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ABSTRACT

New Evidence on the Healthy Immigrant Effect*

This paper provides new empirical evidence on the contribution of selective migration to the health advantage of immigrants upon arrival to the new destination (i.e. the *Healthy Immigrant Effect*). It analyses a very interesting episode in international migration, namely the exodus of Ecuadorians in the aftermath of the economic collapse in the late 1990s. Between 1999 and 2005, more than 600,000 Ecuadorians left the country and most of them headed towards Spain. Using administrative data from the Vital Statistics, it compares the health distribution (in terms of birth outcomes) of immigrant children born in Spain to that of non-immigrants in Ecuador and immigrants from other nationalities, and not only to that of natives at destination. These comparisons suggest that positive selection is partly responsible for the health advantage of recent immigrants.

JEL Classification: J61, I14, C14

Keywords: immigration, selection, health, birth outcomes

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I. Introduction

Questions about the characteristics of those who migrate remain fundamental in immigration research. To evaluate the costs and benefits of population movements, immigrants are compared to non-immigrant in the source country and the native population at destination in many different dimensions (e.g. education, age, risk and entrepreneurial attitudes or health).

The health of immigrants is an issue of concern. Some critical voices argue that migration may represent a burden to the public health system at destination financed mainly by natives. The health of immigrants may also be a relevant factor for their integration and assimilation process. For the sending country, the characteristics of those who leave may as well have implications at the aggregate level in terms of, for instance, health and inequality.

A well established regularity is that new immigrants to developed countries such as the US, Canada, and Australia enjoy significant health advantages relative to comparable native-born individuals in these countries.[1] This is known in the literature as the *healthy immigrant effect* (HIE). The HIE is present among most immigrant groups, even though a large majority come from developing countries with worse life expectancy indicators. There is also evidence that the gap does not respond to socioeconomic differences in terms of education and income as most recent immigrants fall behind the native population in these dimensions.

The literature has highlighted at least three explanations to account for the health advantage of recent immigrants. First, the better health of immigrants may respond to healthier diets, habits and behaviors inherited in the country of origin (*i.e. the cultural hypothesis*). Second, the migration episode may have a direct impact on health as a result of income shocks or other changes in life style directly related to the movement (*i.e. the causal or direct effect of migration*). Finally, it may be that only healthy individuals are ready to make their way to a remote and unfamiliar labor market. As a result, individuals in the upper tail of the health distribution are more likely to migrate (*i.e. the selective migration hypothesis*).

The aim of this paper is to better understand the channels driving the healthy immigrant effect. I will focus on a very interesting episode in international migration, namely the Ecuadorian Exodus in the aftermath of the economic collapse of the late 1990s. Between 1999 and 2005, more than 600,000 Ecuadorians left the country and most of them headed towards Spain rather than the US, a traditional destination for Ecuadorian migration (Bertoli et al. 2011). Taking advantage of some interesting

[1] For the US see Jasso et al. 2004, Abraido-Lanza et al. 1999, Antecol and Bedard 2006, and Giuntella 2012. A healthy immigrant effect for immigrants has also been documented in Chen et al. 1996, Deri 2003, McDonald 2003, and Laroche 2000, while Donovan et al. 1992, Chiswick et al 2008, and Powles 1990 do so for immigrants to Australia.

features of this episode, I find a health advantage in terms of birth weight and other birth outcomes (i.e. gestational age, incidence of low birth, and death before 24 hours) among the children of new Ecuadorian immigrants in Spain. The comparison to children of non-immigrants in Ecuador and to those of another recent minority group in Spain (i.e. Romanians) suggests that positive selection in health is partly responsible for the health advantage of immigrants from Ecuador.

Health economists argue that birth weights are strongly correlated with a mother's habits during pregnancy and her health. For example, recent research shows that fasting during pregnancy results in lower birth weight and reduces gestational length (Almond and Mzaumder, 2013). There is also evidence that economic crisis have a negative impact on the weight at birth, that is particularly strong among low-income women (Bozzoli and Quintana, 2013). Moreover, the health literature indicates that birth weights are an important marker of an infant's health at birth and as an adult. Using administrative data for Norway, Black et al (2007) show that a 10 percentage points increase in birth weight increases height by 0.57 centimeters at the age of 18; increases the probability of overweight and decreases the probability of under weight by 1 percentage point each; increases the probability of high school completition by 1 percentage point and full-time earnings by a 1 percent. These effects are constant across the birth weight distribution, rejecting the existence of non-linearlities.[2]

In this paper I explore the existence and the nature of a health advantage in favor of recent Ecuadorian immigrants in Spain, using administrative data on birth outcomes (i.e. Vital Statistics) for Spain and Ecuador. The paper is structured as follows: the next section provides a brief overview of the literature; section III highlights the main features of the migration episodes analyzed in the paper; section IV describes the data and section V the empirical methodology; section VI discusses the results and section VII presents some final remarks.

