2*)

Young women usually delay contacting abortion clinics until far into their pregnancies. The most common reason for seeking an abortion is the desire to put off motherhood. The prospect of improving one's life before becoming a mother is a strong argument for waiting for a better time (Rowe et al., 2009; Santelli et al., 2009). An unplanned pregnancy is usually associated with other kinds of problems such as being unemployed, not being married, having a low educational level, consuming alcohol or being obese (Raatikainen et al., 2006). Most abortions might have been avoided had some method of family planning been used. Although no birth control method is 100% effective (apart from sexual abstinence), risky sexual behaviours, such as the non-use or misuse of birth control methods are certainly important determinants of unplanned pregnancy. The probability of engaging in unprotected sex or having multiple sexual partners is greater for unemployed females, young girls who do not attend school, and women who have not received any sexual or reproductive health education. Similar patterns can be observed around the world but are especially pernicious for underdeveloped countries where social services are lacking or inexistent. (Babela et al., 2008).

The costs associated with public policies make it imperative that strategies are designed to be as cost-effective as possible. If, for example, people who are under the influence of alcohol lose their inhibitions, a cost-effective policy to increase the price of alcoholic beverages via a special indirect tax could reduce their demand for alcohol. A review of the literature reveals a strong correlation between alcohol consumption and risky sexual behaviours. The connection is evident, although many questions about the exact nature of the relationship remain unanswered. Some authors contend the positive association between alcohol consumption and the probability of engaging in sexual intercourse can be explained mainly by unobserved heterogeneity (Sen, 2002). For others, there is no defined causal impact (Grossman and Markowitz, 2005; Rees et al. 2001). Similarly, according to some authors alcohol consumption decreases the use of birth control methods (Grossman and Markowitz, 2005), while for others this relationship is not so clear (Rees et al., 2001). Even during pregnancy, alcohol

consumption has been shown to be significantly associated with smoking and sleeping less, whereas abstinence was significantly associated with sexual-health knowledge (Yamamoto et al., 2008). Alcohol and drug abuse are also correlated with increased odds of undergoing more than one abortion (Prager et al., 2007).

The main aim of this study is to analyze abortion rates and their determinants. In particular, we study the effectiveness of diverse economic policies and living conditions in lowering abortion rates. Apart from providing important empirical evidence on Spain, this study is unique in that it seeks to provide theoretical models for abortion rates from an economic perspective that explains the occurrence of negative events resulting from risky behaviours.

2. THEORETICAL FRAMEWORK

The theoretical framework combines elements of economic and psycho-social theories for constructing a model for regional abortion rates. These theories help us to organize the basic structural relationship among variables and to select the best proxies.

Just as it is not wrong to model the joint decisions of drinking and driving under an economics framework of rational choice theory, the decision to engage in sex while under the influence of alcohol might be less spontaneous than first thought. In fact, there is strong empirical evidence demonstrating a positive link between alcohol consumption and risky sexual behaviours. A study on the perceptions of contraception, the decision not to use protection and induced abortion among a sample of urban teenage girls identifies alcohol consumption as one of the most cited determinants of risky sexual behaviours (Thorsen et al., 2006). The failure of contraceptive methods used while under the influence of alcohol is frequent and even accepted as normal (Ekstrand et al., 2007).

Given this positive association, reducing alcohol consumption might help to reduce other risky behaviours such as having traffic accidents or engaging in unprotected sex. In fact, most governments frequently recur to increasing alcohol taxes.

Alcohol taxes increase prices paid by consumers, and consequently, the demand for alcoholic beverages falls (Young and Bielinska-Kwapisz, 2006).

The costs that alcohol drinkers incur and impose on the people who surround them are the main reason why alcoholic beverages carry a special indirect tax. Indirect taxes are usually transferred in whole to the final price of the product, so consumers experience a price increase. Governments justify price increases as a means of making consumers aware of the real costs of consuming alcoholic beverages (the price of the product plus the cost of all the negative consequences of alcohol abuse, such as health problems or social conflict). Young people place less importance on the possible future non-monetary costs because they have less money than adults (Grossman et al., 1993). This perceived difference means that if the final price of alcoholic beverages increases, the consequences will be greater for youth.

