



Induced abortion in a Southern European region: examining inequalities between native and immigrant women

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Abstract

Objectives To examine induced abortion (IA) inequalities between native and immigrant women in a Southern European region and whether these inequalities depend on a 2010 Law facilitating IA.

Methods We conducted two analyses: (1) prevalence of total IAs, repeat and second trimester IA, in native and immigrant women aged 12–49 years for years 2009–2013 according to country of origin; and (2) log-binomial regression was used to quantify the association of place of origin with repeat and second trimester IAs among women with IAs.

Results Immigrants were more likely to have an IA than Spanish women, with the highest probability in Sub-Saharan Africa (PR 8.32 95 % CI 3.66–18.92). Immigrant women with an IA from countries other than Maghreb and Asia have higher probabilities of a repeat IA than women from Spain. Women from Europe non-EU/Romania were 50 % (95 % CI 0.30–0.79) less likely to have a second

trimester IA, while women from Central America/Caribbean were 45 % (95 % CI 1.11–1.89) more likely than Spanish women. The 2010 Law did not affect these associations.

Conclusions There is a need for parenthood planning programs and more information and access to contraception methods especially in immigrant women to help decrease IAs.

Keywords Induced abortion · Immigration · Inequalities · Repeat induced abortion · Second trimester induced abortion

Introduction

The lack of planning for a pregnancy is one of the major problems of sexual and reproductive health worldwide (Perez 2009). It is estimated that every year half of all pregnancies are unintended with 50 % resulting on an induced abortion (IA) (Sedgh et al. 2014). Of the latter, between 30 and 50 % are repeat IA and between 6 and 12 % are done in the second trimester of gestation (Laanpere et al. 2014). These conditions may lead to a greater risk for women's health status (Font-Ribera et al. 2009) and adverse outcomes in future pregnancies (Brown et al. 2008; Font-Ribera et al. 2009; Janiak et al. 2014; Jones and Finer 2012), restricted access to IA and a major social and economic cost (Font-Ribera et al. 2008, 2009; Lete et al. 2015). Spain has an average IA rate within Europe, and in contrast to other European countries with similar rates, IA rates have increased in the past decade (Sedgh et al. 2014). This pattern has also been observed in the Basque Country, Spain, a Southern European region (Ministerio de Sanidad 2015).

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The increase on IA rates in Spain between 2000 and 2010 could be attributed to the rapid growth of international immigrant population (Orjuela et al. 2009). In general, immigrant women have higher IA rates than native women (Helstrom et al. 2006; Rasch et al. 2007; Vangen et al. 2008). Similarly, immigrant women seem to have a higher probability of repeat IA (Bleil et al. 2011; Fisher et al. 2005; Laanpere et al. 2014; Picavet et al. 2013), and be more likely to second trimester IA (Jones and Finer 2012; Loeber and Wijzen 2008). The differences in material and educational resources, cultural values as well as social support between immigrant and native women could generate inequalities in opportunities to avoid unintended pregnancies and the decision of when to terminate the pregnancy (Ruiz-Ramos et al. 2012). Moreover, because few studies (Malmusi and Perez 2009; Picavet et al. 2013; Ruiz-Ramos et al. 2012; Zurriaga et al. 2009) have demonstrated variability in IA rates according to country of origin, it is necessary to consider the heterogeneity and the differences in lifestyle and health status of immigrant women. In addition, as of today no study has examined differences on overall IA rates, repeat and second trimester IAs, between immigrant and native women using a single population and/or location.

Since 2008, Spain has been on an intense crisis that in addition to its economic dimension is having important repercussions at political and social levels (Kotz 2009). This crisis has further affected reproductive health (Larrañaga et al. 2014) and access to health services (Urbanos Garrido and Puig-Junoy 2014). In addition to the immigrant population being affected the most by the crisis, the approval of the Real Decree Law 12/2012 might have increased the existing inequalities between immigrant and native women in reproductive health services (Ostrach 2013) by excluding undocumented immigrant population from the National Health System. Lastly, in 2010, a new law of sexual and reproductive health was enacted (Ariany Manso and Morlans Molina 2010) that, in addition to support the regulation of induced abortion, facilitates the legal and economic access to it (Ruiz-Ramos et al. 2012). This law was expected to increase access to IA without any legal penalty or stigma.

