

# **The Impact of Legislation on Migrants' Health: Evidence from Spain's Legislative Response (RDL 16/2012) to the 2008 Economic Crisis**

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## **WORK IN PROGRESS**

### **Abstract**

This article investigates the impact of legislation on migrants' health using as a case study, Spain's implementation of Royal Decree 16/2012. Using pooled cross-sectional data 2009-2017 from the Spanish National Health Survey and European Survey of Health (Spain), the variables under investigation are self-reported general health and chronic illness, mental health, pap-smear and mammogram. We firstly examine the health differences between migrants and the native-born before and after the law change. The results of our multivariate models indicate that irrespective of the year, compared to foreign-born without Spanish nationality, the Spanish-born followed by foreign-born nationals report better perceived good health and mental health and are less likely to report having chronic illnesses. On the contrary, the foreign-born without Spanish nationality have better reproductive health outcomes - elucidating the healthy 'migrant' effect for the outcomes of pap-smear and mammogram. Yet, multivariate logit pre-law; post-law comparisons indicate that the timing of the law coincided with worse health outcomes among migrants relative to pap-smear, mammogram and mental health but with better perceived health and chronic illness outcomes. Employing a difference-in-difference design to test the true effects of the law on migrant's health, we find that the implementation of the law had marginal effects- increasing the likelihood of reporting a chronic illness by about 1 % in the regions where the law was fully implemented, decreasing by 1 % the likelihood of reporting good health and by approximately 5 % the odds of doing a pap-smear albeit the latter was not statistically significant.

**Keywords:** Migrants; RDL 16/2012; reproductive health; general health; mental health; Spain

### **1. Background and Aim**

The right to health - characterized as the enjoyment of the highest attainable standard of health without distinction of race, nationality, religion, political belief, economic or social condition etc. (WHO Constitution, ICESR<sup>1</sup>) is well established in international human rights law. Importantly, the international human rights framework on the right, recognizes and advocates for laws and policies to realize the right.

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<sup>1</sup> WHO (World Health Organization); ICESR(International Covenant on Economic, Social and Cultural Rights)

CESCR's<sup>2</sup> General Comment 14 for example states that the realization of the right to health may be pursued through...the formulation of health policies, or the implementation of health programmes developed by WHO, or the adoption of specific legal instruments” (General Comment 14). Additionally, the WHO's Health in All Policies advocates for consideration of the implications of health policies on health outcomes, disparities and determinants of health. In this respect, the right to health policy considerations is particularly applicable and relevant to migrants, a generally vulnerable and marginalized group in society and who are mostly affected by restrictive policies in destination countries thereby being more likely to exhibit unfavorable health outcomes.

In the specific context of Spain, the increasing inflows of migrants, with the migrant population representing approximately 12 per cent of the entire population in 2016 (Eurostat,2017), has been linked with a developing health agenda responsive to international and regional human rights law, with one of the main objectives being to eliminate health disparities. In adopting this rights-based approach to health and responding to international and regional commitments and obligations, a significant part of the health agenda in Spain has been the introduction of legislations and policies at the national level aimed at curbing health inequalities and addressing migrants' health within the overall health framework. Yet, there has been limitations in advancing the migrants' health agenda, the most notable of which is Spain's legislative response to the economic crisis of 2008 which saw the country implementing an arguably regressive law in the form of RDL 16/2012.

In the year 2012, the Spanish Government issued Royal Decree16/2012, which essentially altered healthcare entitlements under Organic Law 4/2000 which had essentially guaranteed universal access to healthcare irrespective of migrant status, with few exceptions. As a result of the law change however, coverage was more explicitly linked to Social Security entitlements – whereby only the insured and beneficiaries of the insured were entitled to public health care coverage and those outside these categories could only access health care by paying for the cost of service or through additional insurance. Additionally, several non-residents, specifically undocumented migrants lost their right to primary healthcare, except for emergency services, some aspects of maternal health and children under 18 years of age.

The literature highlights negative policy implications that may result because of restrictive policies such as RDL 16/2012. One author referencing the case of Europe has posited that “restrictive policies... are linked to a greater risk of poor general and mental health...among migrants, relative to native populations and migrants that did not experience such restrictions” (Sol Pia Juarez et al.,2019). Previous studies have

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<sup>2</sup> Committee on Economic, Social and Cultural Rights

also shown that social, economic, political and legal restrictions not only affect the deterioration of health and care, but simultaneously increases social inequalities in health due to barriers that hinder access, use and navigation through health services (Legido-Quigley et al. 2013; Vázquez & Ambler 2014; Garcia-Subirats,2014; Peralta-Gallego et al. 2018; Regidor et al. 2013). These perspectives and findings also find support in the Spanish literature where it has been found that disparities in health outcomes and health service utilization between migrants and the native-born population existed in Spain even at the point at which there were no legal barriers to health (Hernandez-Quevedo and Jimenez-Rubio, 2009; Carmona and Alcazar 2014; Keygnaerta et al., 2014; Villarroel and Artazcoz,2012; Gotsens et al. 2015; Carrasco-Garrido et al., 2009; Barroso et al.2016).