II. Literature on the Healthy Immigrant Effect

Researchers from a wide array of disciplines have studied health differences between immigrants and native-born individuals, mainly in the US, Canada and Australia. Alternative explanations have been proposed to account for the health advantage among recent immigrants. First, it has been suggested that the advantage could respond to the health screening that is part of the migration process in some countries. However, some evidence indicates that admission policies are not the principal determinant of the health gap. For example, Laroche (2000) reports that the percentage of applicants to Canada that are rejected on health grounds is very low and Uitenbroek

[2]Similar results are found for the US by Behrman and Rosenzweig (2004); Currier and Moretti (2007); and Currier (2007).

and Verhoeff (2002) argue that the selection by authorities based on health can not explain the lower mortality of Mediterranean immigrants in Amsterdam.

The second explanation is that healthy diets, habits and behaviors in the home country lead to potential immigrants who are relatively healthier than the average person in the recipient country. The hypothesis based on cultural differences is put forward in Abraido-Lanza et al. (1999) who argue that the lower mortality of Latinos in the US results from their more favorable health habits (i.e. less alcohol and cigarette consumption which are the major risk factors for cancer and heart diseases, the most common causes of death for both Latinos and non-Latino Whites).

A third possibility is that the migration episode has a direct impact on an individual's health due to the associated income shocks or environmental changes. Evidence on the causal impact of migration is rather scarce due to the methodological difficulties involved in estimation. To identify the direct effect of migration the health of immigrants upon arrival to the country has to be compared to what their health would have been had they stayed in their home country. This counterfactual is typically unobserved. An exception is the work by Stillman et al. (2012) where using data from a unique survey compare the health of migrant children who enter New Zealand through a random ballot with children in the home country of Tonga whose families were unsuccessful participants in the same ballots. Their findings indicate that migration increases height and reduces stunning of infants and toddler, but also increases BMI and obesity among 3 to 5 years old. The authors argue that changes in dietary habits (i.e. larger intakes of meat, fat and milk) rather than the income gains associated to migration explain the findings.

Finally, the better health of recent immigrants could respond to selective migration. There are reasons (and evidence) to suspect that immigrants are different from those who do not migrate. The literature on selection based on labor market outcomes (wages) and education tend to find evidence of positive selection (Chiquiar and Hanson 2005; McKenzie and Rapoport 2007, 2010; Orrenius and Zavodny 2005; Chiswick 1978, 1999, 2007; Belot and Hatton 2008; Grogger and Hanson 2008), though some evidence of negative selection has also been reported for Mexico (Borjas 1987; Fernández-huertas Moraga 2011). If positive selection in productive skills dominates migration movements, given the strong correlation between income and health, positive selection in health should also be observed. Indeed if immigrants are selected from the high end of the income distribution in their home countries, they are likely to have access to better diets, better access to clean water and sanitation, less exposure to environmental risks and better child/maternal health care. Even in the absence of selective migration in skills, positive selection in health is also expected if immigrants are forward looking (i.e. make current behavioral choices that emphasize future health at the expenses of current time/effort) or if sick individuals are more

reluctant to leave the origin to make his or her way in an unfamiliar labor market.[3]

A major drawback in previous studies is that most of the conclusions are based on comparisons between immigrants (generally legal) and natives at destination. Such a comparison does not allow disentangling the contribution of selection from that of healthy habits or any direct effect of migration on health. There are a couple of recent exceptions that compare the health of non-immigrants and immigrants before the movement occurs. The study by Rubalcava et al. (2008) employs longitudinal data from the Mexican Family Life Survey to compare emigrants from Mexico to the US to similar non-emigrants. The results suggest some evidence of positive selection in terms of physical health outcomes. In contrast, Stillman et al (2009) using data from Tongan potential immigrants and non-immigrants find that individuals in poor mental health are more likely to apply to migrate.