To investigate these issues, this study examines the differences between immigrant and native women on overall IA as well as repeat and second trimester IAs, in the Basque Country between the years 2009 and 2013. Specifically, we estimate (1) prevalence estimates and associations for all IAs, repeat IAs and second trimester IAs with country of origin using population estimates from the Basque Country Municipal Register of Inhabitants as the denominator; and (2) the associations of country of origin with repeat and second trimester IAs

among women with IAs; and whether, these associations depend on the 2010 Law in the context of the economic crisis. For this analysis, immigrant women were aggregated according to their country of origins into the following groups: Europe non-EU and Romania, Maghreb, sub-Saharan Africa, South America, Central America/the Caribbean, and Asia.

Methods

Study population and data sources

This is a cross-sectional population-based study including IA of women aged 12–49 years residing in the Basque Country, Spain, between 2009 and 2013, excluding women born in countries with a Human Development Index (HDI) very high in 2011 or >0.78 (UNDP 2011). The exclusion of women born in those countries is due to their socioeconomic position relative those from low HDI. High HDI immigrant women have similar or better socioeconomic position than natives. The latter could make hard to distinguish inequalities between native and immigrant women (Malmusi et al. 2010) Data for induced abortion (IA) came from the Department of Health of the Basque Government, Registry of Induced Abortions and included information for all the IAs conducted in the Basque Country during the study period. The data are collected through notification forms by accredited centers to conduct IAs that periodically submitted records to the Registry of Abortions. The latter validates, encrypts and processes the records according to a protocol established by the Ministry of Health, Social Services and Equality. Data for the Basque Country population were obtained from the Municipal Register of Inhabitants as of January 1st for years 2009 through 2013 according to age and country of birth of women.

Variables

The dependent variables were repeat IA and IA conducted in the second trimester among women who have an IA. A repeat IA refers to women who have previous IA. Second trimester IA was specified as those conducted after 12 weeks of gestational age (Font-Ribera et al. 2009). The independent variable was country of birth and was categorized as follows: non-European Union and Romania, Maghreb, sub-Saharan Africa, South America, Central America/the Caribbean, and Asia.

Consistent with previous studies (Font-Ribera et al. 2008, 2009; Laanpere et al. 2014; Picavet et al. 2013; Zurriaga et al. 2009), variables considered as covariates

were year of the intervention, age groups (<24, 25–29, 30–34, and 35–49), educational attainment (primary or less, secondary, university, unknown), employment status (employed, unemployed, student, unknown), living arrangement (single, couple, other arrangements, unknown) and contraception use (yes, no, unknown). In addition, 2010 Law (pre for IA conducted prior to the enforcement of the law and post for those conducted after) was also considered.

Out of the 18,349 women with an IA during the study period, we excluded those IAs conducted for fetal risk and rape ($n = 1058$); those made by women born in countries with a Human Development Index (HDI) very high in 2011 (UNDP 2011) ($n = 297$); records without information on educational attainment ($n = 382$), number of children ($n = 5$), number of IA ($n = 3$) and time of interruption of the IA ($n = 1$); or records of women reporting employment status as a pensioner ($n = 33$). These exclusions yielded 16,571 records for analysis purposes.

Statistical analysis

Prevalence estimates and associations of all IAs as well as repeat and second trimester IAs with country of birth were calculated using as the denominator the population obtained from the Municipal Register of Inhabitants of the Basque Country before and after adjusting for age and year of IA intervention.

Among women with IAs, frequencies and percentages were calculated for the total population and according to each outcome to describe the population. Chi-square test was used to determine associations of each variable with repeat IA and second trimester IA. Variables associated with the outcomes were considered during adjustment. Log binomial regression was used to quantify the strength of the association of country of birth grouping with each dependent variable before and after controlling for selected covariates. We included covariates significantly associated with the outcomes (p values <0.05) according to the similarities in the constructs they represented. Specifically, for the first adjusted model, we added 2010 Law; for the second one, we added all the socio-demographic factors; and for the final one, we added contraceptive methods. For the analyses, we used as reference categories women who have a first abortion for repeat IA and women who have a first trimester IA for second trimester IA. Interaction terms between country of birth and the 2010 Law were examined in the final models for repeat IAs and delay of IA interruption. Prevalence ratios (PR) and confidence intervals (95 % CI) were presented.

Data management and analysis were conducted using SAS version 9.4 for Windows (SAS Institute Inc., Cary, NC).