In respect of sexual and reproductive health this inequality is well documented in the literature (Fernandez and Bueno-Cavanillas, 2009; Rio et al., 2010; INE, 2012; Gispert et al. 2008; Rodríguez Álvarez et al. 2014; Hernando Rovirola et al. 2014, Keygnaerta et al., 2014).). These include lower participation in screening for breast cancer among migrant women in Spain (Rodríguez Álvarez et al. 2014) ; migrant women in Spain having more losses to follow-up treatment relative to HIV/ AIDS and worse immunological response to treatment (Hernando Rovirola et al. 2014). Previous studies have also found that migrants as compared to the native-born appear to be more likely to experience mental health problems and worse self-rated health (Malmusi and Ortiz-Barreda, 2014; Nielsen and Krasnik, 2010; Agudelo-Suarez et al. 2013; Salinero-Fort et al., 2012; Collazos Sanchez et al. 2014).

Pulling all this together, arguably the legislative changes which had been specifically designed to influence health access are expected to adversely impact health outcomes of migrants and potentially exacerbate inequalities and disparities between migrants compared to the native-born population. Yet, previous research on the impact of the Royal Decree 16/2012 has been limited, with a few policy studies on healthcare inequalities in Spain relative to migrants Vazquez et al. 2013). Using five health variables; general perceived health, mental health, chronic illness, pap smear test and mammogram, we aim in our investigation to address the gaps in the literature by investigating disparities in health outcomes between migrants and non-migrants pre and post the implementation of the law and examining and causally isolating using a difference-in-difference design, the effects of the law on migrants' health in the case of Spain. In addition, we . Our study therefore aims to address holistically, the considerations delineated in the WHO's Health in All Policies.

## **2. Methodology**

### **2.1 Data**

Pooled cross-sectional data were used for analysis. The data was drawn from four rounds of Health Surveys conducted in Spain – two from the European Health Survey of Spain (2009 and 2014) and two

from the National Health Survey of Spain (2011/12 and 2017). The surveys all collected several measures related to health to include the variables used in our analysis - general perceived health, mental health, chronic illness, pap smear test and mammogram.

Perceived health was measured using the question “perceived health in the last 12 months” which was included in all four surveys. The variable which initially had five categories was recoded into a binary one with two categories of perceived good health or not. Mental Health was measured by combining several mental health questions; 1) suffered depression in last 12 months and medically diagnosed, 2) chronic anxiety in the last 12 months and medically diagnosed, 3) other mental problems in the last 12 months and medically diagnosed.

Chronic illness was measured using the question whether or not suffered from any chronic or long-term illness. Finally, pap smear was measured by combining the questions, ‘had a pap smear and time of pap smear’. The response categories varied among the four surveys but using the questions of month and year of pap smear, allowed for the ability to harmonize the response categories. It is important to note here the cutoff applied. In that, the Spanish guideline recommends a pap smear for females 25-65 every two years, but because of the data limitation we were only able to measure every three years. Mammogram was measured by combining the questions on whether a mammogram was done and the time of the mammogram. Only persons 50-69 were included in line with Spain’s established standard and the variable coded in terms of two years ago or not.

The explanatory variables used in our models are age, live as a couple, education, region<sup>3</sup>, migration status and year of residence<sup>4</sup>. Two types of migration status were formulated for our analysis. Firstly, three a three-categories formulation of 1) Spanish-born; 2) foreign-born with Spanish-nationality; and 3) foreign-born and secondly 1) Spanish -born; 2) short-term migrants (10 years or less); and 3) long-term migrants (more than 10 years).

The data were gathered using following the surveys two-stage sampling design with stratification and are a representative sample of households and migrants in Spain. Our sample contains females only between the ages of 15-69 years and approximately 8000 (2009-11) – 9000 (2014-17) persons were included for each survey year and approximately 1000 of those being migrants each year.

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<sup>3</sup> Defined as the regions where laws/instructions were implemented to counteract RDL 16/2012 and those where neither were implemented, that is, RDL 16/2012 was fully implemented.

