EFFECTS ON UTILISATION, HEALTH AND USER SATISFACTION WHEN ACCESS TO HEALTH CARE IS LIMITED

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Abstract

In 2012, the Spanish government introduced a reform that restricted the access of undocumented immigrants to the health care system, turning a previously universal health care system into a targeted one. In this paper, we focus on the impact of this reform on health care utilisation, satisfaction and self-reported health status. We first compare the impact of the reform on undocumented immigrants vis-à-vis Spanish nationals. Secondly, in view of the fact that some regions refused to apply the new regulation, we compare the health care outcomes of undocumented immigrants across regions. Finally, we apply a triple difference model to consider access to the health care system by region and by immigrant status, before and after the reform. The results of these three analyses highlight important reductions in planned care, which do not seem to be fully compensated by higher emergency care use by the affected population. In addition, the findings reflect a sharp decrease in levels of satisfaction with the emergency services, which since the reform constitute the only health resource available to undocumented immigrants. We believe these results are important, especially in the context of discussions currently taking place in various developed countries on restricting access to health care services for certain population groups.

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1. INTRODUCTION

In addition to maximising the level of population health, the reduction of health inequalities is a political priority for many countries and an important challenge for supranational organisations such as the European Commission and the World Health Organization (WHO). Thus, the main objective of this agency's "Health for the 21st century" strategy (WHO) is "the reduction by 2020 of socioeconomic differences in at least one quarter in all member states, by considerably improving the level of health of less well-off individuals" (WHO, 1999). The European Union has been monitoring health inequalities since 2001, to evaluate the progress made towards achieving these goals, and the Spanish authorities have sought to compare results obtained in different regions (Ministry of Health and Social Policy, 2010).

In parallel, Spain has recently witnessed an unprecedented increase in its foreign population. According to the 2007 National Immigrant Survey, 2.6 million Spanish households contain at least one person born abroad (INE, Spanish Institute of Statistics, 2008), although as a result of the recent economic downturn, the figures have remained stable: in 2011, Spain received 457,650 immigrants, a slightly lower number than in 2010 (465,169) (INE, 2016).

Evidence suggests that over time there has been a persistent increase in health inequality affecting the immigrant population in Spain. In particular, while immigrants start with a lower income-related inequality in health outcomes than the native population, such inequalities increase over time, converging to the national figures (Hernández-Quevedo & Jiménez-Rubio, 2009a; Gotsens et al., 2015). Furthermore, immigrants living in Spain, despite having the same health care coverage as nationals (up to 2012) were less likely to visit a specialist and more likely to access emergency services (Hernández-Quevedo & Jiménez-Rubio, 2009b). However, the precise nature of legal, cultural or administrative access barriers to this population group remains unexplored. Potential access barriers could be demand related, or driven by culture, language command, socioeconomic context or legal status, or created by supply-related factors such as accessibility or staff attitudes. In this paper, we quantify the impact of one such barrier, legal restrictions, which were introduced by the Spanish government in 2012.

More specifically, we contribute to the literature by analysing the effects of a reduction in health insurance cover for the undocumented population in Spain. Before 2012, the health care system in Spain was universal and so undocumented immigrants were entitled to full health care cover in the same conditions as the native population. However, in 2012 the government adopted a law that prevented undocumented immigrants from accessing the health care system, with the exception of hospital A&E departments, which remained accessible for this population group. In addition to analysing various health utilisation outcomes, we make use of a unique dataset which allows us to investigate the impact of this restriction on measures of health system satisfaction, a parameter that is increasingly used as a health system performance tool. We show that there have been important reductions in planned care, which do not seem to be fully compensated by the greater use of emergency care by the affected population. In addition, the results obtained highlight a sharp fall in levels of satisfaction with the emergency services, which is the only facility still available to undocumented immigrants. Nevertheless, in the first three years since the implementation of the reform, we find no evidence of a worsening of self-assessed health. The results of our study are relevant for policy makers seeking to reduce health inequalities and to promote population health, especially in countries which have recently implemented initiatives aimed at reducing health cover for the undocumented population, such as the UK (Keith & van Ginekken, 2015). Our results could also contribute to the discussions that have recently taken place in several developed countries on introducing restrictions on health care access for certain population groups.

In addition to filling a gap in the literature on immigration and on health inequalities, we also contribute to the extensive and growing number of studies which explore the relationship between insurance cover, access to health care and self-assessed health, most importantly in the USA (see e.g. Taubman et al., 2014; Currie & Gruber, 1996). For instance, in a recent study on the effects of the expansion in health cover following the 2014 Affordable Care Act, the authors reported an important increase in health care utilisation following the reform, especially in regions which simultaneously implemented an expansion in the Medicaid programme (Courtemanche et al., 2017). However, less pronounced effects were found for self-reported health and for risky health behaviour.

Whilst there is an extensive body of literature on the effects of expanding health insurance cover, fewer studies have been made of the impact of reducing this cover. An exception to this pattern is the recent paper by Tello-Trillo (2016), which provided evidence of a substantial reduction in health care access and an increase in the number of days with bad health reported by individuals as a result of a disenrollment reform affecting mainly childless adults in Tennessee, USA (2005 Medicaid disenrollment reform). We expand the analysis of the latter paper by focusing on a nation-wide reform targeted at a specific population group, namely undocumented immigrants, a policy change which to date has received little research attention.

This paper is structured as follows. Section 2 describes the 2012 Spanish health care reform. In sections 3 and 4 we discuss the data employed and the study methods used, respectively. Section 5 presents the results of the main econometric estimations and the sensitivity analysis performed. Finally, we discuss the main policy implications and present the main conclusions drawn.

2. THE SPANISH HEALTH CARE REFORM

The Spanish National Health Service provided universal cover until 2012. It is tax funded and predominantly operates within the public sector. Competences in this field have been totally devolved to the regions since 2002 (García-Armesto et al., 2010). One of the main reforms in the health system involving the immigrant population was Act 4/2000, which granted full access to health services for undocumented individuals regardless of their nationality and legal status. The only prerequisite for non-Spaniards to receive health services on the same terms as the Spanish population was to be recorded in the municipal population register. In spite of this, there is substantial evidence that a very important point of access to health care for undocumented immigrants in Spain has been emergency care (Hernández & Jiménez, 2009b)

After four years of severe economic crisis in Spain, the government introduced a new law that changed the nature of the health care system. In April 2012, several aspects of the health system were redefined, including the beneficiaries, the universal nature of the system, the gratuity of all services and other cost containment measures (Gallo & Gené-Badia, 2013). The 2012 law specifically linked entitlement to

contribution to the system[4], thus excluding a large group of undocumented immigrants from receiving health care (see Table A1). Emergency, maternity and child care were the only services which undocumented immigrants were able to use on the same terms as Spanish nationals. At the same time, the government announced alternative health care plans for undocumented immigrants, which have since proven to be unaffordable and even more expensive than existing private insurance plans in Spain (Nuño-Solinís, 2016).

Furthermore, recent reports have documented the existence of obstacles to health service access by population groups that, in theory, are unaffected by the law, such as children, and in some cases even impediments to access to emergency care by undocumented individuals (Nuño-Solinís, 2016). The new reform has also been accompanied by great confusion about the terms of the restrictions, not only among the targeted population but also among doctors and other stakeholders in the system.

Implementation of the legislative changes has been uneven across Spanish regions (or Autonomous Communities). Some have refused to apply the new law and instead have introduced regional legislation granting access to the health system for undocumented immigrants who have been living in the region for a certain time (variable, depending on the region). For example, the Canary Islands, Andalusia and the Basque Country have all introduced such counterbalancing regional laws (Gallo and Gené-Badia, 2013). In fact, only one region has fully applied the nationwide regulations without restrictions (see Table 2) while five have introduced the national law with some minor exceptions (Bacigalupe et al., 2016). The remaining regions have introduced alternative health programmes for undocumented immigrants, which differ on the timing and access details, and other aspects specific to each region. In this study, we examine these regional asymmetries in order to identify the effects of interest.

3. DATA

This study of the impact of the ban on health care access for undocumented immigrants makes use of data published by the *Barómetro Sanitario* (Spanish Health Barometer, SHB), a national survey that collects information on opinions, attitudes,

[4] Other minority groups, such as individuals aged 26 or more with no experience in the labour market and an annual income exceeding 100, euros, were also excluded from access to the health care system.

utilisation and perceptions of health services among a representative cross-section of the Spanish population, aged 18 and above. The survey has been conducted by the Centre for Sociological Research three times a year since 1996, obtaining a total sample of over 6000 respondents per year. Although our study is based on the surveys conducted from 2008 to 2015, information on two of the outcomes of interest (satisfaction with emergency care and self-assessed health) was only included in the survey results in 2010 and so, for these two outcomes, the relevant period included in our analysis is 2010-2015. Nevertheless, the time frame considered contains a reasonable amount of data for the periods before and after the implementation of the law, in the last quarter of 2012.