The application of a specific alcohol tax is the most commonly implemented measure for reducing alcohol abuse. However, it is not the only one. An important predictor of alcohol consumption in adulthood is the age at which an individual begins drinking alcoholic beverages. Thus, governments across the globe have implemented policies to raise the minimum legal age for purchasing alcoholic beverages with the hope of delaying the age at which individuals initiate drinking alcohol (Cook and Tauchen, 1984).

Although alcohol abuse is a significant determinant, there are others that are even more important. Focusing solely on alcohol policies is not enough. However there is no evidence that the provision of family planning services either reduces conception or abortion rates (Paton, 2002).

As regards socioeconomic background, women with low socioeconomic status have many more unplanned pregnancies than better educated women. Except for young or unmarried women, the lower the woman's socio-economic status, the greater is the likelihood she will choose to have an induced abortion when faced with an unplanned pregnancy. However, teenage fertility rates vary greatly among districts with different average income levels. For example, most pregnancies that end in births are unplanned for women from disadvantaged social classes (Cano-Serral et al., 2006; Font-Ribera et

al., 2008; Valero et al., 1994). In addition, the use of contraceptive methods is less frequent among women with fewer financial resources.

Without detracting from the significance of socioeconomic status, other studies that point to partner cohabitation as the strongest determinant of planned pregnancy (Besculides and Laraque, 2004) are worth mentioning. Furthermore, in Barcelona, few women carry their pregnancy to term in the absence of a "steady" partner. This tendency is contrary to what happens in northern European countries where the rate of single mothers is much higher due to both women's liberation and access to better social benefits (Zeitlin, et al., 2002).

Reality is even more complex. The association between education levels and abortion decisions varies greatly depending on age and partner cohabitation (Salvini and Schifini, 1996, Sihvo et al., 2003). Young women with high educational levels end their pregnancies more frequently by induced abortion, but this association disappears for older women (Font-Ribera et al., 2008). Once controlled for age, these results are similar to those obtained on Sweden. The motives for postponing and limiting the number of children reflect the desire to have children with the right partner at the right time in order to combine good parenting with a professional career. Prevailing expectations about lifestyle render abortion a necessary family planning alternative (Kero et al., 2001). The link between education and abortion helps us to understand why, in the case of the Barcelona sample, socio-economic inequalities in pregnancy results are strong for women living with their partners, but have no impact or even play a reverse role for single women.

Women in disadvantaged socioeconomic conditions who do not live with their partners are more likely to carry their pregnancy to term, especially when they are young. Their reasons for continuing with the pregnancy include the difficulties encountered in obtaining abortion services or their accepting economic struggles as an additional problem but not as a restraint (Smith, 1993). Abortion is not only positively correlated with the teenagers' academic performance and educational expectations, but also with the teenagers' mother's level of educational attainment (Zavodny, 2001).

After reviewing the available literature summarized above, we define a theoretical model for abortion rates by extrapolating the model provided in the article by Arranz and Gil (2009) for the rate of traffic accidents. In each case, traffic accidents and abortions are the negative consequences of risky behaviours and exhibit certain probabilities of occurring. Regional abortions rates (A) in a given year t depend on the regional rates of unplanned pregnancy (U), abortion law (L) and a vector that includes socio-economic characteristics (D):

$$A_t = A(U_t, L_t, D_t) \tag{1}$$

The main problem with equation (1) is that U is not observable, since there is no data available on unplanned pregnancies. To solve the maximization problem, we concentrate our attention on the pattern that defines risky sexual behaviours, as they are important determinants of unplanned pregnancy. The function that explains the regional rate of unplanned pregnancy includes alcohol consumption (C), public policies to prevent risky sexual behaviours (PuS) and the cost of a sexually transmitted disease (STDs) or an unwanted pregnancy (S):

$$U_t = U(C_t, PuS_t, S_t) \tag{2}$$

We just substitute the U expression in (1)

