Social and economic inequalities in induced abortion in Spain as a function of individual and contextual factors

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Background and objectives: The socioeconomic position of women who have an induced abortion has been explored extensively, but without taking contextual factors into account. The objective was to describe socioeconomic inequalities in the rate of induced abortion in Spain in 2001, jointly evaluating the effects of both regional and individual socioeconomic characteristics. Methods: A cross-sectional study using a multilevel approach was carried out among women who were resident in Spain in 2001, considering the hierarchical structure of relevant factors. Analyses were carried out at the individual and regional level. We fit Poisson regression models to calculate adjusted relative risks (aRR) of induced abortion and 95% confidence intervals (CIs). Results: The estimated abortion rate was 6.26 per 1000 women aged 20–49 years. Induced abortion was more frequent among younger women (aRR = 1.55 for women aged 20–24 years, compared with those aged 25–34 years) and those with less than primary education (aRR = 2.25 compared with women with university studies). Women residing in regions with lower public spending on non-university education (aRR = 0.83, 95% CI: 0.70–0.98) and a higher percentage of non-European Union immigrants (aRR = 1.06, 95% CI: 1.02–1.10) were also more likely to have had an induced abortion. Conclusions: Socioeconomic inequalities in the practice of induced abortion in Spain exist not only at the individual level but also at the regional level. The prevention of unintended pregnancy should be approached using a global political strategy aimed at changing contextual and individual factors that contribute to unintended pregnancy.

Introduction

An important requisite for women’s active participation in society is their recognized right to determine whether and when to have children.1 In general, women spend most of their reproductive life (an average of 30 years) trying to avoid pregnancy rather than trying to become pregnant. Contraception is widely used in European countries,2 although with clear variations between countries.2 Condoms and oral contraceptive pills are the most frequently used methods of contraception and both rely on consistent use to be
effective. Unintended pregnancies usually occur as a result of forgetting to take the pill, failing to negotiate condom use or failing to choose or use an effective method.\(^4,5\)

Unintended pregnancy continues to represent up to one-third of pregnancies in some European countries,\(^6\) many of which end in induced abortion, regardless of its legal status. A woman’s decision to end an unintended pregnancy is most commonly influenced by her perception that having children will change her life, interfere with her education or career, create excessive economic pressure or harm her relationship with her male partner.\(^7\)

Unlike in some European countries,\(^8\) in Spain, official estimates of the rate of unplanned pregnancies are unavailable. However, this issue has been addressed in two separate studies, which estimated that 41% of all pregnancies are unintended, of which 60% end in abortion,\(^9\) and that 32% of pregnancies among women aged 40–50 years are unintended.\(^10\) These rates are similar to those observed in other European countries. Furthermore, an upward trend in rates of abortion has been observed in young girls and those from disadvantaged social classes.\(^11\)

Social and economic inequalities that affect family planning lead to unequal prospects of preventing unintended pregnancies as a function of women’s socioeconomic position.\(^12\) Previous studies have assessed the role of educational level, social class, occupation\(^13\) and immigrant status\(^14\) on induced abortion.

The contextual, social and economic characteristics of the area in which a person lives appear to influence health in various ways.\(^15,16\) As far as we are aware, only one other study, which was carried out in the UK, examined reported abortion rates at the district level.\(^17\)

Following the end of the dictatorship in 1978, Spain was divided into 17 regions called Autonomous Communities (ACs), which represent the highest political division established under the Spanish Constitution, and between which social, cultural and economic differences are evident. In addition to Spain’s nationally applicable laws, ACs also have their own regional laws and government competencies. Based on the conceptual framework of the Commission to reduce health inequalities in Spain,\(^18\) we hypothesized that contextual (AC-level) social and economic factors influence the decision to have an abortion.

The aim of the present study was to describe socioeconomic inequalities in the rates of induced abortion among women living in Spain in 2001, and to evaluate the effects of individual and regional socioeconomic characteristics.

**Methods**

**Design, study population and information sources**

A cross-sectional population-based study was carried out using a multilevel approach. The study population consisted of all women aged between 20 and 49 years who were resident in Spain in 2001. Analyses were carried out at the individual and regional (AC) level.

The source of information on induced abortions was the register of Voluntary Interruption of Pregnancy maintained by the Spanish Ministry of Health, Social Services and Equality.\(^19\) Since 1985, authorized health centres have been required by law to complete an individual anonymous questionnaire for each induced abortion they perform. These procedures are registered within each AC, and then reported to the central register, which therefore contains data on all induced abortions carried out within a Spanish territory since 1985. Induced abortions (N = 59 743) performed in 2001 under the third legal condition of the 1985 Act on decriminalization of abortion under certain circumstances (Law 9/1985: ‘risk to the mother’s physical or mental health’) were included in this study.