Results

Table 1 shows the prevalence of overall IA, repeat IA and second trimester IA as well as the PRs with their 95 % CIs for the association between country of birth and each outcome using the Municipal Register of Inhabitants of the Basque Country denominators before and after adjusting for age and year of IA intervention. The overall prevalence of IA in the Basque Country is 6.2 per 1000 women with the highest prevalence observed for Sub-Saharan Africa (45.6 ‰), South America (26.5 ‰) and Central America/Caribbean (22.9 ‰). On the unadjusted analysis, immigrant women were more likely to have an IA than women from Spain with the highest probability observed for women of Sub-Saharan Africa (PR 11.5 95 % CI 4.30–30.82). The same pattern was observed after adjustment for age and year of IA intervention. The prevalence of repeat IA was 1.9 and the highest prevalence was observed for Sub-Saharan Africa (21.5 ‰), South America (9.8 ‰) and Europe non-EU and Romania (8.8 ‰). This pattern persists for the unadjusted analyses. However, there was no association between country of birth and repeat IA after adjustment. For second trimester IAs, the overall prevalence was 0.3 ‰ with the highest observed for Sub-Saharan Africa (1.9 ‰), Central America/Caribbean (1.5 ‰) and South America (1.1 ‰). These patterns were observed before and after adjustments. However, it is worth noting that some countries have small number of outcomes and these results should be interpreted with caution.

Descriptive statistics for selected characteristics are presented for the total population as well as the prevalence for each outcome among women with IAs (Table 2). In general, IAs were conducted among women from Spain (56.4 %), after the 2010 Law (75.1 %), younger than 29 years of age (55 %), have a secondary education (59.6 %), were employed (55.9 %) and have children (52.4 %). In addition, a third of women were single and over two-fifths were using contraceptive. Repeat IA was associated with country of birth, year of intervention, age, living arrangement, educational attainment, employment, having children and contraceptive use. For second trimester IAs, associations were observed with country of birth, year of IA intervention, 2010 Law, age, living arrangement, educational attainment, employment, and contraceptive use.

Table 3 shows the unadjusted and adjusted PRs (95 % CI) for IA repeat. On unadjusted analysis, when compared to Spanish women, immigrant women were more likely to have a repeat IA regardless of country of birth. These associations persist after adjustment for the 2010 Law. However, after additional adjustment for age, living arrangement, educational attainment and employment, this association was not longer significant for Maghreb. In the

Table 1 Prevalence and prevalence ratios (PR) with their 95 % confidence intervals associated with country of birth on induced abortions, IA repeat and second trimester IA: Basque Country, Spain, years 2009–2013

Country of birth	Prevalence ^a (per 1000)	Unadjusted PR (95 % CI)	PR (95 % CI) ^b	PR (95 % CI) ^c	PR (95 % CI) ^d
All IA					
Spain	3.9	1.00	1.00	1.00	1.00
Europe non-EU and Romania	19.0	4.84 (1.80–13.00)	3.77 (1.43–9.92)	4.82 (1.86–12.46)	3.72 (1.67–8.30)
Maghreb	15.6	3.97 (1.47–10.74)	3.07 (1.17–8.09)	3.92 (1.51–10.27)	3.02 (1.35–6.76)
Sub-Saharan Africa	45.6	11.51 (4.30–30.82)	8.49 (3.18–22.68)	11.50 (4.43–29.85)	8.32 (3.66–18.92)
South America	26.5	6.72 (2.52–17.96)	5.63 (2.22–14.26)	6.75 (2.64–17.25)	5.60 (2.61–12.01)
Central America/Caribbean	22.9	5.83 (2.16–15.72)	4.70 (1.80–12.26)	5.78 (2.22–15.06)	4.60 (2.07–10.26)
Asia	17.7	4.50 (1.67–12.12)	3.82 (1.48–9.89)	4.46 (1.70–11.69)	3.76 (1.69–8.37)
Total	6.2				
Repeat IA					
Spain	1.0	1.00	1.00	1.00	1.00
Europe non-EU and Romania	8.8	9.20 (3.39–25.00)	1.15 (0.66–2.01)	9.13 (3.50–23.81)	1.15 (0.72–1.82)
Maghreb	5.3	5.55 (2.02–15.21)	1.08 (0.63–1.86)	5.47 (2.07–14.46)	1.08 (0.68–1.70)
Sub-Saharan Africa	21.5	22.37 (8.14–61.42)	1.36 (0.70–2.64)	22.13 (8.33–58.78)	1.35 (0.77–2.36)
South America	9.8	10.28 (3.78–27.97)	1.18 (0.67–2.07)	10.12 (3.90–26.62)	1.18 (0.74–1.87)
Central America/Caribbean	7.7	8.08 (2.95–22.11)	1.13 (0.65–1.96)	7.94 (3.00–21.00)	1.12 (0.71–1.79)
Asia	6.2	6.52 (2.38–17.87)	1.11 (0.64–1.92)	6.42 (2.40–17.12)	1.10 (0.69–1.77)
Total	1.9				
Second trimester IA^e					
Spain	0.2	1.00	1.00	1.00	1.00
Europe non-EU and Romania	0.4	2.42 (0.87–6.76)	1.95 (0.72–5.24)	2.36 (0.81–6.89)	1.89 (0.72–4.97)
Maghreb	0.6	3.24 (1.16–9.05)	2.58 (0.95–7.02)	3.12 (1.09–8.97)	2.46 (0.93–6.54)
Sub-Saharan Africa	1.9	11.12 (3.95–31.27)	8.56 (3.03–24.21)	10.68 (3.82–29.83)	8.17 (3.29–20.27)
South America	1.1	6.64 (2.44–18.07)	5.68 (2.26–14.25)	6.56 (2.46–17.46)	5.60 (2.55–12.32)
Central America/Caribbean	1.5	8.64 (3.15–23.69)	7.30 (2.83–18.80)	8.28 (3.04–22.50)	6.94 (3.04–15.87)
Asia	0.7	3.87 (1.38–10.80)	3.36 (1.22–9.26)	3.71 (1.29–10.68)	3.22 (1.17–8.86)
Total	0.3				