For the purposes of this study, the post-reform period is taken as the time immediately following the implementation of the nationwide law, on 1 September 2012 (the period covered by Phase 3 of the 2012 survey, published in October, the full years 2013, 2014 and Phases 1 and 2 of 2015, published in March and June). Similarly, year 1 pre-reform is described by the survey results of Phase 3 of 2011 and Phases 1 and 2 of 2012 (i.e., from 1 September 2011 to 1 September 2012); year 1 post-reform is described by Phase 3 in 2012 and Phases 1 and 2 in 2013 (i.e., from 1 September 2012 to 1 September 2013), and so on. The period after September 2015 is excluded from our analysis because following the regional elections held in May, legislative changes were made, broadening the scope of the cover provided to the undocumented population in several of the regions which had been applying the nationwide legislation (Nuño-Solinís, 2016).

The SHB publishes information on health care utilisation, health status and individual satisfaction with the health system in the last twelve months. Regarding utilisation and satisfaction, questions refer to specific components of the health care system, such as GP visits, specialist visits, hospital care in general and emergency care. Satisfaction with health services and satisfaction with specific health care services are reported both by actual and potential users of public health services, on a scale from 1 (very unsatisfied) to 10 (very satisfied). We focus on satisfaction with emergency care services since these are the only services which all undocumented immigrants are entitled to use after the reform. The survey also includes a wide range of socioeconomic information (including age, gender, education, activity status and nationality).

While the primary focus of the reform is health care utilisation, a parameter that can be targeted straightforwardly, the impact of the law on user satisfaction or on health status is less straightforward. A recent study reported a strong correlation between objective and subjective measures of satisfaction with health system responsiveness (Fiorentini et al., 2017). Accordingly, we hypothesise that the 2012 reform may have had a negative effect on the quality of care as perceived by undocumented persons. However, it is also plausible that, in times of restricted access to health care, individual expectations may be lower (Gallo and Gené-Badía, 2013) and thus satisfaction might, in fact, be increased. With respect to health outcomes, access to health services could translate into health behaviour and status improvements via information and advice given by doctors (Courtemanche et al., 2017). On the other hand, access to health insurance could worsen health outcomes by incentivising unhealthy behaviour, either as a result of ex ante moral hazard or arising from pure income effects. Thus, from a theoretical point of view, the impact of the reform, both on health and satisfaction with the system, could go either way.

As in the case of the few previous studies made of undocumented immigrants in this context, information is lacking on the legal status of the individual, a question that is not reported in the SHB survey. Thus, we follow the approach adopted in previous research in this field and assign documented or undocumented status to individuals according to their nationality (Amuedo-Dorantes & Lopez, 2005). In order to decide the nationalities that are most likely to be undocumented in Spain, we follow Gonzalez-Enriquez (2009), who listed the nationalities with the highest proportion of undocumented immigrants in Spain.[5] Unlike the case of other surveys, our data enabled us to identify individuals who possessed double nationality, that is, Spanish nationality in addition to that of their own country. Thus, in our baseline data, the study group is composed of individuals whose nationality corresponds to a country in Africa, Central-South America or Asia and who do not hold double nationality.

Of course, not all individuals with nationality from one of the above countries are undocumented in Spain. Some will have a residence permit and enjoy full legal status. Unfortunately, we cannot assess legal status at the individual level, and must rely

[5] Tables 1A and 2A in the Appendix replicate the table provided in Gonzalez-Enriquez (2009) on the number of total immigrants by nationality as well as the number and percentage of undocumented immigrants by nationality in Spain in 2008.

on an intention-to-treat approach. Therefore, individuals from these countries who are residing legally in Spain will be considered to be addressed by the health care access ban, even if this is not actually the case. In consequence, our estimates represent the lower limit of the true impact of the reform. In the section describing the test of robustness, we explore the sensitivity of the study results to changes in the definition of undocumented immigrant.

4. METHODS

In this study, three econometric strategies are employed to characterise the potential effects of the new health care reform. The outcomes considered are the level of health care utilisation, health status and individual satisfaction with the health care system. We begin by generating a simple Difference in Difference (DD) model in which the treatment group is composed of all undocumented immigrants in Spain before and after the application of the new law. In this first approximation, our aim is to estimate the impact of the policy at the national level on all undocumented immigrants in Spain. Although the reform was in fact implemented differently across regions, the affected population might not be aware of the specificities introduced at the regional level. If this is the case, then for all undocumented immigrants we may observe a reduction in the utilisation of health care. Furthermore, even if the undocumented population were aware that the region in which they lived was not implementing the policy, they might be more afraid of being denounced, prosecuted and possibly deported if they made use of the health care system. This first DD specification can be summarised as follows:

$$Y_{it} = \beta_0 + \beta_1 UI_{it} + \beta_2 Post_t + \beta_3 UI_{it} * Post_t + \beta_4 X_{it} + \delta t + \alpha r + \varepsilon_{it}$$

where UI is a dummy variable identifying whether individual “i” is an undocumented immigrant at time “t”, Post is a dummy variable that takes the value of 1 for the period of the third Survey Phase of 2012 and for subsequent periods. Thus, β_3 identifies the impact of the reform on undocumented immigrants (vis-à-vis Spanish nationals) in the country as a whole. The regression also includes region and time fixed effects (year and

Survey Phase dummies (three phases per year)). Two specifications were obtained for this model: one without covariates (only the time and region fixed effects) and a second one with additional covariates such as age group dummies (18-35 years – the reference category – and 35-45, 45-65, 65-75 and >75 years), dummies for the level of education (no qualification – the reference category, including individuals with less than five years' school education – secondary or pre-university studies and higher education), dummies for activity status (employed – the baseline category – together with unemployed, employed, retired, and other), gender and self-assessed health (in five categories ranging from very good to very bad), only for the health service utilisation and satisfaction outcomes. For the health outcome models, and in view of the low sample sizes available, especially among immigrants reporting bad health, self-reported health was collapsed into two categories: very good and good (assigned the value of 1); and medium, bad and very bad (assigned the value of 0). In all cases, the regression results are presented with and without the individual characteristics as covariates, as some of these characteristics may be endogenous (i.e., also affected by the reform).

As the levels and (potentially) the trends in health care utilisation by undocumented immigrants may differ from those of Spanish nationals (in this respect, studies have highlighted the 'healthy immigrant' effect), a second model was created, containing only the undocumented immigrants in our sample, to examine the differences in health utilisation between undocumented immigrants living in regions that mostly implement the reform (Balearic Islands, Castile-Leon, Castile-La Mancha, Madrid, Murcia and La Rioja) and those living in regions where, in general, the new national regulations are not implemented (see Table 2 for a summary of how the different regions have implemented the reform).

$$Y_{it} = \beta_0 + \beta_1 Treated\,\mathrm{Re}\,gion_{it} + \beta_2 Post_t + \beta_3 Treated\,\mathrm{Re}\,gion_{it} * Post_t + \beta_4 X_{it} + \delta t + \alpha r + \varepsilon_{it}$$

Finally, we also estimate a triple difference model, comparing undocumented immigrants and Spanish nationals, in treated and control regions before and after the policy. This specification allows us to control for any specific unobserved variable that might affect health care utilisation in Spain (in a similar way for undocumented immigrants and Spanish nationals) at the same time than the reform (in 2012).

$$Y_{it} = \beta_0 + \beta_1 UI_{it} + \beta_2 Post_t + \beta_3 UI_{it} * Post_t + \beta_4 Treated\,\mathrm{Re}\,gion_{it} + \beta_5 Treated\,\mathrm{Re}\,gion_{it} * Post_t + \beta_6 Treated\,\mathrm{Re}\,gion_{it} * UI_{it} + \beta_7 UI_{it} * Treated\,\mathrm{Re}\,gion_{it} * Post_t + \beta_8 X_{it} + \delta t + \alpha r + \varepsilon_{it}$$

All estimations are based on linear probability models, and standard errors are clustered at the regional level by wild bootstrap, for the 17 regions. Sampling weights were applied to the sample to make it as representative as possible of the Spanish population.