The following sources of contextual data were obtained from the National Institute of Statistics (INE): The Population Census, 2001\(^20\); The Labour Force Survey, 2005\(^21\) and Public Expenditure on Education, 2001.\(^22\) Other sources of information included publications from the Spanish Social Observatory,\(^23\) the draft version of the National Strategy for Sexual and Reproductive Health from the Spanish Ministry of Health, Social Services and Equality,\(^24\) the 2006 Fertility Survey from the Centre for Sociological Research\(^25\) and a 2008 report on access to abortion services in Spain.\(^26\)

**Indicators and variables**

The dependent variable was number of induced abortions per 1000 women aged between 20 and 49 years. The denominators on which these rates are based were obtained from the last national population census (2001), which therefore requires the numerator of the abortion rate to be based on data from 2001 (Table 1).

Independent variables at the individual level were age-group (20–24, 25–34 or 35–49 years) and level of education [no or incomplete primary education (<10 years of primary schooling), complete primary (10 years of schooling), secondary (12 years of schooling) and university (>12 years of schooling)]. Data on level of education were missing for 542 cases (0.8%). All data points were available for women’s age-group.

Although much useful information could be obtained from women aged <20 years, they were excluded from this study because of the difficulty of comparing them with women aged ≥20 years, particularly in terms of educational level and relationship status.

Based on our conceptual framework,\(^18\) we explored structural aspects of the welfare state (Table 1), such as public policy on education [public expenditure on non-university education as a percentage of gross domestic product (GDP) in 2001]\(^22\) and housing (average cost of house ownership as a percentage of mean net household income in 2000).\(^23\) We also explored intermediate factors associated with regional social and economic characteristics related to productivity and reproduction, such as the percentage of unemployed individuals who are their household’s main earner (2001)\(^23\); the percentage of men in the manual social class (2004)\(^24\); the percentage of women whose main activity is unpaid home-based work, such as housework or childcare (2006)\(^25\); average number of children, defined as the number of children born to a woman throughout reproductive life, between 15 and 49 years of age (2006)\(^26\); percentage of non-European Union (EU) immigrants according to municipal registers (2005)\(^27\) and percentage of women who are practicing Catholics (2006).\(^28\) We explored access to health care using data on the level of subsidization (total, partial or no subsidization) of the expenses of barrier and emergency contraception.\(^14\) Regions can partially or totally subsidize the cost of barrier contraception (masculine preservative) for young individuals and those at risk of sexual transmitted disease and unintended pregnancy (two regions without data on subsidization were classified as ‘unknown’), or of emergency contraception for individuals at risk of unintended pregnancy. We also analyse the type of health care provider that provided induced abortion services in each AC,\(^29\) and grouped them as public and private, public only, private only or no provider.

**Statistical analysis and modelling strategy**

An ecological study was conducted to determine the distribution of induced abortion rate per 1000 women and to describe contextual socioeconomic variables by region. Quartile maps were created to detect possible geographical patterns. We tested for correlation (Spearman coefficient) between dependent and contextual variables, and among contextual variables. We also performed individual-level bivariate descriptive analyses. Multilevel Poisson regression models were fitted to jointly analyse individual and contextual characteristics. Adjusted relative risk (aRR) and its 95% confidence interval (95% CI) (fixed coefficients) and variability in the rate of abortion between regions (random intercept) are reported. The multilevel analysis consisted of fitting a basic model
adjusted for individual variables (Model 1) and a series of nested models (Models 2–5), which were fit by adding one or more contextual variables to the basic model (Table 3). The proportional reduction in random variation of the intercept with respect to Model 1 was calculated for Models 2–5 as an indicator of the variance explained by the contextual variable(s).27

All statistical analyses were performed using Stata v9.028 and HLM v6.02.29

Results

The overall abortion rate in Spain in 2001 was 6.3 per 1000 women aged 20–49 years, which varied markedly between ACs from 3.5 to 10.5 per 1000 women (Table 2 shows the distribution of regional variables).

The induced abortion rate was positively correlated with the overall abortion rate, with the percentage of non-EU immigrants and the average number of children, and was negatively correlated with the level of public expenditure on non-university education as a percentage of GDP, the percentage of men in the manual social class, the percentage of women whose main activity is unpaid home-based work and the percentage of women who are practicing Catholics (Table 3).