$$A_t = A(C_t, PuS_t, S_t, L_t, D_t) \tag{3}$$

Lastly, the demand for alcoholic beverages might be determined by the prices of alcoholic beverages (PA), socio-economic characteristics (D) and public policies to prevent alcohol abuse (PuA). If we substitute alcohol consumption in the equation for abortion rate with the expression for its demand, we obtain:

$$A_t = A(PA_t, PuA_t, PuS_t, S_t, L_t, D_t) \tag{4}$$

3. DATA BASE AND EMPIRICAL MODEL

The empirical estimation for Spain spans from 1999 to 2005. In fact, our source of variation includes time and location as information was gathered on 17 Autonomous Communities for 7 years (119 observations).

We prepared our own database with information extracted from the Consumer Survey of Households (Spanish Ministry of Food, Agriculture and Fishing); Abortion Statistics (Spanish Ministry of Health and Consumer Affairs); Annual Labour Statistics (Spanish Ministry of Labour and Immigration), Social Indicators (Spanish National Institute of Statistics), Spanish National Accounts (Spanish National Institute of Statistics), Social Protection (Spanish Ministry of Labour and Immigration) and Official Regional Gazettes. (*Insert Table 1*)

Table 3 contains the mean and standard deviation of the variables, which have been classified by information sources. In order to compare magnitudes, we consider most variables in relative terms (except for alcohol policies), because population size varies considerably among regions.

The average abortion rate is nearly 7 per 1000 women of childbearing age. Five percent of women of childbearing age are not Spanish nationals. Approximately 20% of citizens have attended college. The average per capita wage is 17,496 Euros per year, and 58% and 25% of men and women are employed, respectively. The minimum legal age for buying alcoholic beverages has risen from 16 to 18 years in all of the Autonomous Communities in Spain. Because the Autonomous Communities are self-governed, each regional government is responsible for setting its own minimum drinking age. As a result, legislation establishing a minimum age of 18 has been passed at different times in the different Autonomous Communities. In fact, Catalonia and Navarre were the first regions to adopt this policy in 1991, whereas Asturias was the last one to do so, in 2006. Figures reveal that on average an individual consumes 32 litres of alcoholic beverages per year (19 litres of wine, 12 litres of beer and 1 litre of spirits). With respect to policies that determine sexual and reproductive health and family planning, there are nearly 802 doctors and nurses for every 100,000 individuals and 3% of babies 36 months old and younger attend childcares that receive state

funding. Lastly, because information on the costs of STDs or unwanted pregnancy is unavailable, we consider the regional prevalence of AIDS, syphilis and gonorrhoea as a proxy. There are 5 new cases of AIDS, 2 new cases of syphilis and 27 new cases of gonorrhoea for every 100,000 individuals per year. Suffering from an STD represents a problem in and of itself, as does an unwanted pregnancy. Considering STDs directly, instead of their costs, creates the same problems for the estimations as does considering the alcohol consumption.

The abortion law has not undergone any major reforms since it was enacted in 1985. As a consequence, the variable (L) acts as a constant in our model, and therefore, does not further our understanding of how changes in an abortion law might affect abortion patterns.

The equation for abortion rates takes the following form:

$$A_{it} = C_{it}\gamma_1 + PuS_{it}\lambda_1 + S_{it}\beta_1 + D_{it}\phi_1 + u_{1it} \qquad \text{i=1,2,…17; t=1999,…2005} \qquad (5)$$

and alternatively:

$$A_{it} = PA_{it}\alpha_2 + PuA_{it}\gamma_2 + PuS_{it}\lambda_2 + S_{it}\beta_2 + D_{it}\phi_2 + u_{2it} \quad \text{i=1,2,…17;t=1999,…2005} \qquad (6)$$

where the dependent variables A_{it} summarizes the abortion rate for the Autonomous Community *i* for the year *t*; the matrix of explicative variables C_{it}, PA_{it}, PuA_{it}, PuS_{it}, S_{it} and D_{it} provide information about regional alcohol consumption, prices of the alcoholic beverages, public policies to prevent alcohol abuse and risky sexual behaviours, the prevalence of sexually transmitted diseases and socio-economic characteristics; α, γ, λ, β and ϕ are vectors of parameters; u_{it} are residuals which summarize unobserved factors that influence abortion rates, such as environmental problems or religious attitudes, among others.