^a *p* value for Chi-square statistics for all comparisons of prevalence estimates >0.50

^b Adjusted for age

^c Adjusted for year of intervention

^d Adjusted for age and year of intervention

^e Some of these estimates need to be interpreted with caution given their wide CIs

fully adjusted model, immigrant women from countries other than Maghreb and Asia have higher probabilities of having a repeat IA than women from Spain.

For second trimester IAs, unadjusted and adjusted analyses show that women from Europe non-EU and Romania were 50 % (95 % CI 0.30–0.79) less likely to have an IA during the second trimester while women from Central America/Caribbean were 45 % (95 % CI 1.11–1.89) more likely to have such outcome compared with women from Spain (Table 4). These associations remain nearly identical after controlling for all covariates.

No heterogeneity of the associations of country of birth with either repeat IA (*p*-interaction 0.46) or delay of IA

interruption was observed with the 2010 Law (*p*-interaction 0.85).

Discussion

Consistent with previous studies (Malmusi and Perez 2009; Ostrach 2013; Ruiz-Ramos et al. 2012; Vangen et al. 2008), our findings suggest that immigrant women regardless of the country of origin group exhibit higher probability of IA than women from the Basque Country, Spain, after controlling for age and year of IA. Moreover, women from Sub-Saharan African, South America, Central

Table 2 Distribution of characteristics of women aged 12–49 years who have had an induced abortion for the total population, repeat induced abortion and second trimester induced abortion: Basque Country, Spain, years 2009–2013