The induced abortion rate differed as a function of age and level of education, being higher in younger women (12.2 per 1000) and those with less than primary education (7.7 per 1000) (Table 4). After adjustment for individual variables, multilevel modelling revealed a positive correlation in aRR of induced abortion between regions, even after accounting for individual socioeconomic differences (Model 1, Table 4). Women living in regions with partial public funding of barrier contraception (Model 2, aRR = 1.40, 95%CI: 0.99–1.96), lower public expenditure on non-university education (Model 3, aRR = 0.72, 95%CI: 0.61–0.85) or a high percentage of non-EU immigrants (Model 4, aRR = 1.08; 95%CI: 1.05–1.12) were more likely to have had an induced abortion (Table 4).

Regional variability in induced abortion rates was best captured by the percentage of non-EU immigrants (72% reduction in variance with respect to the basic model), although this variability remained significant for all three models (Models 2–4, Table 4). None of the

### Table 1 Description of variables included in the multilevel analysis

<table>
<thead>
<tr>
<th>Individual-level variables</th>
<th>Description of variables and indicators</th>
<th>Source of information and year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induced abortion</td>
<td>Dummy variable (yes/no) Selected cases of induced abortion under the third legal condition (‘risk to the mother’s physical or mental health’) of the 1985 Act on decriminalization of abortion</td>
<td>Register of Voluntary Interruption of Pregnancy maintained by the Spanish Ministry of Health, Social Services and Equality, 2001</td>
</tr>
<tr>
<td>Age</td>
<td>Women age at induced abortion Grouped in: 20–24, 25–34 or 35–49 years</td>
<td>For rates denominator the Population Census from the National Statistics Institute, 2001</td>
</tr>
<tr>
<td>Level of education</td>
<td>Maximum level of education reached by women at the induced abortion Grouped in: No or incomplete primary education (&lt;10 years of schooling), complete primary (10 years), secondary (12 years) and university (&gt;12 years)</td>
<td>National Institute of Statistics, Public expenditure in education 2001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contextual (regions)-level variables</th>
<th>Description of variables and indicators</th>
<th>Source of information and year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Public expenditure on non-university education as a percentage of GDP by region</td>
<td>Social Observatory of Spain, 2000</td>
</tr>
<tr>
<td>Housing</td>
<td>Average cost of house ownership as a percentage of mean net household income by region</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labour market (productive and reproductive work)</th>
<th>Description of variables and indicators</th>
<th>Source of information and year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>Percentage of unemployed individuals who are their household’s main earner by region</td>
<td>Social Observatory of Spain, 2001</td>
</tr>
<tr>
<td>Social class</td>
<td>Percentage of men in the manual social class by region</td>
<td>Social Observatory of Spain, 2004</td>
</tr>
<tr>
<td>Immigration from non-EU countries</td>
<td>Percentage of non-EU immigrants according to municipal registers by region</td>
<td>National Institute of Statistics, Labor Force Survey, 2005</td>
</tr>
<tr>
<td>Unpaid work activity</td>
<td>Percentage of women whose main activity is unpaid home-based work, such as housework or childcare, by region</td>
<td>Centre for Sociological Research, Fertility Survey 2006</td>
</tr>
<tr>
<td>Children</td>
<td>Average number of children, defined as the number of children born to a woman throughout reproductive life, between 15 and 49 years of age by region</td>
<td>Centre for Sociological Research, Fertility Survey 2006</td>
</tr>
<tr>
<td>Beliefs and religion</td>
<td>Percentage of women who are practicing Catholics by region</td>
<td>Centre for Sociological Research, Fertility Survey 2006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access to health care</th>
<th>Description of variables and indicators</th>
<th>Source of information and year</th>
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</thead>
<tbody>
<tr>
<td>Access to barrier contraception (masculine preservative)</td>
<td>Public subsidy of barrier contraception. Categorical variable: Totally, partially or unknown level of defray of barrier contraception in young population and population at risk of sexual transmitted disease and unintended pregnancy by region</td>
<td>Ministry of Health, Social Services and Equality, Before 2008</td>
</tr>
<tr>
<td>Access to emergency contraception</td>
<td>Public subsidy of emergency contraception Categorical variable: Totally, partially or no defray and unknown level of defray of emergency contraception for population at risk of unintended pregnancy by region</td>
<td>Ministry of Health, Social Services and Equality, Before 2008</td>
</tr>
<tr>
<td>Type of provider of induced abortion</td>
<td>Type of health care service provider of induced abortion. Categorical variable: (1) Public and private health care services, (2) only public health care services, (3) only private health care services and (4) no health care services by region</td>
<td>Association of Accredited Clinics for abortion. [Access to abortion in the Spanish state. 2008]</td>
</tr>
<tr>
<td>Public funding devoted to induced abortion</td>
<td>Public funding devoted to induced abortion. Categorical variable: Totally, partially or no public funding devoted to covered induced abortion by region</td>
<td>Association of Accredited Clinics for abortion. [Access to abortion in the Spanish state. Before 2003]</td>
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</table>
Table 2: Induced abortion rates and regional socioeconomic characteristics, stratified by Autonomous Community, Spain