The most common specification of the dependent variable A_{it} in the equation for the abortion rate (5) consists in a logistic transformation of this variable. That is, if a_{it} is obtained for the Autonomous Community *i* is the number of abortions divided by the regional population for each year *t*, then the dependent variable in the regression is

$A_{it} = (a_{it}/(1-a_{it}))$, which we consider to be logarithmic. One advantage of this transformation lies in limiting the range of possible values for the abortion rate to 0 to 1.

We also assume that unobservable factors that influence abortion rates may be unique to each Autonomous Community and constant over time. Additionally, there may also be specific unobservable factors for each year. Thus the residual in equations (5) and (6) should be transcribed as $u_{it} = \varphi_i + \lambda_t + \varepsilon_{it}$; where φ_i represents the unobservable fixed effects for each Autonomous Community, λ_t the fixed effects for each year and ε_{it} the error term which has a constant variance and is not correlated with observable and unobservable characteristics for the Autonomous Communities through time. The specific unobservable fixed effects for each region and year are summarized as dummy variables for each region and year.

Application of the estimation method requires that certain distinctions be taken into account. We estimate equations (5) and (6) by applying Ordinary Least Squares (OLSQ), thus the right hand of the equations contains only exogenous variables and additionally these variables are not correlated with the residuals, thereby satisfying all the assumptions of the classic OLSQ. However, OLSQ may be implemented only if alcohol consumption and the prevalence of STDs are not correlated with the residuals. We checked for correlation using Augmented Test Regression. Tests fail to reject the null hypothesis of exogeneity, thus alcohol consumption and STDs are exogenous variables. Just as the variables alcohol consumption and the prevalence of STDs are correlated with the residual, the OLS estimators might be inconsistent and asymptotically inefficient. Although care must be taken when analyzing the estimated coefficients, their occasional introduction might be useful to check how robust the results are. Lastly, due to the small number of observations (119 observations in 17 Autonomous Communities for the period 1999-2005) we also test to see if the estimated parameters might be biased due to a problem of heteroscedasticity. After the possibility of heteroscedasticity was analyzed and rejected, results were presented using OLSQ. (*Insert Table 2*)

Models 1-4 contain estimates of the structural version of the abortion rate equation. Models 5-8 contain estimates of the reduced version. The estimations in the

reduced version may facilitate the verification of the results obtained from the structural version which might be biased if alcohol consumption is determined at the same time as the abortion rate. We repeat estimations for all alcoholic beverages grouped together (Models 1, 2, 5 and 6) and for alcoholic beverages aggregated into three main groups: wine, beer and spirits (Models 3, 4, 7 and 8). In order to avoid technical difficulties that might arise from the introduction of STDs, we carry out estimations with them (Models 2, 4, 6 and 8) and without them (Models 1, 3, 5 and 7). This strategy allows us to test how robust our estimated coefficients are after introducing health problems.

4. RESULTS.

One of the most noteworthy results of this study show that our estimations support the theoretical framework: socioeconomic conditions, lifestyles and regional characteristics determine the abortion rate. (*Insert Tables 3 and 4*)

Foreign women are more likely to abort than Spanish women. Education levels do not seem to play a special part in the abortion rate when we consider alcohol consumption levels or the prevalence of STDs. However, the situation changes when we exclude these groups of variables. This might mean that education levels do not play a significant role in the abortion decision itself but on risky behaviours such as alcohol consumption or risky sex. There is weak empirical evidence that better educated men tend to support the decision to seek an abortion whereas better educated women are against it. Employment status has an opposite effect, the abortion rate decreases with higher employment rates for men and increases as the employment rate for women increases. It is worth noting that better working conditions for men have a positive effect on family planning, whereas for women such conditions may represent a unique opportunity to enter the labour market which they would prefer not to jeopardize by giving birth to a baby that was not planned for.