<sup>4</sup> Applicable to migrants only and coded into short-term (10 years or less) and long-term (more than 10 years)

## **2.2 Analysis Plan**

The tools for analysis were R-studio 3.5.2 and Statistical Packaging for the Social Sciences (SPSS) version 21. Firstly, we use logit models, deriving estimates by survey year. Logistic regressions were also performed to determine the predictors of health outcomes. Finally, to causally isolate the effects of the law on health outcomes among migrants, that is to determine the impact of the legal change on the substantive likelihood on the health outcomes, a difference-in-difference design method was employed. This method allows us to estimate the average likelihood of an individual experiencing the outcome before and after the law with the difference between the two estimates providing the treatment effect of the law. The control group used in the difference-in-difference design was persons from those regions where RDL 16/2012 was not fully implemented<sup>5</sup> and the treatment group was persons from those regions where the RDL 16/2012 was fully implemented.

## **3. Results**

In this section we explore the answers to our research questions: (1) whether migrant status is a significant predictor of health outcomes; (2) whether health outcomes vary between migrants pre and post the introduction of the law, (3) whether the passing of RDL 16/2012 limiting access to universal health care increased the likelihood that migrants would report worst perceived health, would have had more severe mental health and chronic illness outcomes and would be less likely to have done a pap smear and mammogram.

### *Description of the Variables*

Table 1 describes the variables used in the study. In all survey years, the migrant population is seen to be younger than the Spanish-born population whilst it is observed that those born in Spain generally have higher levels of education and are more likely to live in couple. On average, migrants were more likely to have reported good health and less likely to report having mental health problems and chronic illnesses. However they were on average less likely to report positive screening behaviors, that is, having done a pap smear and a mammogram. These differences are likely due to the younger age profile of migrants, which we later control for in our models.

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<sup>5</sup> These regions either implemented a counter law or instructions.

**Table 1 : Socio-demographic description of the study population**

<i>Sociodemographic Characteristics</i>	2009		2011/12		2014		2017	
	Spanish-Born	Foreign-Born	Spanish-Born	Foreign-Born	Spanish-Born	Foreign-Born	Spanish-Born	Foreign-Born
<b>Migrant Status</b>								
Spanish Born	89.6 (8296)		89.1 (7581)		89.0 (8318)		87.0(8046)	
Foreign Born	10.4 (960)		10.9(928)		10.9 (1027)		13.0 (1202)	
Foreign and Spanish Nationality	2.9 (265)		3.0 (254)		4.0 (373)		4.9 (454)	
Foreign Nationality Only	7.5 (695)		7.9 (674)		7.0 (654)		8.1 (748)	
<b>Age</b>								
15-29	14.5 (1199)	27.9 (268)	15.3 (1159)	23.7 (220)	13.8 (1149)	20.9 (215)	13.7 (1099)	17.6 (212)
30-44	33.3 (2764)	43.6 (419)	31.2 (2365)	44.4 (412)	31.9 (2656)	44.7 (459)	29.1 (2344)	43.7 (525)
45-59	32.1 (2659)	21.7 (208)	32.5 (2464)	24.9 (231)	33.0 (2745)	27.8 (286)	35.3 (2839)	29.7 (357)
60-69	20.2 (1674)	6.8 (65)	21.0 (1593)	7.0 (65)	21.3 (1768)	6.5 (67)	21.9 (1764)	9.0 (108)
<b>Education</b>								
Secondary First Stage or Below	50.8 (4212)	39.9 (383)	51.6 (3911)	43.3 (402)	46.4 (3862)	42.2 (433)	45.4 (3650)	38.9 (467)
Secondary High to Medium Grade	21.7 (1802)	34.3 (329)	22.2 (1685)	34.6 (321)	19.8 (1644)	32.3 (332)	21.1 (1695)	35.4 (426)
Tertiary	27.5 (2278)	25.8 (247)	26.2 (1985)	22.1 (205)	33.8 (2812)	25.5 (262)	33.6 (2701)	25.7 (309)
<b>Employment Status</b>								
Employed			43.3 (3284)	47.1 (437)			50.3 (4051)	52.8 (635)
Unemployed			13.3 (1005)	19.1 (177)			14.1 (1131)	18.3 (220)
Other Situations			43.3 (3282)	33.4 (310)			35.6 (2864)	28.9 (347)
<b>Civil Status</b>								
Live as Couple	62.1 (5145)	60.0 (575)	58.0 (4399)	55.0 (510)	56.9 (4695)	55.4 (556)	56.7 (4517)	51.6 (615)
Does not Live as couple	37.9 (3143)	40.0 (383)	42.0( 3182)	45.0 (418)	43.1 ( 3550)	45.5 (465)	43.3 (3444)	48.4 (576)
<b>Years of Residence in Spain</b>								
0-5 years				24.8 (228)		14.7 (150)		13.9 (166)
6 -10 years				40.3 (371)		32.9 (336)		23.7 (284)
Over 10 years				35 (322)		52.4 (535)		62.4 (748)
<b>Outcome Variables</b>								
<b>Perceived Good Health last 12 months</b>								
Yes	70.2 (5824)	78.0 (749)	71.5 (5424)	75.8 (703)	71.9 (5978)	71.9 (738)	71.0( 5715)	71.4 (858)
No	29.8 (2472)	22.0 (211)	28.5 (2157)	24.2 (225)	28.1 (2340)	28.1 (289)	29.0 (2331)	28.6 (344)
<b>Mental Health Problems last 12 months</b>								
Yes	17.8 (1477)	11.3 (108)	18.1 (1373)	11.1 (103)	18.8 (1560)	14.4 (148)	19.3 (1551)	14.2 (171)
No	82.2 (6819)	88.8 (852)	81.9 (6208)	88.9 (825)	81.2 (6758)	85.6 (879)	80.7 (6495)	85.8 (1031)
<b>Chronic Illness</b>								
Yes	54.2 (4492)	40.3 (387)	44.9 (3399)	33.4 (310)	62.8 (5219)	53.8 (553)	66.4 (5337)	56.1(674)
No	45.8 (3799)	59.7 (573)	55.1 (4172)	66.6 (618)	37.2 (3097)	46.2 (474)	33.6 (2705)	43.9 (528)
<b>Mammogram in last two years *</b>								
Yes	69.4 (2183)	47.8 (66)	78.9 (2512)	56.0 (103)	80.6(2891)	65.3 (147)	81.7 (3020)	66.0 (219)
No	30.6 (963)	52.2 (72)	21.1 (672)	44.0 (81)	19.4 (697)	34.7 (78)	18.3 (675)	34.0 (113)
<b>Pap Smear in last three years</b>								
Yes	67.8 (4760)	58.9 (482)	71.2 (4436)	63.1 (498)	73.2( 5012)	64.5 (575)	72.6 (4813)	68.8 (702)
No	32.2 (2256)	41.1 (336)	28.8 ( 1792)	36.9 (291)	26.8 (1834)	35.5 (316)	27.4 (1817)	33.2 (349)