5. RESULTS

According to the descriptive statistics shown in Table 1, there were no substantial differences in any of the health-related variables between treated and non-treated regions during the study period. In general, undocumented immigrants report fewer visits to health services and are healthier and more satisfied with the health system than are Spanish nationals. Regarding other socioeconomic factors, undocumented immigrants are generally younger, and in both types of regions are more likely to be employed. These features are in line with the 'healthy immigrant' effect, according to which there is a selection effect of immigrants, as a result of which they are in better health than the native population, although the comparative advantage seems to decrease over time (McDonald and Kennedy, 2004; Farré, 2016).

The figures below illustrate the evolution of the main variables reflecting health service utilisation during our sample period, for both undocumented immigrants and the native population. Figure 1 plots the proportion of individuals that visited their GP from 2008 (five years before the implementation of the policy) to 2015 (three years after its implementation). The graphs are not presented for calendar years, but in 12-month periods since the reform was introduced (in the last quarter of 2012). This figure shows that before the policy was introduced the proportion of undocumented immigrants visiting their GP was lower than among the native population (which is in line with the 'healthy immigrant' theory). However, although there are differences in the levels, both graphs follow a similar path. When the reform was introduced in late 2012, there was a sharp fall in the proportion of undocumented immigrants visiting their GP, a pattern that was not paralleled among the native population. Figure 2 plots the same graph for the

probability of using hospital services in a scheduled visit, and the drop after the 2012 reform for the undocumented population is particularly strong for this outcome. Figures 3 and 4 show the changes in the probability of visiting the emergency department and in self-assessed health, respectively. In 2012, the rate of emergency department visits decreased among the undocumented population, while the probability of being in good health also appeared to decrease. Of course, these figures provide only descriptive evidence and cannot be interpreted as causal effects of the policy; clearly, other aspects may have affected the outcomes of interest. In the next part of this analysis, we examine the results of the econometric model, which includes both regional and time fixed effects, as well as controls for individual characteristics in order to isolate the causal impact of the policy on health care utilisation and on user satisfaction.

Regarding the econometric estimations, Tables 3 and 4 show differences in key dependent variables between nationals and undocumented immigrants, before and after the reform, implementing the first DD strategy presented in the previous section. In this first model, our aim is to determine the impact of the new law on undocumented immigrants throughout Spain. Table 3 reports the results obtained for outcomes reflecting health care utilisation, and Table 4 shows the results for variables reflecting, on the one hand, users' satisfaction with the health care sector and, on the other, self-assessed health. According to the findings shown in Table 3, undocumented immigrants in every region became less likely than the native population to report a visit to the GP after the new law came into force. This impact is significant in the models with and without individual covariates, and represents a 5% decrease in the probability of undocumented immigrants visiting their GP as a result of the restrictions on health care access. However, no substantial difference among the two groups was found, for any other health utilisation outcome. Table 4 shows that although most of the coefficients of the impact of the policy are negative, none is statistically significant. Thus, without taking into account inter-regional differences in the implementation of the law, our results show there was a significant drop in the probability of undocumented immigrants' visiting a GP, following the introduction of the new law. However, as explained above, different regions implemented the national law to different extents, which generated another dimension of heterogeneity, an aspect that we discuss below to better identify the effects of the policy.

The second DD model considers only undocumented immigrants, to identify inter-regional differences in the degree of implementation of the reform, thus obtaining a group of treated regions, where the reform was implemented more completely, and a control group, which introduced regional elements to avoid full implementation of the health care access ban. Therefore, we compare utilisation and satisfaction outcomes in treated and control regions before and after the reform, with respect to undocumented immigrants. Tables 5 and 6 report the results obtained for this second model. Table 5 shows that the reform significantly reduced the probability of these immigrants' visiting their GP, or specialist doctor or the hospital (for non-emergency attention). Although all these impacts are statistically significant, the strongest effect observed was for scheduled hospital visits, which fell by approximately 26%, followed by the reduction in specialist doctor visits (about 17%). Visits by undocumented immigrants to the GP fell by 10% in the regions that enforced the ban more strictly. On the other hand, these immigrants became more likely to visit the hospital emergency department, this being one of the exceptions allowed under the new law. Thus, emergency visits increased by 19% following the introduction of the health care access ban. Table 6 shows the results obtained for the variables satisfaction and self-assessed health status. It can be seen that all the coefficients that reflect the impact of the policy are negative, although the only statistically significant coefficient is that for satisfaction with emergency care. In summary, the reform was associated with a fall of 5% in satisfaction with emergency care among undocumented immigrants in the treated regions.

The second model overcomes some of the drawbacks of the first DD model, in which we compared the health care access of undocumented immigrants versus that of the native population. These two very different groups may not access the health care service in the same way, and even if the DD specification eliminated the fixed differences in this respect, concerns would remain about long-term differences between these populations. The second DD model, however, enabled us to compare the same group of individuals, that of undocumented immigrants, and to examine inter-regional differences in implementation of the reform.

Finally, the first two DD models were combined to construct a triple difference model, which took into consideration both the legal status of the individual and the region's degree of compliance with the national law. The results of this analysis are shown in Tables 7 and 8. In fact, the findings obtained are consistent with those of the

second model, suggesting that, in general, undocumented immigrants in Spain became considerably less likely to visit a specialist doctor (by approximately 15%) and to make a scheduled hospital visit (by around 45%). The probability of their making a GP visit also decreased, although in this case the difference was not statistically significant, while the probability of their attending a hospital emergency department rose (as before) but was not significant. With respect to the satisfaction variables, Table 8 shows that, although again all the coefficients are negative, the only variable that was significantly affected was that of satisfaction with the emergency care department, which fell by around 9% following the entry into force of the new regulations.

6. TESTS OF ROBUSTNESS

The validity of the DD estimator relies on the existence of "parallel or common trends". In the case in question, this means that, allowing for initial differences, health status and health care use patterns in the control group should be a valid counterfactual for what would have occurred to health-related outcomes in the treatment group if the reform had not been applied. While on theoretical grounds there is no reason to believe that patterns in the treatment and control groups differed before the 2012 reform, further study is needed to formally test the parallel trends assumption, by means of an event study model. This model includes interactions between pre-reform dummy variables with the treatment group in order to assess the differences in the outcome variables between these two groups in the years before the policy was implemented. Tables 3A and 4A in the Appendix show the results of the event study model considered, for the second model, in which we compare undocumented immigrants in regions that applied a stricter version of the law (the 'treated' regions) with those where alternative regional legislation was introduced to provide access to the health care system to undocumented immigrants. The results of the pre-reform interaction analysis of these dummy variables reveal clear evidence that the parallel trend assumption is met, as none of the coefficients for the pre-reform dummies are significant for the outcomes of probability of visiting the GP, specialist visits, hospital visits, user satisfaction or self-assessed health (Tables A3 and A4). The only outcome for which the parallel trend does not seem to hold is for emergency hospital visits, for which, as shown in Table A3, many of

the pre-reform interaction coefficients are significant. In fact, emergency hospital visits was the only outcome that ceased to be significant in the triple difference specification.

In order to account for potential differential trends in the outcome variables across regions, we next considered the triple difference model with region-specific linear trends. This approach is not relevant in model 1, which does not take into account inter-regional differences, but it does become applicable in the second model and in the triple difference model, where regional differences are included in the analysis to identify the impact of the health care access reform on undocumented immigrants. As shown in Tables A5 and A6, the negative impact of the reform on the probability of specialist visits and hospital visits persists after the inclusion of the region-specific linear trends, and the coefficients for these outcomes remain negative and significant. The coefficient for visits to the GP is also negative but loses significance with respect to the model without region-specific linear trends (Table 5). Similarly, the coefficient for satisfaction with the emergency care system remains strongly negative and significant.

We also tested the robustness of the results, by performing a "placebo" test in which the treated group consisted of persons with double nationality (Spanish plus that of another country in Central-South America, Asia or Africa). These individuals should not be affected by the policy change, as their Spanish nationality would entitle them to access the health care system under the same conditions as any other Spanish citizen. However, by also having a non-European nationality, many of these persons would have health status and health care access routines similar to those of the study group of undocumented immigrants. Accordingly, we believe that this double nationality group constitutes a good basis for a placebo experiment. Tables 7A and 8A show the results obtained for the health care access and user satisfaction variables for the triple difference model. As expected, none of the triple interaction coefficients are significant. Again, this reinforces the causal interpretation of our baseline results.