Regional investment in health and education goods and services are worthwhile. In regions where there is a higher ratio of health professionals (doctors and nurses) to population, abortion rates are lower. Moreover, in Autonomous Communities where

regional governments provide greater funding for childcare, the abortion rates are also lower. Since childcare is expensive for families with babies government subsidies might solve the problem of having to withdraw from one's personal and professional circles, as well provide relief from the financial burden.

The alcohol consumption level for a region is an important lifestyle-related predictor of its abortion rate. Alcohol consumption is positively correlated with the abortion rate, and this relation holds true for wine and spirits. In the case of beer, the greater the demand, the lower the abortion rate for the region. Our data also reveal that higher prices reduce abortion rates, especially in the case of beer. Because the regional demand for beer is positively correlated with the regional abortion rate, one might expect an increase in the price of beer to have a positive effect on reducing the abortion rate. However, a policy might have any number of effects. According to the results reported in Table 3, if the price of beer increases, not only the demand for beer goes down, but also the demand for wine. The consumption of wine is positively correlated with the demand for spirits. Therefore, an increase in the price of beer price reduces the demand for beer, but also the demand for wine and spirits which might lead to a lower abortion rate for the region. In addition, raising the minimum drinking age is also an effective policy for reducing levels of alcohol consumption and the number of unplanned pregnancies.

Lastly, policy makers should include measures to tackle risky sexual behaviours as a priority on their agenda. When the prevalence of STDs is introduced, the estimated parameters of the variables related to alcohol consumption and education levels lose intensity and/or statistical significance. We conclude that abortion rates are higher in Autonomous Communities that have high AIDS and syphilis rates. If people do not take precautionary measures to prevent chronic illnesses, they will not do so to prevent unplanned pregnancies, either. Special care must be taken when interpreting these results since the prevalence of STDs is considered as a proxy for the cost of risky sexual behaviours and the aim is not to measure the impact of STDs on abortion rates. The number of new AIDS cases is low enough for us to conclude that women with AIDS seek abortions in order to avoid transmitting the disease to a newborn baby.

5. DISCUSSION

The main conclusion of this study is that individual profiles (socio-economic status and lifestyles) and regional characteristics (health policies and education levels) are important determinants of the abortion rate. Our results highlight the need for public policy that is designed specifically to reduce alcohol abuse, improve citizens' working conditions and promote gender equity by providing state-funded childcare.

The World Health Organization recommends at least one reproductive health information centre for every 100,000 people, and Spain is far from fulfilling this recommendation. Several socioeconomic factors are associated with abortion risks (Pedersen et al., 2006), and sexual and reproductive health informative centres might help to lessen the gap attributable to socioeconomic inequalities. Given that a number of characteristics (nationality, age, marital status, education level and working conditions) influence the probability that a woman will seek an abortion, health care professionals at sexual and reproductive health information centres should take them into account (Bankole et al., 1999).

Unsafe sex and the use of drugs, both legal and illegal, are two more reason for why guidance programs on sexual and reproductive health and prevention should be established at education centres (Carvalho et al., 2008). Some authors go one step further, calling for extending information programs from early young adolescence to adulthood (Harvey and Gaudoin, 2007).

Education is a widely used general socioeconomic indicator that is especially useful for sexual and reproductive health studies. Education level is closely related to knowledge and skills that women have for successfully avoiding unplanned pregnancies and consequently education plays a strong role in preventing abortions (Mason, 1984). The fact that young men appear less inclined to use contraception is disturbing, and must be addressed in sex education and individual counselling to promote better sexual and reproductive health (Ekstrand et al., 2007; Larsson et al., 2007).