<table>
<thead>
<tr>
<th>Autonomous Community (regions)</th>
<th>Induced abortion rate per 1000 women aged 20–49 years, 2001</th>
<th>Public expenditure on non-university education as a % of GDP, 2001</th>
<th>% unemployed individuals who are the main earner, 2001</th>
<th>% men in the manual social class, 2004</th>
<th>Mean number of children per woman, 2006</th>
<th>Average cost of house ownership as a % of mean net household income, 2000</th>
<th>% of non-EU immigrants, 2005</th>
<th>% women whose main activity is unpaid home-based work, 2006</th>
<th>% women who are practicing Catholics, 2006</th>
<th>Public subsidy of barrier contraception (masculine preservative) (before 2008)</th>
<th>Public funding devoted to induced abortion (before 2003)</th>
<th>Public subsidy of emergency contraception (before 2008)</th>
<th>Type of health care services practising induced abortion (2008)</th>
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<tbody>
<tr>
<td>Basque Country</td>
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<td>3.28</td>
<td>23.80</td>
<td>56.60</td>
<td>1.23</td>
<td>21.80</td>
<td>2.60</td>
<td>30.20</td>
<td>32.97</td>
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<td>No</td>
<td>Total</td>
<td>Public + private</td>
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<td>5.53</td>
<td>24.30</td>
<td>61.10</td>
<td>1.31</td>
<td>17.30</td>
<td>1.44</td>
<td>39.79</td>
<td>47.16</td>
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<td>No</td>
<td>Partial</td>
<td>Only private</td>
</tr>
<tr>
<td>Cantabria</td>
<td>3.59</td>
<td>2.81</td>
<td>15.60</td>
<td>61.30</td>
<td>1.16</td>
<td>20.70</td>
<td>3.06</td>
<td>31.51</td>
<td>34.70</td>
<td>Partial</td>
<td>No</td>
<td>Total</td>
<td>Only public</td>
</tr>
<tr>
<td>Galicia</td>
<td>3.59</td>
<td>3.66</td>
<td>21.20</td>
<td>58.30</td>
<td>1.03</td>
<td>22.30</td>
<td>1.92</td>
<td>28.22</td>
<td>46.00</td>
<td>Total</td>
<td>No</td>
<td>Total</td>
<td>Only provider</td>
</tr>
<tr>
<td>Navarra</td>
<td>3.80</td>
<td>2.97</td>
<td>28.10</td>
<td>61.00</td>
<td>1.39</td>
<td>21.60</td>
<td>6.61</td>
<td>30.39</td>
<td>50.35</td>
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<tr>
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<td>4.33</td>
<td>19.80</td>
<td>64.40</td>
<td>1.34</td>
<td>22.70</td>
<td>5.38</td>
<td>44.08</td>
<td>44.66</td>
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<td>No</td>
<td>No</td>
<td>Only private</td>
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<tr>
<td>Castilla and Leon</td>
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<td>3.20</td>
<td>20.00</td>
<td>60.60</td>
<td>1.11</td>
<td>24.40</td>
<td>3.06</td>
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<td>52.04</td>
<td>Total</td>
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<td>Total</td>
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<td>1.21</td>
<td>22.10</td>
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<td>9.02</td>
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<tr>
<td>Asturias</td>
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<td>61.50</td>
<td>0.99</td>
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<td>2.04</td>
<td>33.48</td>
<td>39.74</td>
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<td>Total</td>
<td>Public + private</td>
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<tr>
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<td>25.70</td>
<td>57.10</td>
<td>1.51</td>
<td>21.50</td>
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<td>Total</td>
<td>Total</td>
<td>Public + private</td>
</tr>
<tr>
<td>Valencia</td>
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<td>3.01</td>
<td>30.40</td>
<td>59.90</td>
<td>1.39</td>
<td>22.80</td>
<td>9.11</td>
<td>28.65</td>
<td>35.20</td>
<td>Partial</td>
<td>Total</td>
<td>No</td>
<td>Public + private</td>
</tr>
<tr>
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<td>2.64</td>
<td>22.80</td>
<td>55.20</td>
<td>1.32</td>
<td>23.30</td>
<td>6.40</td>
<td>35.33</td>
<td>41.74</td>
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<td>8.74</td>
<td>2.20</td>
<td>28.70</td>
<td>54.00</td>
<td>1.47</td>
<td>22.70</td>
<td>9.26</td>
<td>21.61</td>
<td>24.77</td>
<td>Total</td>
<td>Partial</td>
<td>Total</td>
<td>Public + private</td>
</tr>
<tr>
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<td>8.87</td>
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<td>24.30</td>
<td>60.20</td>
<td>1.64</td>
<td>23.70</td>
<td>11.06</td>
<td>27.91</td>
<td>36.36</td>
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<td>Only private</td>
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<tr>
<td>Madrid</td>
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<td>Public + private</td>
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<td>Balearic Islands</td>
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<td>2.51</td>
<td>32.20</td>
<td>51.70</td>
<td>1.40</td>
<td>22.80</td>
<td>10.92</td>
<td>24.38</td>
<td>31.10</td>
<td>Partial</td>
<td>No</td>
<td>Total</td>
<td>Public + private</td>
</tr>
</tbody>
</table>