Of course, the health care access reform implemented in 2012 by the Spanish government only affected the public health care system and undocumented immigrants retained the option of a private GP visit or seeking treatment at a private hospital if they were willing to pay the price. It is important to note that the private health care system is not as developed in Spain as in other countries: for example, as reported in the SHB survey, only about 11% of Spanish citizens who reported having visited a GP did so

with a private doctor. Similarly, only about 6% of the undocumented immigrants studied had visited a private GP in the last year. Thus, we believe that the distinction between the public and private health care systems is not very relevant to the results presented. Nevertheless, Table 9A shows that the triple difference model (Model 3) achieved the same results as in our baseline model after excluding visits to private doctors/clinics. Thus, the main effects remained unchanged with respect to specialist and hospital visits, and the negative coefficients became significant for the probability of visiting the GP when private GP visits were excluded. Therefore, these new tests provide additional evidence of the robustness of our conclusions regarding the impact of the health care access reform.

Finally, some additional estimations were performed in which the definition of undocumented immigrant was varied: 1) including citizens from Central-South America, Africa, Asia and Eastern Europe; 2) including citizens from Central-South America, Africa and Asia (our definition in the baseline regressions) 3) including citizens from Central-South America and Africa; 4) including citizens only from Central-South America.

Figures 1A and 2A present the point estimates and confidence intervals obtained for each of the health care access and satisfaction outcomes for the above four definitions, corresponding to the estimates for the triple difference model (Model 3). These figures show that both the point estimates and the significance levels remain fairly stable across the different definitions of undocumented immigrant, although the results for the sample including only citizens from Central and South America show stronger negative coefficients for hospital and specialist visits.

7. CONCLUSIONS

In this study, we examine the effects of a 2012 legal reform that greatly restricted access to the health care system for undocumented immigrants in Spain. We evaluate the effect of this reform on several indicators of healthcare utilisation, on the level of satisfaction with the health system and on self-assessed health status, using three difference-in-difference specifications.

In the first stage of this analysis, we considered the effects of the reform on all undocumented immigrants in Spain vis-à-vis the unaffected native population. Then, we restricted the sample to undocumented immigrants in order to take into account inter-regional differences in the degree of implementation of the national law. Finally, these two strategies were combined in order to estimate a triple difference model comparing undocumented immigrants (versus the native population) in more intensively-treated regions before and after the implementation of the reform. According to our results, restricting access to the health care system for undocumented immigrants in Spain reduced the probability of their visiting a specialist doctor (by 15%) and the probability of their making a scheduled hospital visit (by 45%). The probability of their visiting the GP was also negatively affected, but the difference was not statistically significant. With respect to the variables of user satisfaction, although all the coefficients were negative, the only significant one was satisfaction with the emergency care department, which fell by 8.8% following the reform.

Although no significant effects were detected on self-reported health status in the first three years after the implementation of the reform, denying access to the health care system to undocumented migrants may result in non-negligible health impacts in the near future, according to the decrease in health care utilisation reported in this paper. In addition, the lack of access to preventive services may impose huge costs on society at large, given the negative externalities generated by contagious diseases, for instance, which cannot be evaluated from the database used in this study. Finally, restricting access to services according to nationality usually requires complex administration and is resisted by many health professionals, who have declared themselves opposed to this initiative (Nuño-Solinís, 2016).

Additionally, our findings show that restrictions on the health care cover available to undocumented immigrants are reflected in lower levels of self-reported satisfaction with the emergency care department. We believe our results reinforce those of Fiorentini et al. (2017), who recorded a strong association between subjective and objective measures of health care satisfaction. Therefore, we corroborate previous findings that patients' self-reported measures can be considered valid predictors of more objective measures of responsiveness and could be used as tools to evaluate the performance of health systems.

As a final point, the results of this study should be taken into account by Spanish health authorities and policy makers in other countries that are considering introducing restrictions on access to health services for the immigrant population. These findings are also of relevance for the United Kingdom, which on 6 April 2015 introduced an up-front surcharge to access NHS hospitals for people from outside the European Economic Area, claiming this would produce savings on NHS resources and deter health tourism.

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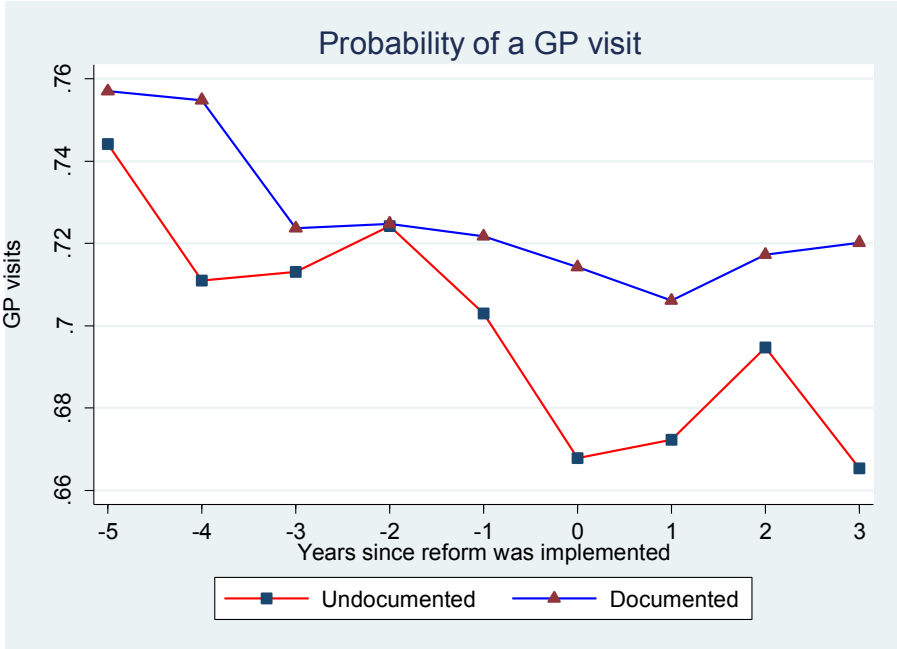
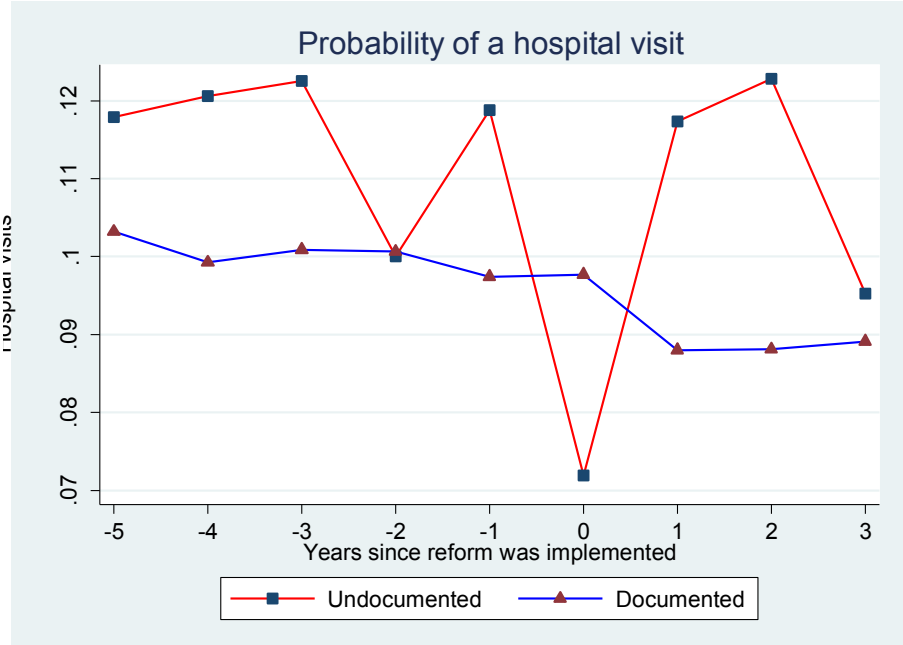
FIGURES

Figure 1. Probability of a GP visit



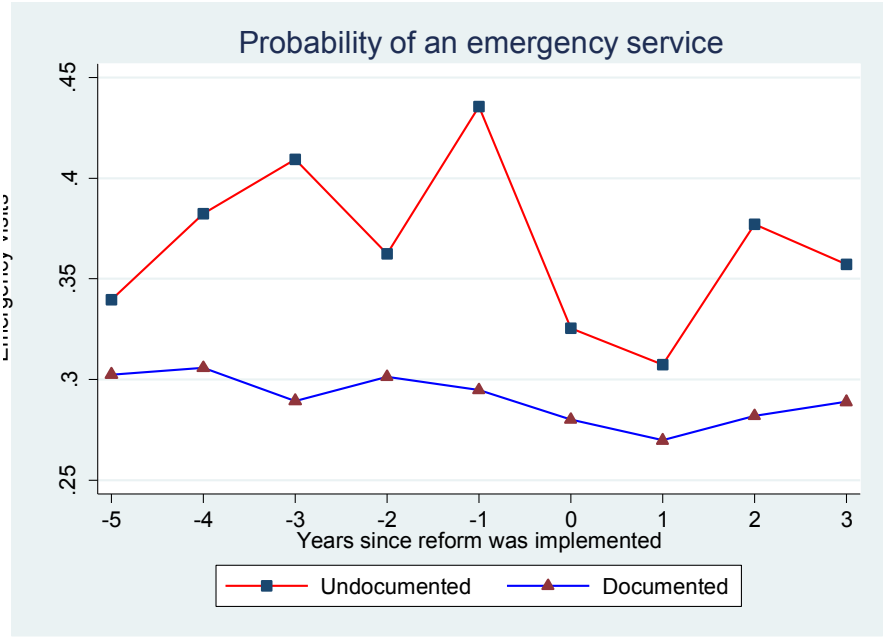
Note: Year 0 = 1 September 2012; Year 1 = 1 September 2013; Year 2 = 1 September 2014; Year 3 = 1 September 2015; Year -1 = 1 September 2011; Year -2 = 1 September 2010; Year -3 = 1 September 2009; Year 4 = 1 September 2008; Year -5 = 1 September 2007.