Figures on practices in Spain mirror data from across the globe. The male condom is the most commonly used method for sexual intercourse for the first time with a new partner. However, the non-use or misuse of condoms is frequent in subsequent sexual relations (Gomez et al., 2007). These data suggest that information alone is not enough. The experiences of other countries offer us a glimpse of effective polices. For example, the number of induced abortions for teens in Sweden dropped after 1975 because the sex-education curriculum for schools was revised, contraceptive services were improved and abortions were provided on demand and free of charge (Santow and Bracher, 2003)

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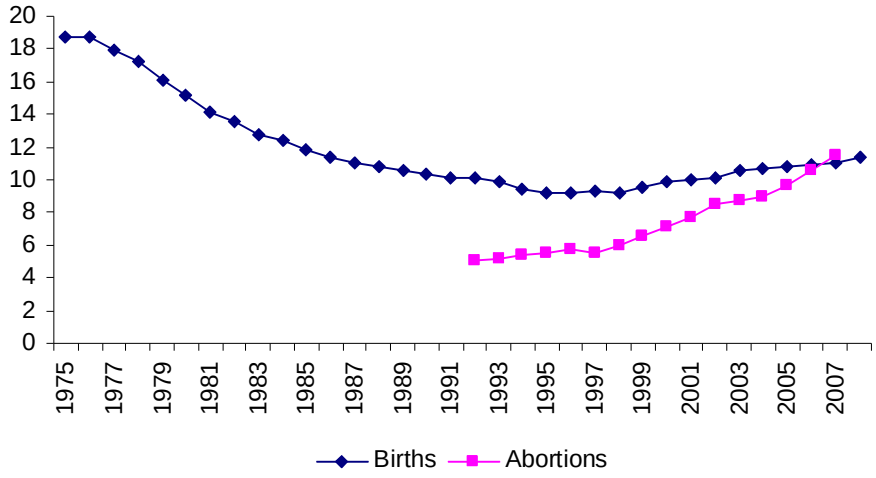
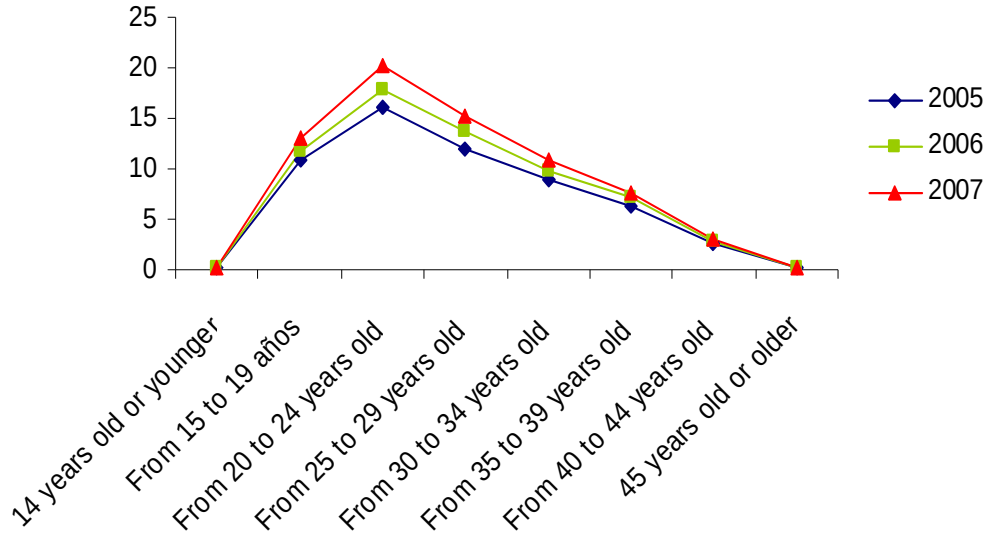
Graph 1. Number of births and abortions per 1,000 women



Source: Authors based on the: Basic Demographic Indexes. Information compiled by Spanish National Institute of Statistics (www.ine.es).

Graph 2. Evolution of number of abortions per 1,000 women by age group



Source: Authors based on the: Voluntary Pregnancy Interruption. Information compiled by Spanish Ministry of Health and Consumption (www.msc.es).

Table 1. Variables and descriptive statistics (1999-2005).