Table 3: Spearman correlations between induced abortion rate and regional socioeconomic characteristics, Spain

<table>
<thead>
<tr>
<th>Induced abortion rate per 1000 women aged 20–49 years, 2001</th>
<th>Public expenditure on non-university education as a % of GDP, 2001</th>
<th>% unemployed individuals who are the main earner, 2001</th>
<th>% men in the manual social class, 2004</th>
<th>Mean number of children per woman, 2006</th>
<th>Average cost of house ownership as a % of mean net household income, 2000</th>
<th>% of non-EU immigrants, 2005</th>
<th>% women whose main activity is unpaid home-based work, 2006</th>
<th>% women who are practicing Catholics, 2006</th>
<th>Public subsidy of barrier contraception (masculine preservative) (before 2008)</th>
<th>Public funding devoted to induced abortion (before 2003)</th>
<th>Public subsidy of emergency contraception (before 2008)</th>
<th>Type of health care services practising induced abortion (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.502*</td>
<td>0.511*</td>
<td>-0.517*</td>
<td>0.640**</td>
<td>0.593**</td>
<td>0.811**</td>
<td>-0.485*</td>
<td>-0.483*</td>
<td>1.000 women aged 20–49 years, 2001</td>
<td>Public expenditure on non-university education as a % of GDP, 2001</td>
<td>% unemployed individuals who are the main earner, 2001</td>
<td>% men in the manual social class, 2004</td>
</tr>
<tr>
<td>Public expenditure on non-university education as a % of GDP, 2001</td>
<td>-0.378</td>
<td>-0.361*</td>
<td>0.387</td>
<td>0.167</td>
<td>0.0450*</td>
<td>0.654*</td>
<td>0.568*</td>
<td>0.436</td>
<td>20–49 years, 2001</td>
<td>2001</td>
<td>2004</td>
<td>2006</td>
</tr>
<tr>
<td>% unemployed individuals who are the main earner, 2001</td>
<td>-0.278</td>
<td>0.167</td>
<td>0.517*</td>
<td>0.698**</td>
<td>0.157</td>
<td>0.646*</td>
<td>0.573*</td>
<td>0.509*</td>
<td>20–49 years, 2001</td>
<td>2001</td>
<td>2004</td>
<td>2006</td>
</tr>
<tr>
<td>% men in the manual social class, 2004</td>
<td>0.420</td>
<td>-0.402</td>
<td>0.0450*</td>
<td>0.158</td>
<td>0.166</td>
<td>0.458</td>
<td>0.728**</td>
<td>0.554*</td>
<td>20–49 years, 2001</td>
<td>2001</td>
<td>2004</td>
<td>2006</td>
</tr>
<tr>
<td>Mean number of children per woman, 2006</td>
<td>-0.398</td>
<td>0.018</td>
<td>0.517*</td>
<td>0.728**</td>
<td>0.728**</td>
<td>0.554*</td>
<td>0.667**</td>
<td>0.505*</td>
<td>20–49 years, 2001</td>
<td>2001</td>
<td>2004</td>
<td>2006</td>
</tr>
<tr>
<td>Average cost of house ownership as a % of mean net household income, 2000</td>
<td>1.000 women aged 20–49 years, 2001</td>
<td>Public expenditure on non-university education as a % of GDP, 2001</td>
<td>% unemployed individuals who are the main earner, 2001</td>
<td>% men in the manual social class, 2004</td>
<td>Mean number of children per woman, 2006</td>
<td>Average cost of house ownership as a % of mean net household income, 2000</td>
<td>% of non-EU immigrants, 2005</td>
<td>% women whose main activity is unpaid home-based work, 2006</td>
<td>% women who are practicing Catholics, 2006</td>
<td>Public subsidy of barrier contraception (masculine preservative) (before 2008)</td>
<td>Public funding devoted to induced abortion (before 2003)</td>
<td>Public subsidy of emergency contraception (before 2008)</td>
</tr>
</tbody>
</table>