\* Using Spain National Cancer Stratgy Guideline (2009) only women 50 -69 were included

\*\* Using Spain National Cancer Stratgy Guideline (2009) only women 25 -65 were included but every three years rather than two was used because of data issue

### **Multivariate logit findings**

Our multivariate logit findings are presented in Tables 2 to 6 All the explanatory variables were included in our models but two separate categorization of migrant status was used. Firstly, the foreign-born was included as two groups, namely, with foreign nationality only and those with Spanish nationality. Secondly, in a separate model, they were included as variables migrants with 10 years or less duration in Spain (recent migrants) and more than ten years (long term migrants). The latter was only made in the case of survey years 2011-2017.

### **Perceived Good Health**

Generally, country of birth was not found to be a statistically significant predictor of perceived good health. The only exception was in the year 2014 when it was found that the Spanish-born as compared to the foreign-born (no Spanish nationality) exhibited greater odds of reporting good health. In the 2011-2017 survey years, it is observed that the duration of residence of migrants slightly changed the outcome.

Whilst no significant relationship was observed in 2011, in 2014 and 2017 (the post-law period) it was found that the Spanish-born as compared to long-term migrants had greater odds of reporting good health but no statistically differences were observed for short-term compared with long-term migrants.

Table 2: Logistic Regression - Estimates of the Likelihood of Perceived Good Health by Year