Variables	Description	Mean (St. Dev.)
Abortion Statistics. Time series: 1992-2007, Ministry of Health and Consumer Affairs		
RAbortion	Number of abortions per 1,000 women by Autonomous Community.	7.24 (3.22)
Social indicators, Spanish National Institute of Statistics		
ForeignFertileWomen	Rate of foreign women among women of childbearing age who live in Spain by Autonomous Community.	0.05 (0.04)
AIDS	Number of individuals with AIDS per 100,000 citizens by Autonomous Community.	5.38 (2.52)
Syphilis	Number of individuals with syphilis per 100,000 citizens by Autonomous Community.	2.26 (1.65)
Gonorrhoea	Number of individuals with gonorrhoea per 100,000 citizens by Autonomous Community.	26.77 (2.90)
Statistic Yearbook about Labor Issues, Spanish Ministry of Labour and Immigration		
CollegeMen	Rate of men with college studies by Autonomous Community.	0.19 (0.05)
CollegeWomen	Rate of women with college studies by Autonomous Community.	0.18 (0.04)
WorkingMen	Male employment rate by Autonomous Community.	0.58 (0.05)
WorkingWomen	Female employment rate by Autonomous Community.	0.25 (0.10)
HealthStaff	Number of doctors and nurses per 100,000 citizens by Autonomous Community.	802.50 (84.05)
Spanish National Accounts, Spanish National Institute of Statistics		
GDPpc	Gross domestic product per capita by Autonomous Community.	17,495.94 (4048.07)
Consumption Household Survey, Spanish Ministry of Food, Agriculture and Fishing		
AlcoholConsumption	Annual alcohol consumption per capita (litres).	31.72 (8.49)
WineConsumption	Annual wine consumption per capita by Autonomous Community (litres).	18.88 (7.35)
BeerConsumption	Annual beer consumption per capita by Autonomous Community (litres).	11.80 (5.18)
SpiritsConsumption	Annual spirits consumption per capita by Autonomous Community (litres).	1.02 (0.29)
AlcoholPrice	Price of alcoholic beverages (Euros/litre) by Autonomous Community.	1.35 (0.43)
WinePrice	Price of wine (Euros/litre) by Autonomous Community.	1.35 (0.67)
BeerPrice	Price of beer (Euros/litre) by Autonomous Community.	0.95 (0.14)
SpiritsPrice	Price of spirits (Euros/litre) by Autonomous Community.	7.40 (0.98)
Social Protection, Spanish Ministry of Labour and Immigration		
Childcare	Number of vacancies for babies from 0 to 3 years old in childcare centres that receive government funding.	0.03 (0.01)
Official Regional Gazettes		
DrinkingAgeMinors	This dummy variable takes the value 1 where 16 and 17 year olds were able to buy alcoholic beverages in the Autonomous Community where they live. Otherwise it takes the value 0.	0.10 (0.30)

We have also included time dummy variables (*Years1999-2005*) and geographical dummy variables (*North, South, Centre, East, Madrid* and *Islands*).

Table 2. Pending issues of the OLSQ estimations.

Endogeneity: Durwin Watson Hu's test for **H_0: Exogeneity versus H_a: Endogeneity.**	
Model 1 and Model 5	Null hypothesis rejected for *AlcoholConsumption*
Model 2 and Model 5	Null hypothesis rejected for *WineConsumption, BeerConsumption* and *SpiritsConsumption.*
Model 5 and Model 6	Null hypothesis rejected for *AIDS, Syphilis* and *Gonorrhoea*.
Heteroskedasticity: White's test for **H_0: Homoskedasticity versus H_a: unrestricted heteroskedasticity.**	
All models	Null hypothesis not rejected
Bonferroni'sPairwise correlations (significant at 5% level): **Prices and consumption of alcoholic beverages.**	
WineConsumption	is positively correlated with *SpiritsConsumption.*
WinePrices	is negatively correlated with *WineConsumption*.
BeerPrices	is negatively correlated with *Wine* and *BeerConsumption.*
SpiritsPrices	is negatively correlated with *SpiritsConsumption.*

Figures are available by request

Table 3. Estimation of abortion rates with alcohol consumption (OLSQ).