*P value < 0.05; **P value < 0.01.
Table 4: Multilevel association between induced abortion rate and regional socioeconomic characteristics, Spain, 2001

<table>
<thead>
<tr>
<th>Age-group (years)</th>
<th>Induced abortion rate per 1000 women aged 20–49 years, 2001</th>
<th>Model 1: abortion risk with age + level of education</th>
<th>Model 2: abortion risk with age + level of education + public funding on contraception</th>
<th>Model 3: abortion risk with age + level of education + public funding on university education</th>
<th>Model 4: abortion risk with age + level of education + % of non-EU immigrants</th>
<th>Model 5: abortion risk with age + level of education + public funding on university education + % of non-EU immigrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–24</td>
<td>12.2</td>
<td>1.55 (1.38–1.74)</td>
<td>1.55 (1.38–1.74)</td>
<td>1.55 (1.38–1.74)</td>
<td>1.55 (1.38–1.74)</td>
<td>1.55 (1.38–1.74)</td>
</tr>
<tr>
<td>25–34</td>
<td>8.1</td>
<td>1.14 (0.99–1.33)</td>
<td>1.14 (0.99–1.33)</td>
<td>1.14 (0.99–1.33)</td>
<td>1.14 (0.99–1.33)</td>
<td>1.14 (0.99–1.33)</td>
</tr>
<tr>
<td>35–49</td>
<td>2.4</td>
<td>0.65 (0.55–1.19)</td>
<td>0.65 (0.55–1.19)</td>
<td>0.65 (0.55–1.19)</td>
<td>0.65 (0.55–1.19)</td>
<td>0.65 (0.55–1.19)</td>
</tr>
<tr>
<td>40–49</td>
<td>7.7</td>
<td>0.72 (0.61–0.85)</td>
<td>0.72 (0.61–0.85)</td>
<td>0.72 (0.61–0.85)</td>
<td>0.72 (0.61–0.85)</td>
<td>0.72 (0.61–0.85)</td>
</tr>
<tr>
<td>45–49</td>
<td>5.9</td>
<td>0.40 (0.31–0.51)</td>
<td>0.40 (0.31–0.51)</td>
<td>0.40 (0.31–0.51)</td>
<td>0.40 (0.31–0.51)</td>
<td>0.40 (0.31–0.51)</td>
</tr>
<tr>
<td>50–54</td>
<td>4.5</td>
<td>0.27 (0.20–0.38)</td>
<td>0.27 (0.20–0.38)</td>
<td>0.27 (0.20–0.38)</td>
<td>0.27 (0.20–0.38)</td>
<td>0.27 (0.20–0.38)</td>
</tr>
</tbody>
</table>

Public expenditure on non-university education as a percentage of GDP (85%, Table 4), which includes public expenditure on non-university education as a percentage of GDP and percentage of non-EU immigrants. Women living in regions with lower public expenditure on non-university education (adjusted RR = 0.83, 95% CI: [0.70–0.98]) and a higher percentage of non-EU immigrants (adjusted RR = 1.06, 95% CI: [1.02–1.10]) were more likely to have an induced abortion. Thus, in this model, the variability between regions was statistically significant despite the inclusion of more variables.

Discussion

This study shows that there is marked regional variability in rates of induced abortion in Spain, and that these differences are partly modulated by regional socioeconomic factors that act independently of individual socioeconomic characteristics. As far as we are aware, ours is the first study to describe this marked effect of a region’s socioeconomic status on induced abortion rate. Our results show that induced abortion is more frequent in regions with a high percentage of non-EU immigrants, those with limited public expenditure on non-university education as a percentage of GDP or those with limited public expenditure on barrier methods of contraception. However, rates of induced abortion are also strongly correlated with the average cost of house ownership as a percentage of mean net household income and the average number of children per female. Further, regions with lower induced abortion rates generally have a higher percentage of men in the manual social class, a higher percentage of women whose main activity is unpaid home-based work and a higher percentage of women who are practicing Catholics.