Variables	2009				2011				2014				2017			
	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper
<b>Nationality</b>																
Spanish	0.202	1.020	0.834	1.247	-0.180	0.836	0.688	1.014	-0.306	0.737	0.609	0.891	-0.089	0.915	0.766	1.093
Foreign and Spanish	0.7	1.072	0.759	1.514	-0.141	0.868	0.61	1.237	-0.004	0.996	0.743	1.336	0.232	1.261	0.968	1.643
Foreign ~																
<b>Education</b>																
Secondary First Stage or Less	0.927	2.526	2.222	2.872	1.000	2.719	2.364	3.127	0.867	2.379	2.114	2.677	0.812	2.252	2.004	2.529
Secondary High to Medium Grade	0.385	1.469	1.262	1.711	.446	1.562	1.325	1.840	0.356	1.428	1.235	1.651	0.518	1.679	1.465	1.925
Tertiary ~																
<b>Civil Status</b>																
Live as Couple	-0.110	0.896	0.811	0.99	-0.151	.860	.775	.953	-0.011	0.989	0.897	1.091	-0.124	0.884	0.802	0.973
Does not Live as couple ~																
<b>Age</b>																
	0.450	1.046	1.042	1.05	.440	1.045	1.041	1.049	0.042	1.043	1.039	1.047	0.036	1.037	1.033	1.041
<b>Nationality and Duration</b>																
Spanish					-0.150	0.861	0.665	1.115	-0.303	0.738	0.605	0.901	-0.275	0.760	0.643	0.898
Migrants -10 years or less residence					-0.012	0.988	0.715	1.367	0.007	1.007	0.756	1.341	-0.263	0.769	0.582	1.015
Migrants - more than ten years ~																

p > .05

~ Reference Category OR = Odds Ratio CI = Confidence Interval

## Chronic Illness

Country of birth (with the exception of 2011) made a significant contribution to the model on chronic illness generally. Notably, having Spanish nationality (native or foreign-born) as compared to the foreign-born (only), was found to be associated with decreased odds of reporting a chronic illness. Relative to duration, only in the year 2017 did the variable contribute to our model – it was found that the Spanish-born compared to long-term migrants were less likely to have reported a chronic illness. No statistically differences obtained however between short-term and long-term migrants.

## Mental Health

Except for 2014 where country of birth was not found to be a significant predictor of mental health problems, the Spanish-born as compared to the foreign-born (only) were found to be less likely to report mental health problems. There were no statistically significant differences observed however between the foreign-born with Spanish nationality and those without. The Spanish-born compared to long-term migrants were also less like to report mental health problems in 2011 with no statistically significant differences observed in 2014 and 2017. Only in 2014 was any statistically differences between short-term and long-term migrants observed with short term migrants being 1.8 times more likely than long-term migrants to report a mental health problem.

**Table 3: Logistic Regression - Estimates of the Likelihood of Chronic Illness Health by Year**

Variables	2009				2011				2014				2017			
	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper
<b>Nationality</b>																
Spanish	-0.366	0.694	0.586	0.822	-0.292	0.747	0.625	0.893	-0.170	0.843	0.712	0.999	-0.370	0.691	0.589	0.811
Foreign and Spanish	-0.441	0.644	0.477	0.868	-0.342	0.710	0.520	0.969	-0.106	0.900	0.688	1.176	-0.292	0.747	0.582	0.958
Foreign ~																
<b>Education</b>																
Secondary First Stage or Less	-0.378	0.685	0.617	0.761	-0.388	0.678	0.605	0.760	-0.434	0.648	0.585	0.718	-0.385	0.68	0.612	0.756
Secondary High to Medium Grade	-0.134	0.887	0.775	0.987	-0.213	0.808	0.708	0.921	-0.212	0.809	0.718	0.913	-0.263	0.769	0.681	0.868
Tertiary ~																
<b>Civil Status</b>																
Live as Couple	0.039	1.040	0.950	1.139	0.062	1.064	0.968	1.168	.118	1.125	1.026	1.234	0.060	1.062	0.966	1.167
Does not Live as couple ~																
<b>Age</b>																
Age	-0.046	0.955	0.952	0.958	-0.047	0.954	0.951	0.958	-0.048	0.953	0.950	0.956	-0.048	0.953	0.950	0.957
<b>Nationality and Duration</b>																
Spanish					-0.009	0.992	0.785	1.253	-0.122	0.885	0.735	1.065	-0.163	0.850	0.723	0.999
Migrants - 10 years or less residence					0.286	1.331	0.992	1.786	0.012	1.012	0.782	1.311	0.241	1.273	0.994	1.630
Migrants - more than ten years ~																