Figure 2. Probability of a hospital visit



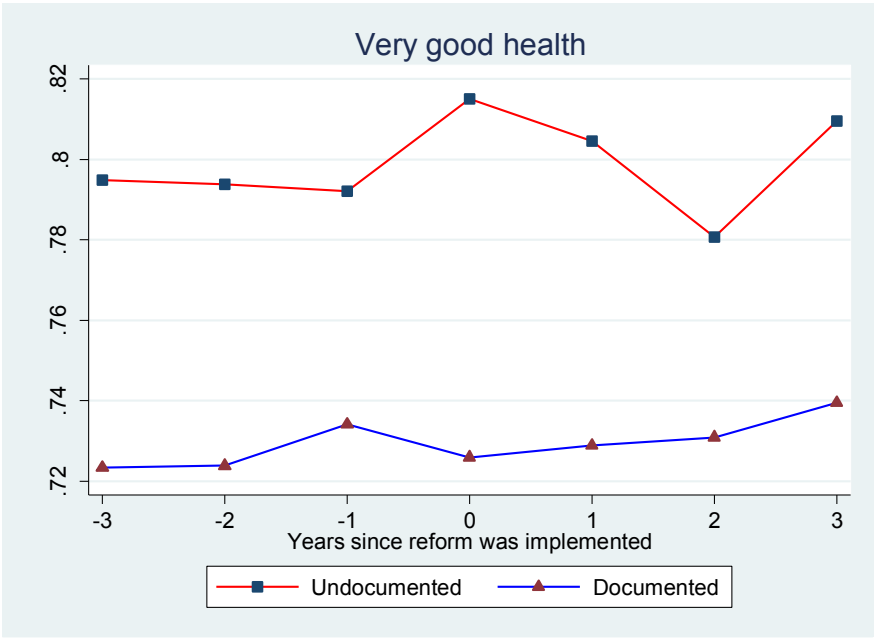
Note: Year 0 = 1 September 2012; Year 1 = 1 September 2013; Year 2 = 1 September 2014; Year 3 = 1 September 2015; Year -1 = 1 September 2011; Year -2 = 1 September 2010; Year -3 = 1 September 2009; Year 4 = 1 September 2008; Year -5 = 1 September 2007.

Figure 3. Probability of a visit to hospital emergency services.



Note: Year 0 = 1 September 2012; Year 1 = 1 September 2013; Year 2 = 1 September 2014; Year 3 = 1 September 2015; Year -1 = 1 September 2011; Year -2 = 1 September 2010; Year -3 = 1 September 2009; Year 4 = 1 September 2008; Year -5 = 1 September 2007.

Figure 4. Self-assessed health.



Note: Year 0 = 1 September 2012; Year 1 = 1 September 2013; Year 2 = 1 September 2014; Year 3 = 1 September 2015; Year -1 = 1 September 2011; Year -2 = 1 September 2010; Year -3 = 1 September 2009; Year 4 = 1 September 2008; Year -5 = 1 September 2007.

TABLES

Table 1. Descriptive statistics (2008-2015)

	Control regions		Treated regions	
Use variables	**Documented**	**Undocumented**	**Documented**	**Undocumented**
Prob. GP visit	.7321502	.6968291	.7139143	.7057026
Prob. specialist visits	.4607109	.3261206	.4756175	.3289206
Prob. hospital visit	.094543	.0986893	.0987615	.1217039
Prob. emergency visits	.2955306	.3577487	.2791359	.3762677
Satisfaction variables				
With health system	6,414825	7,150973	6,495192	7,298047
With emergency care	6,11384	6,546455	6,026606	6,68239
Health and socioeconomic variables				
Very good health	.7252074	.7870472	.7382323	.8158273
Employed	.4160691	.5092593	.4431588	.5192698
Unemployed	.1785	.3410494	.1523773	.3478702
Retired	.2605501	.0192901	.2429186	.0121704
Other activity	.1425885	.1242284	.1555387	.1176471
18-35 years old	.2600235	.5439137	.2628355	.5649087
35-45 years old	.1938069	.3004622	.1953268	.2596349
45-65 years old	.2094511	.0138675	.21042	.0111562
65-75 years old	.1266804	.0107858	.1239027	.0081136
> 75 years old	.1026123	.0030817	.1059046	.0030426
No studies	.025197	.0092593	.0221435	.0142712
Primary education	.229566	.1512346	.2196634	.1610601
Secondary education	.5236387	.6743827	.5124004	.6472987
University	.1704986	.1427469	.2022017	.1457696
Female	0.4901	0.4859	0.4890	.4837728
Male	.4908424	.5069337	.4967477	.5162272

Table 2. Reaction of different ACs to the national reform

Regions that applied alternative health programmes for undocumented immigrants	Regions that applied the national law barring access to health care for undocumented immigrants			
	With exceptions			Without exceptions
	Chronic disease	Mental illness	Public health risk	
Andalusia (2013) Asturias (2012) Aragón (2013) Canary Islands (2013) Cantabria (2013) Catalonia (2012) Basque Country (2012) Extremadura (2013) Galicia (2012) Valencia (2013) Navarre (2013)	Madrid (2012) Murcia (2012)	Madrid (2012) Balearic Islands (2012) Rioja	Madrid (2012) Castile - León Balearic Islands (2012) La Rioja	Castile - La Mancha

Source: The authors

Table 3. Difference-in-Differences: health care utilisation variables. Impact on undocumented immigrants in all Spanish regions.

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Undocumented	-0.019*	0.018	-0.174***	-0.114**	0.010	0.019	0.073***	0.070***
Immigrant	(0.010)	(0.011)	(0.068)	(0.044)	(0.018)	(0.012)	(0.000)	(0.000)
After	-0.035***	-0.043***	-0.034***	-0.036***	-0.014*	-0.014**	-0.012	-0.016
	(0.014)	(0.017)	(0.013)	(0.014)	(0.008)	(0.007)	(0.010)	(0.012)
Undocumented*After	-0.031**	-0.034**	0.028	0.023	0.007	0.011	-0.008	-0.001
	(0.013)	(0.017)	(0.021)	(0.022)	(0.014)	(0.013)	(0.030)	(0.101)
Constant	0.751***	0.670***	0.414***	0.265***	0.095***	0.086***	0.346***	0.324***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X	X	X
Individual covariates		X		X		X		X
Pre-reform mean	0.712	0.712	0.482	0.482	0.103	0.103	0.301	0.301
% Impact of the policy	4.3%	4.8%						
Observations	51,965	51,812	51,994	51,840	52,157	52,002	52,168	52,013
R-squared	0.005	0.043	0.015	0.054	0.001	0.012	0.007	0.012

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Difference-in-Differences: satisfaction and self-assessed health variables. Impact on undocumented immigrants in all Spanish regions.

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Undocumented	0.817***	1.040***	0.516**	0.743***	0.063***	-0.002
Immigrant	(0.000)	(0.000)	(0.263)	(0.000)	(0.000)	(0.014)
After	0.246***	0.126	0.212***	-0.044	0.006	0.001
	(0.000)	(0.083)	(0.000)	(0.132)	(0.010)	(0.006)
Undocumented*After	-0.018	-0.027	-0.003	0.001	-0.017	-0.017
	(0.118)	(0.145)	(0.071)	(0.000)	(0.023)	(0.018)
Constant	6.189***	6.153***	5.545***	5.728***	0.730***	0.624***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X
Individual covariates		X		X		X
Pre-reform mean	6.716	6.716	6.065	6.065	0.747	0.747
% Impact of the policy						
Observations	51,768	51,613	36,252	36,058	38,728	38,612
R-squared	0.033	0.087	0.025	0.062	0.005	0.155

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Difference-in-Differences: health care utilisation variables. Undocumented immigrants in treated and control regions.