Spain has undergone two important changes in the composition of its labour force that have led to important social changes and a demand for adaptation of the labour market: the incremental incorporation of women into the labour market since the early 1980s, and the recent influx of immigrants from economically underprivileged countries. In both Spain and most other EU countries, the increased presence of women in the labour market has not been accompanied by an equitable distribution of the domestic workload, such as housework and child care. Employed women with a higher level of education have been found to be most likely to postpone childbearing, followed by less educated employed women and unemployed women, whereas women whose main activity is unpaid home-based work generally have children earlier than employed women. In the absence of policies focused on reconciling the differences between paid and unpaid work and/or addressing precariousness in the labour market, women often delay the birth of their first child until they achieve their intended level of education and subsequent stable employment.

In the labour market, unemployed women are part of the labour force and considered as employment seekers. In fact, the prospect of unemployment can discourage women from continuing their pregnancies, especially those from disadvantaged social classes. In this context, many Spanish women may decide to interrupt their pregnancy to remain active in the labour market. Moreover, Spain’s social welfare system provides 4 months of maternity leave and an income level that depends on the woman’s previous participation in the workforce. The relatively high fertility of Scandinavian countries compared with other developed countries may reflect the favourable conditions for maternity leave offered by their welfare systems, which could provide an incentive for motherhood among women with a high level of education and a high income before becoming pregnant. This is consistent with the observation that a low level of education has been found to be associated with fewer childbirths and a higher frequency of induced abortion in Norway.
The non-EU immigrants included in this study were found to be mainly of working age (16–64 years), indicating that these individuals leave their countries of origin for economic reasons. Most immigrants were from Latin America, Eastern Europe and North Africa, and although having better living conditions than in their country of origin, immigrants from poor countries still had greater job insecurity and poorer living conditions than natives.34 Nonetheless, regions with a high percentage of non-EU immigrants also generally had a high level of work activity.

As a result of the culture of property speculation in Spain, house prices rose during the period of this study, leading to an aggravation of social problems related to the affordability of housing and affecting individuals’ right to a home, especially younger individuals or those with a low income.35 Moreover, housing expenditure was found to vary from 20% to 30% between regions, with consumers in the regions of Madrid, the Basque Country, Aragon and Catalonia spending most on housing.36 These are also the regions with the highest rates of induced abortion. Education determines access to a particular occupation and thereby the level of income a person is likely to achieve. Education is also related to cultural level and influences behaviour.12 Public expenditure on education in Spain is among the lowest in the Organization for Economic Cooperation and Development, and lies below that of other countries with similar GDP.37 In 2008, Iceland devoted 7.4% of its GDP to education, whereas Spain assigned only 4.3%, despite the fact that both countries form part of the Organization for Economic Cooperation and Development. Non-university education is aimed at improving young people’s education and their chances of finding their first job after completing their mandatory education. The efficiency with which this is achieved in Spain is limited because it has the second highest percentage of students who leave school before completing their mandatory education.38 These figures reflect national and regional education policies, which have been driven by a process of decentralization, resulting in the transfer of public budgets to the ACs in the form of tax-sharing block grants, and ACs decide how to invest the budget.

Previous studies have reported a relationship between health care access and abortion rates as a result of the fact that cost may deter many women from having an abortion, especially young unmarried women, who are more likely to have limited resources.37 Although all Spanish residents have access to universal health care, induced abortion, oral contraception and Intrauterine device (IUD) were all Spanish residents have access to universal health care, induced abortion, which is the most common situation in which women actively religious women’s likelihood of becoming pregnant before marriage, which is the most common situation in which women find themselves when considering terminating their first pregnancy.41 Moreover, a religious context (e.g. public opinion or anti-abortion attitudes) could influence women’s attitudes and behaviours in relation to abortion.42 Further, behaviour in relation to abortion appears to be largely driven by clinical service availability and public abortion policies, which have been suggested by previous research to be partly driven by religious attitudes and beliefs.43

The contextual factors described previously are likely to be related to cultural, traditional and political factors that determine public policies concerning the prevention of unintended pregnancies and access to pregnancy termination.