p > .05

~ Reference Category OR = Odds Ratio CI = Confidence Interval

**Table 4: Logistic Regression - Estimates of the Likelihood of Poor Mental Health by Year**

Variables	2009				2011				2014				2017			
	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper
<b>Nationality</b>																
Spanish	-0.263	0.769	0.594	0.994	-0.437	0.646	0.494	0.845	-0.229	0.795	0.621	1.018	-0.322	0.725	0.576	0.913
Foreign and Spanish	-0.090	0.914	0.589	1.419	-0.426	0.653	0.421	1.014	-0.295	0.745	0.518	1.071	-0.271	0.762	0.545	1.067
Foreign ~																
<b>Education</b>																
Secondary First Stage or Less	-0.884	0.413	0.353	0.484	-0.716	0.489	0.416	0.575	-0.826	0.438	0.38	0.504	-0.768	0.464	0.404	0.533
Secondary High to Medium Grade	-0.423	0.655	0.543	0.790	-0.217	0.805	0.663	0.976	0.499	0.607	0.512	0.720	-0.489	0.613	0.521	0.723
Tertiary ~																
<b>Civil Status</b>																
Live as Couple	0.407	1.502	1.340	1.684	0.419	1.52	1.351	1.710	0.405	1.499	1.342	1.674	0.462	1.587	1.422	1.772
Does not Live as couple ~																
<b>Age</b>																
Age	-0.032	0.968	0.964	0.973	-0.035	0.965	0.961	0.970	-0.036	0.964	0.960	0.969	-0.035	0.966	0.962	0.970
<b>Nationality and Duration</b>																
Spanish					-0.342	0.71	0.509	0.991	-0.085	0.919	0.728	1.16	-0.142	0.868	0.711	1.06
Migrants - 10 years or less residence					0.341	1.406	0.919	2.152	0.64	1.896	1.31	2.744	0.78	2.181	1.489	3.195
Migrants - more than ten years ~																

p > .05

~ Reference Category OR = Odds Ratio CI = Confidence Interval

## Pap- Smear

All the variables included in our model made a statistically significant contribution. In all four survey years, the Spanish-born and the foreign-born with Spanish nationality demonstrated lower likelihoods of doing a pap-smear compared to the foreign-born. Furthermore, except for the year 2017 (and 2009 which was not included), migrants with short-term duration of residence were found to be statistically more likely to have done a pap-smear in the past three years compared to migrants with longer duration. On the other hand, in 2014 and 2015 (2011 was not statistically significant), the Spanish-born exhibited a lower likelihood of doing a pap-smear as compared long-terms migrants.



**Table 5: Logistic Regression - Estimates of the Likelihood of Pap Smear by Year**

Variables	2009				2011				2014				2017			
	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper
<b>Nationality</b>																
Spanish	-0.557	0.511	0.426	0.613	-0.573	0.564	0.468	0.679	-0.649	0.523	0.433	0.631	-0.609	0.544	0.456	0.649
Foreign and Spanish	-0.401	0.670	0.484	0.928	-0.361	0.697	0.495	0.980	-0.510	0.600	0.444	0.812	-0.652	0.521	0.392	0.693
Foreign ~																
<b>Education</b>																
Secondary First Stage or Less	0.871	2.390	2.110	2.706	0.974	2.303	2.303	3.043	0.942	2.564	2.263	2.906	0.734	2.083	1.841	2.357
Secondary High to Medium Grade	0.252	1.287	1.114	1.486	0.386	1.252	1.252	1.727	0.251	1.285	1.104	1.495	0.183	1.200	1.037	1.389
Tertiary ~																
<b>Civil Status</b>																
Live as Couple	-0.680	0.507	0.457	0.561	-0.508	0.602	0.540	0.670	-0.477	0.621	0.559	0.690	-0.440	0.644	0.580	0.715
Does not Live as couple ~																
<b>Age</b>																
	0.14	1.014	1.010	1.019	0.013	1.013	1.013	1.018	0.120	1.012	1.007	1.017	0.023	1.024	1.019	1.029
<b>Nationality and Duration</b>																
Spanish					-0.254	0.776	0.600	1.004	-0.310	0.733	0.598	0.900	-0.326	0.774	0.650	0.923
Migrants -10 years or less residence					0.363	1.438	1.05	1.968	0.333	1.395	1.047	1.859	0.131	1.015	0.770	1.337
Migrants - more than ten years ~																

p >.05

~ Reference Category OR = Odds Ratio CI =Confidence Interval

## Breast Mammogram

Being Spanish born was also found to be associated with decreased odds of having done a mammogram in the past two years. This finding was consistent across all four survey years. However, those with both Spanish and foreign nationality demonstrated being statistically more likely to have reported doing a mammogram only in the years 2014 and 2017. Additionally, it is observed that the Spanish born compared to long-term migrants had decreased odds of doing a mammogram between 2011 and 2017. On the contrary, when compared to long-term migrants, short-term migrants had a greater likelihood of doing a breast mammogram although this was not significant in 2014.