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Undocumented	0.035***	0.051***	0.025*	0.009	-0.016**	-0.021***	-0.058***	-0.060**
Immigrant	(0.014)	(0.000)	(0.014)	(0.011)	(0.007)	(0.008)	(0.022)	(0.028)
After	-0.047	-0.043	0.045	-0.004	0.012	0.000	-0.029	-0.031
	(0.047)	(0.028)	(0.039)	(0.024)	(0.018)	(0.007)	(0.039)	(0.044)
Undocumented*After	-0.073*	-0.080*	-0.071**	-0.066**	-0.041*	-0.035*	0.083*	0.082*
	(0.043)	(0.044)	(0.027)	(0.026)	(0.021)	(0.018)	(0.046)	(0.047)
Constant	0.664***	0.445***	0.191***	-0.052	0.047***	-0.042	0.417***	0.302***
	(0.000)	(0.000)	(0.000)	(0.062)	(0.000)	(0.033)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X	X	X
Individual covariates		X		X		X		X
Pre-reform mean	0.742	0.742	0.391	0.391	0.133	0.133	0.423	0.423
% Impact of the policy	9.8%	10.7%	18.1%	16.8%	30.8%	26.3%	19.6%	19.3%
Observations	2,275	2,266	2,276	2,267	2,283	2,274	2,283	2,274
R-squared	0.013	0.051	0.016	0.079	0.020	0.054	0.010	0.029

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

Table 6. Difference in Differences Satisfaction and self-assessed health variables. Sample of undocumented immigrants only in treated and control regions.

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Undocumented	0.325***	0.375***	-0.486***	-0.412***	-0.005	-0.037**
Immigrant	(0.000)	(0.000)	(0.188)	(0.160)	(0.009)	(0.014)
After	0.062	0.031	0.659***	0.517***	0.038	-0.014
	(1.640)	(2.498)	(0.000)	(0.000)	(0.032)	(0.030)
Undocumented*After	-0.163	-0.178	-0.337**	-0.346***	-0.024	-0.018
	(0.221)	(0.199)	(0.145)	(0.134)	(0.037)	(0.033)
Constant	7.176***	7.653***	6.875***	7.188***	0.801***	0.721***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X
Individual covariates		X		X		X
Pre-reform mean	7.467	7.467	6.826	6.826	0.809	0.809
% Impact of the policy			5%	5%		
Observations	2,258	2,249	1,454	1,447	1,606	1,597
R-squared	0.033	0.046	0.063	0.090	0.019	0.056

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

Table 7. Triple Differences Model. Utilisation variables.

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Undocumented	-0.032**	0.003	-0.179**	-0.125***	-0.006	0.008	0.071***	0.069***
	(0.013)	(0.016)	(0.069)	(0.049)	(0.006)	(0.007)	(0.000)	(0.000)
Treated region	-0.016*	-0.013*	0.097***	0.053***	0.035***	0.034***	-0.115**	-0.109***
	(0.009)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)	(0.044)	(0.042)
After	-0.029**	-0.045***	-0.033***	-0.036***	-0.016**	-0.017**	-0.015*	-0.017**
	(0.011)	(0.018)	(0.013)	(0.014)	(0.007)	(0.008)	(0.008)	(0.007)
Treated region*	-0.021	-0.020	-0.005	-0.002	0.005	0.006	0.010	0.010
After	(0.020)	(0.020)	(0.006)	(0.006)	(0.009)	(0.009)	(0.025)	(0.024)
Treated region*	0.031	0.025	0.012	0.010	0.042**	0.038*	0.006	0.002
Undocumented	(0.023)	(0.023)	(0.024)	(0.022)	(0.021)	(0.020)	(0.019)	(0.019)
Undocumented*	-0.007	-0.012	0.055***	0.046***	0.027**	0.026**	-0.035	-0.038
After	(0.033)	(0.023)	(0.000)	(0.000)	(0.013)	(0.013)	(0.049)	(0.044)
Treated region* Undocumented* After	-0.055	-0.059	-0.070**	-0.072***	-0.049**	-0.047**	0.070	0.071
	(0.057)	(0.052)	(0.027)	(0.028)	(0.023)	(0.022)	(0.051)	(0.052)
Constant	0.749***	0.681***	0.413***	0.272***	0.096***	0.092***	0.347***	0.338***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X	X	X
Individual covariates		X		X		X		X
Pre-reform mean	0.712	0.712	0.482	0.482	0.103	0.103	0.301	0.301
% Impact of the policy			14.5%	15%	47.5%	45.6%		
Observations	51,965	51,812	51,994	51,840	52,157	52,002	52,168	52,013
R-squared	0.005	0.041	0.015	0.056	0.002	0.012	0.007	0.012

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Triple Differences Model. Satisfaction and self-assessed health variables.

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Undocumented	0.755***	0.986***	0.311	0.540*	0.052***	-0.015
	(0.000)	(0.000)	(0.271)	(0.287)	(0.020)	(0.020)
Treated region	0.403***	0.354***	0.554***	-0.140	0.049***	0.041***
	(0.000)	(0.137)	(0.000)	(0.105)	(0.000)	(0.000)
After	0.269**	0.274**	0.167**	-0.090	0.007	0.004
	(0.124)	(0.126)	(0.077)	(0.109)	(0.010)	(0.010)
Treated region *	-0.080	-0.074	0.166	0.165	-0.006	-0.009
After	(0.153)	(0.154)	(0.189)	(0.188)	(0.009)	(0.007)
Treated region *	0.147	0.147	0.530*	0.528*	0.026	0.032
Undocumented	(0.102)	(0.100)	(0.282)	(0.269)	(0.018)	(0.025)
Undocumented*	0.021	0.029	0.197	0.202	-0.008	-0.011
After	(0.105)	(0.110)	(0.175)	(0.176)	(0.023)	(0.019)
Treated region * Undocumented*	-0.074	-0.097	-0.532**	-0.539**	-0.018	-0.011
After	(0.163)	(0.125)	(0.259)	(0.248)	(0.030)	(0.022)
Constant	6.181***	6.111***	5.571***	5.751***	0.730***	0.622***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & time FE	X	X	X	X	X	X
Individual covariates		X		X		X
Pre-reform mean	6.716	6.716	6.065	6.065	0.747	0.747
% Impact of the policy			8.7%	8.8%		
Observations	51,768	51,613	36,252	36,058	38,728	38,612
R-squared	0.033	0.077	0.025	0.063	0.005	0.155

FE = Fixed effects; Note: Standard errors are clustered at the regional level with wild-bootstrap. Individual covariates include dummies for labour market status, age groups, highest level of education, gender and self-assessed health.

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX:

Table 1A. Main origins of foreign-born population in Spain 2008 (thousands)

Romania	704.2
Morocco	676.4
Ecuador	451.1
Colombia	326.5
United Kingdom	357.2
Argentina	287.8
Bolivia	238.6
Germany	237.1
France	219.5
Peru	160.6
Bulgaria	150.5
Venezuela	142.7
Brazil	140.9
Portugal	135.3
China	125.3
Dominican Rep.	113.7

Note: Taken from Gonzalez-Enriquez 2009. Data from the Spanish National Institute of Statistics. "Padron municipal de habitants" [Municipal register of inhabitants]. The data refer to persons registered in the municipalities on the first day of each year.

Table 2A. Main origins of undocumented population (thousands). January 2008.

Country of Nationality	By municipal register (A)	By residence permit (B)	Undocumented = A-B	% undocumented
Bolivia	234	69	165	70
Argentina	195	96	99	51
Brazil	118	39	79	67
Paraguay	66	14	52	79
Uruguay	61	31	30	49
Venezuela	60	33	27	45
Colombia	280	254	26	9
Russia	44	30	14	32
Chile	48	25	13	27
Ukraine	74	62	12	16
Ecuador	408	396	12	3
Pakistan	46	36	10	22
Senegal	43	33	10	23
Cuba	52	45	7	13
Peru	122	116	6	5
Dominican Rep.	76	71	5	7
Algeria	49	46	3	6

Note: Taken from Gonzalez-Enriquez 2009. National Institute of Statistics, Municipal Register and Permanent Immigration Observatory.