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	**Std. Err.**	**Coefficient**	**Std. Err.**	**Coefficient**	**Std. Err.**	**Coefficient**	**Std. Err.**
ForeignFertileWomen	3.12***	0.96	3.42***	0.78	3.25***	0.88	3.44***	0.74
CollegeMen	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.01
CollegeWomen	-0.02	0.03	0.01	0.02	-0.05*	0.03	-0.02	0.02
WorkingMen	-0.06***	0.01	-0.02***	0.01	-0.04***	0.01	-0.02**	0.01
WorkingWomen	0.05***	0.01	0.01	0.01	0.03***	0.01	0.01	0.01
Ln(GDPpc)	0.36***	0.06	0.31***	0.05	0.32***	0.06	0.29***	0.05
HealthStaff	-2.97***	0.61	-3.05	0.52	-2.47***	0.58	-2.62***	0.51
Childcare	-6.24***	1.41	-6.31***	1.27	-5.13***	1.35	-5.36***	1.24
AlcoholConsumption	0.01*	0.00	0.00	0.00	--	--	--	--
WineConsumption	--	--	--	--	0.02***	0.00	0.01***	0.00
BeerConsumption	--	--	--	--	-0.03***	0.01	-0.02***	0.01
SpiritsConsumption	--	--	--	--	0.13*	0.07	0.07	0.06
AIDS	--	--	8.14***	1.44	--	--	6.81***	1.42
Syphilis	--	--	3.76***	1.42	--	--	3.90***	1.36
Gonorrhoea	--	--	-0.52	0.78	--	--	-0.44	0.74
Intercept	-0.91	0.76	-3.28***	0.70	-0.61	0.72	-2.71***	0.70
F-Snedecor (Prob)	23.80		33.24		26.44		34.59	
R^2 *(corrected)*	81.6		87.8		87.8		89.1	

Notes: The estimation also includes time and geographical dummy variables

***, ** and * means that the estimated parameter is statistically significant at 1%, 5% and 10%.

Table 4. Estimation of abortion rates with alcohol policies (OLSQ).

	Model 4		Model 5		Model 6		Model 7	
	Coefficient	**Std. Err.**	**Coefficient**	**Std. Err.**	**Coefficient**	**Std. Err.**	**Coefficient**	**Std. Err.**
ForeignFertileWomen	4.30***	0.96	4.11***	0.82	4.28***	0.92	4.02***	0.78
CollegeMen	0.05***	0.02	0.02	1.12	0.04***	0.02	0.02	0.01
CollegeWomen	-0.05**	0.02	-0.01	0.02	-0.05***	0.02	-0.02	0.02
WorkingMen	-0.04***	0.01	-0.02**	0.01	-0.03***	0.01	-0.02**	0.01
WorkingWomen	0.04***	0.01	0.01	0.01	0.03***	0.01	0.01	0.01
Ln(GDPpc)	0.18***	0.06	0.24***	0.05	0.18***	0.05	0.23***	0.05
HealthStaff	-1.85***	0.53	-2.58***	0.50	-1.95***	0.48	-2.50***	0.46
Childcare	-2.43*	1.41	-4.48***	1.40	-2.26*	1.30	-3.89***	1.29
Ln(AlcoholPrice)	-0.22*	0.14	-0.16	0.12	--	--	--	--
Ln(WinePrice)	--	--	--	--	-0.11	0.08	-0.08	0.07
Ln(BeerPrice)	--	--	--	--	-0.76***	0.27	-0.67***	0.23
Ln(SpiritsPrice)	--	--	--	--	0.04	0.10	0.08	0.08
DrinkingAgeMinors	0.31***	0.07	0.16***	0.06	0.29***	0.06	0.16***	0.05
AIDS	--	--	7.16***	1.42	--	--	6.21***	1.32
Syphilis	--	--	3.14**	1.38	--	--	3.56***	1.27
Gonorrhoea	--	--	-0.46	0.77	--	--	-0.94	0.71
Intercept	-2.81***	0.82	-3.91***	0.74	-2.79***	0.78	-3.86***	0.69
F-Snedecor (Prob)	27.62		34.43		30.56		38.52	
R^2 *(corrected)*	84.4		88.6		86.8		90.4	

Notes: The estimation also includes time and geographical dummy variables

***, ** and * means that the estimated parameter is statistically significant at 1%, 5% and 10%.