**Table 6: Logistic Regression - Estimates of the Likelihood of Mammogram by Year**

Variables	2009				2011				2014				2017			
	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper	$\beta$	OR	Lower	Upper
<b>Nationality</b>																
Spanish	-1.228	0.293	0.184	0.467	-1.368	0.255	0.176	0.368	-1.122	0.326	0.223	0.476	-1.015	0.362	0.264	0.497
Foreign and Spanish	-0.560	0.571	0.287	1.138	-0.717	0.488	0.254	0.939	-0.705	0.494	0.280	0.873	-0.559	0.572	0.357	0.916
Foreign ~																
<b>Education</b>																
Secondary First Stage or Less	0.339	1.403	1.114	1.766	0.305	1.356	1.052	1.749	0.261	1.298	1.045	1.613	0.179	1.196	0.975	1.467
Secondary High to Medium Grade	0.209	1.233	0.935	1.624	-0.193	0.824	0.601	1.132	0.076	1.079	0.821	1.418	0.17	1.185	0.926	1.516
Tertiary ~																
<b>Civil Status</b>																
Live as Couple	-0.205	0.815	0.698	0.951	-0.285	0.752	0.636	0.890	-0.408	0.665	0.566	0.782	-0.442	0.643	0.548	0.754
Does not Live as couple ~																
<b>Age</b>																
	0.19	1.019	1.005	1.033	0.008	1.008	0.993	1.023	0.016	1.016	1.002	1.031	-0.005	0.995	0.981	1.009
<b>Nationality and Duration</b>																
Spanish					-0.601	0.548	0.355	0.846	-0.636	0.530	0.371	0.757	-0.582	0.559	0.419	0.745
Migrants -10 years or less residence					1.139	3.124	1.687	5.786	0.545	1.724	0.952	3.122	0.733	2.081	1.230	3.52
Migrants - more than ten years ~																

p >.05

~ Reference Category OR = Odds Ratio CI =Confidence Interval

### *Difference – in- difference regression*

Finally, we present the findings from our difference-in-difference design. As a first step we graphically depict the general trends in the pre-post period based on the predicted probabilities of our health outcomes among migrants (see Figure 1). It is observed from the graph how the probabilities of doing a pap smear and a mammogram decreased between the pre-law and post-law periods. On the other hand, the probability of reporting mental health problems as well as chronic illness showed a decrease while the probabilities of perceived good health increased. Evidently the findings except in relation to pap-smear and mammogram are inconsistent with our expectations but since they do not account for confounding effects, without more should not be relied on as an accurate description of the effect of the law change.

Figure 2: Predicted probabilities pre and post the law change



Whilst our first pre-post comparisons show upward trends, when we aim to isolate the causal effects of the law through our fitted regression model, it can be observed (See Table 2) from the interaction that the effect of the law was to reduce in the post-law period the likelihood of reporting good health in the regions where the law was implemented by about 1 %. Similarly, the law change was found to have increased by about 1% the likelihood of reporting a chronic illness in those regions where the law was fully implemented. The greatest effect was found to be relative to pap-smear with the effect of the law change reducing by about 4% the likelihood of doing a pap-smear. However, the effect is not a

statistically significant one but confirmed our expectations in respect of the direction of the effect of the law on pap-smear outcomes.

**Table 2: Difference-in-Difference Regression Estimate**

	<b>Pap-Smear</b>	<b>Chronic Illness</b>	<b>Perceived Health</b>	<b>Mental Health</b>	<b>Mammogram</b>
<b>Treatment</b>	-0.032	0.001	-0.014	-0.001	0.04
<b>Period (Pre-Post)</b>	0.084	-0.193	0.064	-0.026	-0.146
<b>Treatment:Period)</b>	-0.046	0.014*	-0.014*	-0.012	0.30

\*  $p < 0.05$

#### 4. Discussion

To the extent that policies play a major role in health equity, we argued that RDL 16/2012, which was a fiscal response to the 2008 economic crisis in Spain, was not only regressive but potentially could lead to poorer health outcomes among migrants and also widen the health inequalities between migrants and non-migrants. To test the effects of the law, we applied a difference-in-difference design to quantify the impact of the law change on five health outcomes, namely, perceived good health, pap-smear and mental health, chronic illness and mammogram. Furthermore, in keeping with the WHO's Health in All Policies which advocates for consideration of the implications of health policies on health outcomes, disparities and determinants of health, we also estimated the predictors of these health outcomes mainly to determine the role of migrant status.