Characteristics	Total ^a (<i>n</i> = 16,571)	Repeat IA 30.2 (5010)	<i>p</i> value ^b	Second trimester IA 4.3 (706)	<i>p</i> value
Country of birth			<0.0001		0.003
Spain	56.4 (9350)	24.4 (2279)		4.3 (407)	
Europe non-EU and Romania	4.8 (795)	45.9 (365)		2.1 (17)	
Maghreb	2.8 (457)	33.7 (154)		3.5 (16)	
Sub-Saharan Africa	3.9 (678)	46.0 (312)		4.0 (27)	
South America	24.7 (4038)	36.6 (1499)		4.2 (171)	
Central America/Caribbean	5.6 (921)	33.2 (306)		6.3 (58)	
Asia	1.6 (272)	34.9 (95)		3.7 (10)	
Year of intervention			0.0006		0.001
2009	16.4 (2713)	30.6 (829)		2.9 (80)	
2010	18.4 (3042)	28.5 (867)		3.9 (119)	
2011	22.5 (3723)	28.7 (1070)		4.4 (163)	
2012	21.5 (3570)	30.5 (1088)		4.8 (173)	
2013	21.3 (3623)	32.8 (1156)		4.8 (171)	
2010 Law			0.86		<0.0001
Pre	24.9 (4133)	30.1 (1245)		3.0 (126)	
Post	75.1 (12,438)	30.3 (3765)		4.7 (580)	
Age (years)			<0.0001		0.01
<24	30.9 (5114)	21.3 (1089)		5.0 (254)	
25–29	24.3 (4024)	33.9 (1363)		3.9 (157)	
30–34	21.5 (3565)	35.5 (1266)		3.6 (128)	
35–49	23.3 (3868)	33.4 (1292)		4.3 (628)	
Living arrangement			<0.0001		0.001
Single	33.7 (5577)	31.1 (1737)		4.1 (227)	
Couples	33.7 (5587)	33.8 (1889)		3.9 (218)	
Other arrangements	27.6 (4582)	22.6 (1038)		5.2 (239)	
Unknown	5.0 (825)	41.9 (346)		2.7 (22)	
Educational attainment			<0.0001		0.04
Primary or less	16.4 (2723)	43.7 (1190)		4.0 (108)	
Secondary	59.6 (9879)	32.6 (3222)		4.1 (410)	
University	21.7 (3596)	16.2 (584)		4.5 (162)	
Unknown	2.2 (373)	3.7 (14)		7.0 (26)	
Employment status			<0.0001		<0.0001
Employed	55.9 (9260)	30.9 (2859)		3.9 (366)	
Unemployed	26.9 (4464)	37.4 (1671)		4.2 (186)	
Student	14.4 (2395)	11.7 (280)		6.0 (145)	
Unknown	2.7 (452)	44.2 (200)		2.0 (9)	
Children alive			<0.0001		0.33
Yes	52.4 (8678)	36.9 (3200)		4.1 (357)	
No	47.6 (7893)	22.9 (1810)		4.4 (349)	
Contraceptive use			<0.0001		0.0002
Yes	41.3 (6840)	25.5 (1746)		5.0 (339)	
No	22.2 (3683)	39.2 (1443)		4.2 (156)	
Unknown	36.5 (6048)	30.1 (1821)		3.5 (211)	

^a Percentage (*n*)^b *p* values for Chi-square statistics

Table 3 Unadjusted and adjusted prevalence ratios with their 95 % confidence intervals for repeat induced abortions: Basque Country, Spain, years 2009–2013

	Unadjusted	Adjusted for 2010 law	Adjusted for 2010 law, age, living arrangement, education, employment status	Adjusted for 2010 law, age, living arrangement, education, employment status, contraceptive use
Country of birth				
Spain	1.00	1.00	1.00	1.00
Europe non-EU and Romania	1.88 (1.73–2.05)	1.88 (1.73–2.05)	1.64 (1.52–1.79)	1.60 (1.47–1.74)
Maghreb	1.38 (1.21–1.58)	1.38 (1.21–1.58)	1.04 (0.90–1.20)	1.00 (0.86–1.15)
Sub-Saharan Africa	1.89 (1.73–2.06)	1.89 (1.73–2.07)	1.55 (1.41–1.71)	1.50 (1.36–1.66)
South America	1.50 (1.42–1.58)	1.50 (1.42–1.58)	1.29 (1.22–1.37)	1.28 (1.21–1.35)
Central America/Caribbean	1.36 (1.23–1.50)	1.36 (1.24–1.50)	1.12 (1.02–1.24)	1.11 (1.01–1.23)
Asia	1.43 (1.21–1.69)	1.43 (1.21–1.69)	1.22 (1.02–1.45)	1.17 (0.98–1.40)

Table 4 Unadjusted and adjusted prevalence ratios with their 95 % confidence intervals for second trimester induced abortions: Basque Country, Spain, years 2009–2013