In addition, our study showed that the rate of induced abortion in Spain lies in the middle of the range of European countries, with figures similar to those in Sweden and England.17 It also confirms that individual socioeconomic characteristics are strongly associated with the rate of induced abortion in Spain, independently of contextual socioeconomic factors: younger and less privileged women are more likely to have an abortion.33

We note the following limitations in our study. This study has been carried out using data from the registry of induced abortions, a type of register that generally seems to be less biased than population-based interviews, which are often subject to recall bias and under-reporting (interviewees may be reluctant to report an abortion), and this in turn may depend on socioeconomic factors.47 However, the information available in this type of registry may be more limited; for example, information about socioeconomic position, such as the social class of the women or her partner, was unavailable. On the other hand, educational level is widely considered to be a valid indicator of socioeconomic position and may be especially useful for our study, as it is informative regardless of age or working circumstances.48

In excluding women under 20, we have also excluded the most vulnerable population. However, this group was excluded because it became apparent that it had specific social and economic characteristics when facing unplanned pregnancy that differentiate it from women aged ≥20 years. Some women under 20 years have not finished mandatory education and have not decided on their subsequent career or education paths, and, in most cases, do not have a regular partner or their own income. Under these circumstances, pregnancy is usually unplanned and would lead to induced abortion in most cases. In fact, women under 20 have the highest percentage of induced abortion in Spain.9

We evaluated the effect of missingness on the multilevel models and found this to be minor because of the very low number of missing values. In relation to the period of study, we only used data on induced abortion from the 2001 register, as it is the year of the last national census, and the only source of information from which to compute the denominators of abortion rates stratified by educational level.

Available indicators used for contextual analysis could be recognized coming from governmental institutions that are in charge of official statistics. When possible, data from the same year were used, or the nearest year if otherwise.

We used information on regional context from different years, which appeared to be stable up until 2008, the beginning of the current economic crisis. However, the results obtained in 2001 remain valid because induced abortion maintained the same upward trend and the ACs with highest or lowest rates are the same in 2001 and 2011, as reported by the Ministry of Health in 2011.49 Furthermore, the labour market and the welfare state have deteriorated due to the financial crisis, such that the results in 2011 could be worse and the conclusions would still be valid.

In relation to regional inequalities, ACs may be considered to be ‘large’ areas with internal heterogeneity that could affect women’s family planning. However, political decision-making and action in relation to the labour market, public welfare and access to health care services fall within the jurisdiction of the ACs. Inequalities at this level may have significant consequences for women’s living conditions. On the other hand, it seems likely that induced abortion rates are influenced by more local factors related to neighbourhood and social network, which were not accounted for in this study. It also seems likely that the practice of abortion is more influenced by proximal factors that affect women’s day-to-day life,
such as local factors more related to neighbourhood and social network.50

The main strength of this study is that all our results are based on
general population samples, and hence allow us to make generaliz-
able observations, whereas being less prone to selection bias.
Regarding contextual socioeconomic factors, we consulted all
sources we were aware of that contained socioeconomic indicators
for ACs, and we performed an initial descriptive ecological analysis
to determine which socioeconomic indicators to use. To our
knowledge, socioeconomic factors at different levels related to
induced abortion have not been studied previously in Spain.

In conclusion, individual socioeconomic characteristics are
strongly associated with induced abortion rates in Spain, even
when regional socioeconomic context is taken into account.
Induced abortion is more frequent in regions with a high
percentage of non-EU immigrants and low levels of public expend-
ititure on non-university education. Rates of induced abortion are
also strongly correlated with the average cost of house ownership
as well as the average number of children. In contrast, regions with
lower induced abortion rates generally have a higher percentage
of men in the manual social class, a higher percentage of women
whose main activity is unpaid home-based work and a higher percentage
of women who are practicing Catholics.

The conclusions of this study may be applicable to other countries
with a strong Catholic tradition like Spain, and in which abortion
was previously forbidden and has only recently been decriminalized.

More research on sexual and reproductive health is required in
Spain, especially taking into account socioeconomic factors, to
develop intervention guidelines for promoting improved sexual
and reproductive health, especially in at-risk groups. As previously
noted, one important area to be addressed is the study of more
proximal contextual factors, which would improve our understand-
ning of how context influences sexual and reproductive health.

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Conflicts of interest: None declared.

Key points
• In Spain, marked regional variability in induced abortion
rates exists.
• Regional factors modulate abortion rates independently of
individual socioeconomic characteristics.
• Some of these regional factors are related to cultural and
traditional characteristics, but also political factors that
determine public policies concerning the prevention of
unintended pregnancy.

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