In determining the impact of migrant status on our health outcomes of interest, we distinguished between migrants who are foreign-born with Spanish nationality and those foreign-born without as well as between short-term and long-term migrants. Consistent with the literature, we found that health outcomes vary between migrants and non-migrants, generally with both the Spanish-born and the foreign-born with Spanish nationality, exhibiting more favorable health outcomes as compared to the foreign-born: in order of significance, the latter more likely experiencing unfavorable outcomes. This was the case for self-reported health, mental health and chronic illness albeit in respect of perceived health only in 2014 was a statistically significant relationship found.

In terms of short-term migrants compared with long-term migrants, only with respect to mental health (2014), pap-smear and mammogram did this categorization make any significant contribution, with

shorter term migrants exhibiting better outcomes. In respect of mental health however, it was observed for the one year where a statistically significant contribution was found (2014) that longer-terms migrants had better health outcomes. This plausibly is on account of duration effects associated with the healthy ‘migrant’ paradox that has been espoused in more recent literature, where over time migrants are deemed to converge on the native-born population. This interpretation is demonstrably in line with such theory as the native-born population was consistently found to have mental health advantage. However, as this result was only found for one year, we allude to conclusive evidence of the migrant paradox and duration effects theory based on this finding with caution. Notwithstanding, stronger and more conclusive support for and evidence of the healthy ‘migrant’ paradox and duration effects was arguably found with respect to our findings on pap-smear and mammogram.

Inconsistent with the literature, it was found that pap smear and mammogram were more likely to be done by the foreign-born population and observed that migrants with shorter-term duration had greater odds than longer-term migrants to have done a pap-smear and a mammogram. The pattern emanating from these findings which provide support for the healthy ‘migrant’ paradox and duration effects therefore is such that - where the longer-term migrants have health advantage over the shorter-term migrants (mental health) so does the native-born and where migrants enjoy health advantage over the Spanish-born, the shorter-term migrants also enjoy health advantage over the longer-term ones.

As RDL 16/2012 was not implemented equally in all the Autonomous Communities, we had the unique opportunity to causally isolate the effects of the law on our outcomes using the regions where the law was not fully implemented as control. Interestingly, the only significant associations gleaned from such inclusion was in respect of perceived health and chronic illness and only marginally. We firstly determined through pre- post law comparisons of multivariate logits that not all the health outcomes of migrants were predicted to worsen in the post-law period, specifically perceived-health and chronic illness. We argue that such contrary finding is attributable to our method of analysis which essentially is a pre-law/post-law comparison which fails to take into consideration important confounding factors within the two periods. Such an explanation is supported when we consider our difference-in-difference approach whereby it was evident that pre-test; post-test comparisons without more, can mask confounders and thereby lead to results that do not fully account for the situation at hand. Relative to chronic illness for example, unlike the pre-test; post-test comparisons, our difference-in-difference regression estimator revealed that, albeit marginally, the effect of the law was to increase the likelihood of reporting chronic illness by 1%. The same principle is also demonstrated with respect to perceived health where our pre-test; post-test comparisons suggested better health outcomes among migrants post the law change but the

difference-in-difference regression estimator revealed the effect of the law was to reduce by about 1 % the likelihood of reporting good health.

The finding of little to no effect generally could be attributable to the fact that regional practices may have remained relatively unchanged as a result of the previous universal health care practice and it is the practices which arguably impact outcomes more so than the laws governing the system. Additionally, there might not have been enough time for the effect of the law to be realized especially in light of the fact that the laws were later reversed. Notwithstanding only marginal effects, our causal isolation in respect of perceived-health and chronic-illness is particularly important to this study and justified. In that, a simple pre-law/post-law regression estimate showed better outcomes in the post-law period but when we isolate the causal effects of the law through our fitted regression difference-in-difference model, the results indicate that the law had the opposite effect of the pre-law; post-law comparisons. Evidently, the trends observed could have been altered due to other confounding variables, which our difference-in-difference model sought to disentangle.

## **5. Conclusion**

It is evident from our study that health outcomes vary between the foreign-born and the native-born, with health advantage in favor of the native-born, except for pap smear and mammogram. Our findings also provide some support for the healthy ‘migrant’ paradox and duration effects in the case of Spain – and particularly with respect to reproductive health. Finally, whilst no significant decline was observed in the outcomes of the migrants over time based on the pre-post law comparisons, our difference-in-difference estimators -where the control region was those that did not fully implement RDL 16/2012, was justified, unmasking the confounding effects of such comparisons to reveal that the law change even if marginally, had a negative effect on health outcomes, particularly perceived health and chronic health. As self-reported health usually presents a strong indication of the health status within a country, we argue that this finding is therefore important and conclude that laws and or policies do adversely affect the health outcomes of migrants.

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