	Unadjusted	Adjusted For 2010 Law	Adjusted for 2010 law, age, living arrangement, education, employment status	Adjusted for 2010 law, age, living arrangement, education, employment status, contraceptive use
Country of Birth				
Spain	1.00	1.00	1.00	1.00
Europe non-EU and Romania	0.49 (0.30–0.79)	0.48 (0.30–0.78)	0.49 (0.30–0.79)	0.49 (0.30–0.80)
Maghreb	0.80 (0.49–1.31)	0.79 (0.48–1.28)	0.84 (0.51–1.37)	0.85 (0.52–1.39)
Sub-Saharan Africa	0.91 (0.62–1.34)	0.88 (0.60–1.29)	0.90 (0.60–1.35)	0.91 (0.61–1.37)
South America	0.96 (0.80–1.14)	0.96 (0.80–1.14)	0.98 (0.81–1.18)	0.98 (0.81–1.18)
Central America/Caribbean	1.45 (1.11–1.89)	1.42 (1.09–1.86)	1.51 (1.15–1.98)	1.51 (1.15–1.99)
Asia	0.84 (0.46–1.56)	0.82 (0.44–1.51)	0.85 (0.46–1.58)	0.86 (0.46–1.61)

America/Caribbean and Asia have higher probability of second trimester IA than women from the Basque Country, Spain. However, there was no difference in repeat IA observed between immigrant and women from Spain. After controlling for 2010 law, age, living arrangement, education, employment status, contraceptive use, women with IAs from Europe non-EU and Romania, Sub-Saharan Africa, South America and Central America/Caribbean are more likely to a repeat IA compared with women from the Basque Country. Similarly, second trimester IAs, women from Central America/Caribbean exhibited a higher probability while women from Europe non-EU and Romania have a lower probability than women from the Basque Country after controlling for all covariates. These associations were not affected by the 2010 Law.

Findings related to repeat IA are mixed with some studies reporting higher probabilities among immigrant women (Addor et al. 2003; Fisher et al. 2005; Laanpere et al. 2014; Picavet et al. 2013) and others reporting that the probability of IA repeat among immigrant women depends on length of stay in the host country relative to

native women (Helstrom et al. 2003; Prey et al. 2014). For instance, Picavet et al. using hospital records from Netherlands show that immigrant women from the Caribbean, Morocco, and Turkey have higher prevalence of repeat IA than native women (Picavet et al. 2013). In contrast, du Pray et al. found that the probability of having a repeat IA depends on time in the host country with immigrant women residing ≥ 10 in Canada exhibiting lower odds of having a repeat IA while immigrant women with < 10 years residing in Canada having a greater odds of a repeat IA compared with Canadian women. While there is some overlap between the immigrant populations included in these studies and our population, the discrepancy in findings could be due to the fact that these studies do not use registry data, use non-representative and smaller sample of immigrants as well as country groups or classifications.

While few studies have examined second trimester IA (Font-Ribera et al. 2009; Loeber and Wijzen 2008), the evidence consistently points out to higher prevalence among immigrants relative to native women. For example,

Loeber and Wijzen using population from Surinam, Netherlands Antilles, Morocco, and women from other countries in Africa found that immigrant women have higher probability of having an abortion at ≥ 15 weeks of pregnancy than Dutch women.

Among women with IA, we found that immigrant women were more likely to have repeat IA than women from the Basque Country with the exception of Maghreb and Asia. Although past studies do not examine repeat IA, those studies focusing on IA report lower rates for China (Malmusi and Perez 2009) and for Asia (Ruiz-Ramos et al. 2012). There is not a direct comparison for Maghreb. However, a previous study report higher rates of IA for women from Morocco relative to women from Netherlands (Picavet et al. 2013). For the second trimester IA interruption, women from Europe non-EU and Romania have a lower probability than women from the Basque Country. The opposite was true for women from Central America/Caribbean. It is worth underscoring that the migration patterns and the culture around IA of these groups are very different: women from Europe non-EU and Romania have a longer time of residence in Spain and are from countries where IA are regulated under the national health services while women from the Central America/Caribbean are a more recent migration and are from countries where IAs are not allowed under any circumstances (de Gil 2014; Laanpere et al. 2014). Finally, when it comes to IA frequencies over the years considered for the study, there was some variations but it was consistent across all groups with the greatest upward variability observed after year 2010 when the Law was enacted.

Among the limitations of this study are the cross-sectional nature of the data and the limited information available through the registry. The use of cross-sectional data precludes establishing a temporal relationship between exposure and outcome. Other limitations include the lack of information on of length of residence in the Basque Country, as well as contraception practice in the country of origin and religion affiliation for immigrant women in the registry. Although registries tend to have limited information, we did have access to socioeconomic indicators such educational attainment and employment status for each woman. The latter allows us to control for these characteristics. Despite these weaknesses, our study includes a large and diverse population representing women seeking an IA in the Basque Country.