Note: The table only includes groups with a population size >30,000 persons. Undocumented status among Moroccan and Chinese immigrants is, according to these sources, non existent as the number of those on the Municipal Register is lower than that of residence permits issued.

Table 3A. Estimations with pre-reform dummies. Utilisation variables

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Treated region	0.067	0.088*	0.032	-0.001	-0.064	-0.075*	-0.181***	-0.177***
	(0.041)	(0.045)	(0.034)	(0.030)	(0.037)	(0.039)	(0.049)	(0.052)
Treated*4yearsbefore	-0.078	-0.106	-0.095	-0.098	0.056	0.059	0.109	0.100
	(0.065)	(0.067)	(0.069)	(0.070)	(0.048)	(0.053)	(0.067)	(0.063)
Treated*3yearsbefore	0.041	0.060	0.019	0.058	0.048	0.069*	0.151*	0.157*
	(0.042)	(0.043)	(0.046)	(0.043)	(0.036)	(0.039)	(0.075)	(0.079)
Treated*2yearsbefore	-0.064	-0.068	0.008	0.028	0.066	0.070	0.167***	0.152**
	(0.070)	(0.071)	(0.067)	(0.052)	(0.042)	(0.048)	(0.054)	(0.053)
Treated*1yearbefore	-0.066	-0.079	0.015	0.028	0.051	0.044	0.139**	0.119*
	(0.061)	(0.059)	(0.042)	(0.037)	(0.059)	(0.056)	(0.065)	(0.063)
Treated*After	-0.106**	-0.118**	-0.082*	-0.062	0.007	0.018	0.207***	0.198**
	(0.049)	(0.049)	(0.042)	(0.040)	(0.039)	(0.040)	(0.064)	(0.072)
Constant	0.652***	0.429***	0.187***	-0.056	0.063***	-0.023	0.459***	0.340***
	(0.034)	(0.052)	(0.028)	(0.059)	(0.015)	(0.023)	(0.028)	(0.067)
Region & Time FE	X	X	X	X	X	X	X	X
Individual covariates		X		X		X		X
Observations	2,275	2,266	2,276	2,267	2,283	2,274	2,283	2,274
R-squared	0.015	0.054	0.017	0.081	0.021	0.055	0.011	0.031

Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Table 4A. Estimations with pre-reform dummies. Health and satisfaction variables

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Treated region	0.057	0.096	-0.561**	-0.609**	-0.055	-0.083
	(0.251)	(0.234)	(0.221)	(0.270)	(0.043)	(0.048)
Treated*4yearsbefore	0.275	0.234				
	(0.385)	(0.376)				
Treated*3yearsbefore	0.330	0.315				
	(0.282)	(0.249)				
Treated*2yearsbefore	0.374	0.463	0.346	0.516	0.093	0.078
	(0.324)	(0.312)	(0.412)	(0.460)	(0.084)	(0.090)
Treated*1yearbefore	0.269	0.276	-0.152	0.019	0.048	0.049
	(0.196)	(0.190)	(0.204)	(0.237)	(0.060)	(0.070)
Treated*After	0.110	0.102	-0.262	-0.151	0.027	0.028
	(0.335)	(0.323)	(0.235)	(0.246)	(0.043)	(0.056)
Constant	7.268***	7.746***	6.903***	7.294***	0.823***	0.743***
	(0.243)	(0.310)	(0.078)	(0.551)	(0.041)	(0.118)
Region & Time FE	X	X	X	X	X	X
Individual Covariates		X		X		X
Observations	2,258	2,249	1,454	1,447	1,606	1,597
R-squared	0.034	0.047	0.064	0.091	0.020	0.057

Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Table 5A. Estimations with region-specific trends. Utilisation variables. Triple difference model

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Undocumented	-0.034**	0.002	-0.178**	-0.125***	-0.006	0.008	0.072***	0.070***
	(0.013)	(0.018)	(0.069)	(0.048)	(0.006)	(0.007)	(0.000)	(0.000)
Treated region	-0.061**	-0.057**	0.079***	0.047***	0.047***	0.048***	-0.160***	-0.150**
	(0.024)	(0.022)	(0.000)	(0.000)	(0.000)	(0.000)	(0.062)	(0.058)
After	-0.010	-0.030***	-0.037**	-0.046***	-0.012*	-0.011*	-0.054**	-0.056**
	(0.006)	(0.012)	(0.014)	(0.018)	(0.006)	(0.006)	(0.021)	(0.022)
Treated region*	-0.034	-0.032	-0.042*	-0.039*	0.017***	0.019***	-0.003	0.000
After	(0.029)	(0.028)	(0.024)	(0.022)	(0.000)	(0.000)	(0.035)	(0.006)
Treated region*	0.033	0.028	0.013	0.011	0.042*	0.038*	0.008	0.004
Undocumented	(0.024)	(0.023)	(0.024)	(0.024)	(0.023)	(0.021)	(0.017)	(0.018)
Undocumented*	-0.003	-0.008	0.052***	0.043***	0.026**	0.025**	-0.040	-0.042
After	(0.028)	(0.029)	(0.000)	(0.000)	(0.013)	(0.012)	(0.046)	(0.045)
Treated region*	-0.058	-0.064	-0.071**	-0.073**	-0.051**	-0.050**	0.066	0.067
Undocumented*	(0.063)	(0.059)	(0.028)	(0.028)	(0.024)	(0.023)	(0.052)	(0.051)
Constant	0.740***	0.672***	0.419***	0.278***	0.094***	0.089***	0.357***	0.347***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & Time FE	X	X	X	X	X	X	X	X
Individual Covariates		X		X		X		X
Observations	51,965	51,812	51,994	51,840	52,157	52,002	52,168	52,013
R-squared	0.006	0.041	0.015	0.056	0.002	0.012	0.008	0.012

Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Table 6A. Estimations with region-specific trends. Health and satisfaction variables. Triple difference model

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Undocumented	0.741***	0.972***	0.326	0.553**	0.050*	-0.016
	(0.000)	(0.000)	(0.277)	(0.269)	(0.026)	(0.021)
Treated region	0.494***	0.462***	0.297***	0.107**	0.039***	0.038***
	(0.000)	(0.000)	(0.000)	(0.052)	(0.000)	(0.000)
After	0.320***	0.325***	0.120**	-0.201***	0.001	-0.011
	(0.000)	(0.000)	(0.058)	(0.078)	(0.012)	(0.011)
Treated region*	-0.233	-0.226	-0.075	-0.050	-0.001	-0.006
After	(0.182)	(0.161)	(0.085)	(0.095)	(0.000)	(0.035)
Treated region*	0.198**	0.198**	0.584**	0.581**	0.028	0.033
Undocumented	(0.091)	(0.091)	(0.284)	(0.283)	(0.021)	(0.027)
Undocumented*	0.047	0.056	0.167	0.173	-0.006	-0.011
After	(0.118)	(0.116)	(0.190)	(0.202)	(0.022)	(0.022)
Treated region*	-0.182	-0.204*	-0.609**	-0.614**	-0.021	-0.011
Undocumented*	(0.114)	(0.112)	(0.236)	(0.238)	(0.033)	(0.024)
Constant	6.159***	6.088***	5.626***	5.796***	0.735***	0.633***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & Time FE	X	X	X	X	X	X
Individual Covariates		X		X		X
Observations	51,768	51,613	36,252	36,058	38,728	38,612
R-squared	0.036	0.079	0.028	0.065	0.005	0.156

Wild-bootstrap robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

FE= Fixed Effects

Table 7A. Estimates for double nationality citizens (Placebo test). Utilisation variables. Triple difference model

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Double Nationality	0.071	0.085	0.017	0.028	0.000	0.009	0.053*	0.046
	(0.053)	(0.058)	(0.043)	(0.046)	(0.000)	(0.037)	(0.031)	(0.029)
Treated region	-0.060***	-0.011	0.072***	0.053***	0.039***	0.009**	0.006	-0.112**
	(0.023)	(0.007)	(0.000)	(0.000)	(0.000)	(0.004)	(0.008)	(0.044)
After	-0.042***	-0.029**	-0.035**	-0.036**	-0.015**	-0.017**	-0.043***	-0.021***
	(0.016)	(0.011)	(0.015)	(0.014)	(0.006)	(0.006)	(0.017)	(0.008)
Treated region*	-0.021	-0.020	-0.005	-0.002	0.005	0.006	0.010	0.010
After	(0.019)	(0.020)	(0.007)	(0.006)	(0.009)	(0.009)	(0.021)	(0.021)
Treated region*	-0.013	0.003	-0.099	-0.079	0.006	0.006	-0.000	0.004
Double nationality	(0.032)	(0.073)	(0.064)	(0.055)	(0.034)	(0.032)	(0.001)	(0.173)
Double nationality*	-0.045	-0.031	0.034	0.055	0.020	0.022	0.023	0.025
After	(0.033)	(0.036)	(0.060)	(0.077)	(0.041)	(0.038)	(0.053)	(0.053)
Treated region* Double nationality* After	-0.004	-0.032	0.072	0.051	-0.059	-0.061	-0.016	-0.020
	(0.055)	(0.048)	(0.093)	(0.074)	(0.054)	(0.053)	(0.045)	(0.051)
Constant	0.748***	0.684***	0.416***	0.277***	0.096***	0.096***	0.349***	0.342***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & Time FE	X	X	X	X	X	X	X	X
Individual Covariates		X		X		X		X
Observations	50,623	50,476	50,650	50,502	50,809	50,660	50,819	50,670
R-squared	0.005	0.041	0.012	0.053	0.001	0.012	0.007	0.011

Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Table 8A. Estimates for double nationality citizens (Placebo test). Health and satisfaction variables. Triple difference model

	Satisf. Health Serv.	Satisf. Health Serv.	Satisf. Emerg. Care	Satisf. Emerg. Care	Self-Assessed Health	Self-Assessed Health
Double nationality	0.492***	0.683***	0.357***	0.530***	0.065**	0.000
	(0.000)	(0.000)	(0.139)	(0.000)	(0.032)	(0.000)
Treated region	0.407***	0.019	0.569***	-0.135	0.011**	-0.010**
	(0.000)	(0.090)	(0.000)	(0.115)	(0.004)	(0.004)
After	0.280***	0.287**	0.177***	0.042	0.007	0.003
	(0.109)	(0.111)	(0.069)	(0.064)	(0.013)	(0.008)
Treated region*	-0.080	-0.074	0.165	0.165	-0.007	-0.009
After	(0.176)	(0.168)	(0.181)	(0.177)	(0.010)	(0.008)
Treated region*	0.307**	0.306**	-0.063	-0.095	0.012	0.006
Double nationality	(0.150)	(0.119)	(0.170)	(0.192)	(0.047)	(0.071)
Double nationality*	-0.129	-0.108	0.051	0.072	0.013	0.002
After	(0.275)	(0.232)	(0.174)	(0.192)	(0.036)	(0.125)
Treated region* Double nationality* After	-0.186	-0.156	-0.295*	-0.248	-0.039	-0.006
	(0.319)	(0.282)	(0.174)	(0.229)	(0.059)	(0.083)
Constant	6.175***	6.097***	5.563***	5.742***	0.728***	0.619***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & Time FE	X	X	X	X	X	X
Individual covariates		X		X		X
Observations	50,440	50,291	35,515	35,323	37,901	37,791
R-squared	0.028	0.073	0.024	0.062	0.005	0.158

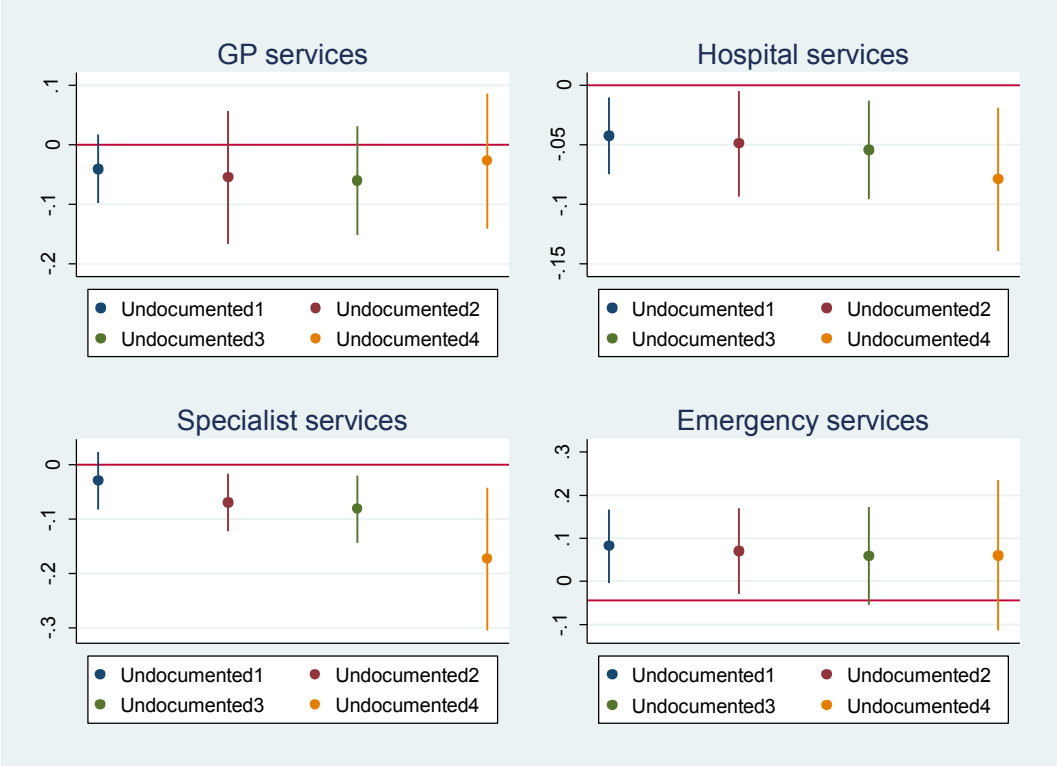
Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Table 9A. Estimates for visits to public providers only. Triple difference model

	GP	GP	Specialist visits	Specialist visits	Hospital visits	Hospital visits	Hosp. Emergency visits	Hosp. Emergency visits
Undocumented	-0.008	0.020	-0.110***	-0.066***	0.004	0.017	0.082***	0.079***
	(0.020)	(0.017)	(0.043)	(0.026)	(0.008)	(0.011)	(0.000)	(0.000)
Treated region	-0.054***	-0.028***	0.065***	0.016***	0.009**	0.014***	-0.106**	-0.021**
	(0.021)	(0.011)	(0.000)	(0.000)	(0.004)	(0.000)	(0.041)	(0.010)
After	-0.027**	-0.028**	-0.025*	-0.017	-0.014*	-0.015*	-0.021**	-0.045**
	(0.010)	(0.013)	(0.014)	(0.012)	(0.008)	(0.008)	(0.010)	(0.018)
Treated region*	-0.012	-0.012	-0.009	-0.007	0.005	0.006	0.015	0.014
After	(0.016)	(0.016)	(0.006)	(0.008)	(0.007)	(0.007)	(0.017)	(0.018)
Treated region*	0.054***	0.044*	0.041**	0.032*	0.047	0.042	0.017	0.010
Undocumented	(0.)	(0.024)	(0.016)	(0.017)	(0.030)	(0.027)	(0.019)	(0.019)
Undocumented*	-0.007	-0.011	0.052***	0.046***	0.030***	0.029***	-0.036	-0.039
After	(0.024)	(0.019)	(0.000)	(0.018)	(0.000)	(0.000)	(0.037)	(0.035)
Treated region* Undocumented*	-0.083	-0.086*	-0.097**	-0.097**	-0.054***	-0.051**	0.052	0.055
After	(0.050)	(0.052)	(0.038)	(0.038)	(0.021)	(0.022)	(0.046)	(0.044)
Constant	0.705***	0.678***	0.343***	0.279***	0.085***	0.095***	0.325***	0.336***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region & Time FE	X	X	X	X	X	X	X	X
Individual covariates		X		X		X		X
Observations	52,107	51,954	52,082	51,928	52,172	52,017	52,177	52,022
R-squared	0.004	0.044	0.006	0.045	0.002	0.014	0.007	0.013

Wild-bootstrap robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
FE= Fixed Effects

Figure 1A. Alternative definitions of undocumented immigrants. Utilisation variables.



Note. Undocumented1: Citizens from Central-South America, Africa, Asia or Eastern Europe; Undocumented2: Citizens from Central-South America, Africa or Asia; Undocumented3: Citizens from Central-South America or Africa; Undocumented4: Citizens from Central-South America. Estimates from the triple difference model.

Figure 2A. Alternative definitions of undocumented immigrants. Satisfaction and health variables.

Note. Undocumented1: Citizens from Central-South America, Africa, Asia or Eastern Europe; Undocumented2: Citizens from Central-South America, Africa or Asia; Undocumented3: Citizens from Central-South America or Africa; Undocumented4: Citizens from Central-South America. Estimates from the triple difference model.

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