Conclusions

Immigrant women have higher rates of IA and repeat IA than women from the Basque Country after controlling for age and year of intervention. For delay of IA interruption, women from Europe non-EU and Romania have lower

probability while women from Central America/Caribbean have higher probability than their counterparts from the Basque Country. These findings were observed regardless of the 2010 Law in the context of the economic crisis and the Real Decree suggesting that access to abortion remains unchanged for everyone. However, it is possible that the Real Decree may affect access to health services in general to the immigrant population in the years to come. Thus, it is worth noting that the Basque Country has taken measures to avoid restricting/affecting access to health services for the immigrant population regardless of their legal status. Despite these efforts, the results called attention to access to sexual and reproductive health education for all women, especially for immigrant women. Specifically, there seems to be a need of parenthood planning programs and more information and access to contraception methods. Such programs would help not only decrease IA in general but also repeat IA and as second trimester IA.

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Compliance with ethical standards

Conflict of interest None declared.

References

- Addor V, Narring F, Michaud PA (2003) Abortion trends 1990–1999 in a Swiss region and determinants of abortion recurrence. *SWISS MED WKLY* 133:219–226
- Arimany Manso J, Morlans Molina M (2010) About the new law of voluntary termination of pregnancy. *Rev Esp Med Legal* 36(2):49–50. doi:10.1016/S0377-4732(10)70044-4
- Bleil ME, Adler NE, Pasch LA, Sternfeld B, Reijo-Pera RA, Cedars MI (2011) Adverse childhood experiences and repeat induced abortion. *Am J Obstet Gynecol* 204(2):122. doi:10.1016/j.ajog.2010.09.029 (e1–6)
- Brown JS Jr, Adera T, Masho SW (2008) Previous abortion and the risk of low birth weight and preterm births. *J Epidemiol Community Health* 62(1):16–22. doi:10.1136/jech.2006.050369
- de Gil MP (2014) Contribution of the Central American and Caribbean obstetrics and gynecology societies to the prevention of unsafe abortion in the region. *Int J Gynaecol Obstet* 126(Suppl 1):S10–S12. doi:10.1016/j.ijgo.2014.03.005
- Fisher WA, Singh SS, Shuper PA, Carey M, Otchet F, MacLean-Brine D, Dal Bello D, Gunter J (2005) Characteristics of women undergoing repeat induced abortion. *CMAJ* 172(5):637–641. doi:10.1503/cmaj.1040341
- Font-Ribera L, Perez G, Salvador J, Borrell C (2008) Socioeconomic inequalities in unintended pregnancy and abortion decision. *J Urban Health* 85(1):125–135. doi:10.1007/s11524-007-9233-z
- Font-Ribera L, Perez G, Espelt A, Salvador J, Borrell C (2009) Determinants of induced abortion delay. *Gac Sanit* 23(5):415–419. doi:10.1016/j.gaceta.2008.08.001 [In Spanish]

- Helstrom L, Odland V, Zatterstrom C, Johansson M, Granath F, Correia N, Ekblom A (2003) Abortion rate and contraceptive practices in immigrant and native women in Sweden. *Scan J of Public Health* 31(6):405–410. doi:10.1080/14034940210165181
- Helstrom L, Zatterstrom C, Odland V (2006) Abortion rate and contraceptive practices in immigrant and Swedish adolescents. *J Pediatr Adolesc Gynecol* 19(3):209–213. doi:10.1016/j.jpjag.2006.02.007
- Human Development Report (UNDP) (2011) Sustainability and equity: a better future for all. Available at <http://www.unis.unvienna.org/unis/en/news/2011/human-development-report-2011.html>
- Janiak E, Kawachi I, Goldberg A, Gottlieb B (2014) Abortion barriers and perceptions of gestational age among women seeking abortion care in the latter half of the second trimester. *Contraception* 89(4):322–327. doi:10.1016/j.contraception.2013.11.009
- Jones RK, Finer LB (2012) Who has second-trimester abortions in the USA? *Contraception* 85(6):544–551. doi:10.1016/j.contraception.2011.10.012
- Kotz DM (2009) The financial and economic crisis of 2008: a systemic crisis of neoliberal capitalism. *Rev Radic Political Econ* 41(3):305–317. doi:10.1177/0486613409335093
- Laanpere M, Ringmets I, Part K, Allvee K, Veerus P, Karro H (2014) Abortion trends from 1996 to 2011 in Estonia: special emphasis on repeat abortion. *BMC Women's Health* 14:81. doi:10.1186/1472-6874-14-81
- Larrañaga I, Martín U, Bacigalupe A (2014) Sexual and reproductive health and the economic crisis in Spain SESPAS report. *Gac Sanit* 28:109–115. doi:10.1016/j.gaceta.2014.03.007 **[In Spanish]**
- Lete I, Hassan F, Chatzitheofilou I, Wood E, Mendivil J, Lambrelli D, Filonenko A (2015) Direct costs of unintended pregnancy in Spain. *Eur J Contracept Reprod Health Care* 20(4):308–318. doi:10.3109/13625187.2015.1028617
- Loeber O, Wijssen C (2008) Factors influencing the percentage of second trimester abortions in the Netherlands. *Reproductive Health Matters*. doi:10.1016/S0968-8080(08)31377-9
- Malmusi D, Perez G (2009) Induced abortion in immigrant women in a urban setting. *Gac Sanit* 23(Suppl 1):64–66. doi:10.1016/j.gaceta.2009.05.006 **[In Spanish]**
- Malumusi D, Borrell C, Benach J (2010) Migration-related health inequalities: showing the complex interactions between gender, social class and place of origin. *Soc Sci Med* 71(9):1610–1619. doi:10.1016/j.socscimed.2010.07.043
- Ministerio de Sanidad Servicios Sociales e Igualdad (2015). Datos estadísticos sobre Interrupción Voluntaria del Embarazo. 2015 Available at http://www.msssi.gob.es/profesionales/saludPublica/prevPromocion/embarazo/tablas_figuras.htm#Tabla3. Accessed July 2015
- Orjuela M, Ronda E, Regidor E (2009) Contribution of immigration to increase of legal induced abortion. *Med Clin* 133(6):213–216. doi:10.1016/j.medcli.2008.10.064
- Ostrach B (2013) “Yo no sabia...”-immigrant women's use of national health systems for reproductive and abortion care. *J Immigr Minor Health* 15(2):262–272. doi:10.1007/s10903-012-9680-9
- Perez G (2009) Sexual and reproductive health in Spain. *Gac Sanit* 23(3):171–173. doi:10.1016/j.gaceta.2009.02.004 **[In Spanish]**
- Picavet C, Goenee M, Wijssen C (2013) Characteristics of women who have repeat abortions in the Netherlands. *Eur J Contracept Reprod Health Care* 18(5):327–334. doi:10.3109/13625187.2013.820824
- Prey B, Talavlikar R, Mangat R, Freiheit EA, Drummond N (2014) Induced abortion and contraception use among immigrant and Canadian-born women in Calgary, Alta. *Can Fam Physician* 60:e455–e463
- Rasch V et al (2007) Contraceptive attitudes and contraceptive failure among women requesting induced abortion in Denmark. *Hum Reprod* 22(5):1320–1326. doi:10.1093/humrep/dem012
- Ruiz-Ramos M, Ivanez-Gimeno L, Garcia Leon FJ (2012) Sociodemographic characteristics of induced abortions in Andalusia (Spain): differences between native and foreign populations. *Gac Sanit* 26(6):504–511. doi:10.1016/j.gaceta.2011.11.017 **[In Spanish]**
- Sedgh G, Singh S, Hussain R (2014) Intended and unintended pregnancies worldwide in 2012 and recent trends. *Stud Fam Plann* 45(3):301–314. doi:10.1111/j.1728-4465.2014.00393.x
- Urbanos Garrido R, Puig-Junoy J (2014) Austerity policies and changes in healthcare use patterns. SESPAS report 2014. *Gac Sanit* 28(Suppl 1):81–88. doi:10.1016/j.gaceta.2014.02.013 **[In Spanish]**
- Vangen S, Eskild A, Forsen L (2008) Termination of pregnancy according to immigration status: a population-based registry linkage study. *BJOG* 115(10):1309–1315. doi:10.1111/j.1471-0528.2008.01832.x
- Zurriaga O, Martinez-Beneito MA, Galmes Truyols A, Torne MM, Bosch S, Bosser R, Portell Arbona M (2009) Recourse to induced abortion in Spain: profiling of users and the influence of migrant populations. *Gac Sanit* 23(Suppl 1):57–63. doi:10.1016/j.gaceta.2009.09.012