Data to compare immigrants and non-immigrants in the sending country are rather scarce since most migrants originate from developing countries without tradition on data collection. In this paper, I employ the Vital Statistics in Ecuador and Spain to compare the birth outcomes of immigrant children in Spain to that of non-immigrants in Ecuador and natives in Spain. Due to confidentiality issues, the same individual cannot be identified in the Vital Statistics of the two countries, and therefore the comparison before the movement occurs is not possible. I then propose an alternative strategy that relies on empirically testing an important prediction of the migration model in Borjas (1987). According to this model, individuals only migrate if the benefit of the move is larger than its associated cost. Since the cost of migrating increase with distance, immigrants from more remote areas should be more positively selected than those from neighboring ones. The large and diverse migration wave to Spain during the last decade offers an excellent scenario to investigate this conjecture. Since the early 2000s immigrants from different origins arrived to Spain attracted by the growing economy and the many job opportunities, in particular in the construction sector. The similarity between Ecuadorian and Romanian immigrants in many dimensions (e.g. socioeconomic characteristics and linguistic barriers) but geographical origin allows me to test whether selection is inversely proportional to geographical distance. For robustness, the comparison is also extended to children of Colombian and Bulgarian immigrants born in Spain.

The focus is on immigrants from Ecuador as the migration episode between the Latin American country and Spain has some other interesting features that make it an interesting case study to better understand the healthy immigrant effect. First, since the bulk of Ecuadorian immigrants moved to Spain between 1999 and 2003, the sorting of immigrants across different countries are not likely to distort the results. Second, since 2001 the Vital Statistics in Spain contain information on immigrants

[3]Evidence of positive self-selection on health has been documented in Jasso et al. (2004), Palloni and Morenoff (2001) and Antecol and Bedard (2006).

irrespective of the legal status. A change in the law granted all registered individuals access to the public health and education system. This provided incentives to both legal and illegal immigrants to register their newborns and to appear in the Vitals Statistics.[4] Finally, immigration to Spain is a recent phenomenon, and most of the foreign-born in the early 2000s were likely to be recent immigrants. Hence, the effect of acculturation or assimilation on the health gap in the early 2000s (if any) is likely to be small.

III. Two large migration episodes

Between 2000 and 2007 Spain received an impressive inflow of immigrants – approximately 500,000 per year. The share of the foreign born population shifted from about 3% in the late 1990s to more than 16% by 2007. Table 1 display the stock of immigrants in Spain during the 2000s recorded in the Local Population Registry.

The composition of migrants changed over time. While in the 1990s migrants originated mainly from the EU-15 countries, they were rapidly overtaken by South Americans and migrants from the EU enlargement member states. The largest minority groups in Spain during the last decade were: Moroccans, Romanians and Ecuadorians. While the first group had a large tradition in the country, Romanians and Ecuadorians massively arrived in the early 2000s (see Table A1 in the Appendix).

The Ecuadorian Exodus

As a result of the economic and financial crisis Ecuador collapsed in 1999. This represented an important push factor for abut 600,000 individuals who over a period of a few years (1999-2005) left from a country with a population of 12.7 millions. A unique feature of this migration episode is that the US and Spain received about 80 to 90% of all Ecuadorians. Moreover, the number of Ecuadorians that migrated to Spain was roughly 3 times larger than the corresponding flow to the US. Bertoli et al (2011, 2013) argue that the lower cost of migrating explains the huge exodus towards the low income country.

The migration policy in Spain was particularly attractive for Ecuadorians. Since 1963 a visa waiver program allow them to enter as a tourist for a period of up to three months. Those who wished to migrate could simply overstayed the three-months period, became undocumented workers, and wait for one of the frequent amnesties in the early 2000s to legalize their status.[5] The lax Spanish immigration

[4] The Spanish data protection policy prevents the police to access the Local Population Registry to identify illegal aliens.

[5] In the first half of the 2000s there were three amnesties to illegal immigrants in Spain (2000,

policy substantially influence the location choices of immigrants. According to the calculations in Bertoli et al (2011) the Ecuadorian population in Spain increased from 76,000 individuals before 2000 to 457,000 in 2005, and represented 12 percent of immigration flows to Spain between 1999 and 2005.[6]

The visa waiver program was terminated in August 2003. After this date, Ecuadorian migrants needed a visa to enter any EU member state. The inflows of Ecuadorians to Spain dropped sharply immediately after the requirement, and the United States became again the main destination (Bertoli et al 2011). Table 1 also shows the stabilization in the stock of immigrants from Ecuador during the second half of the 2000s.

A salient feature of the Ecuadorian exodus is that most of those who moved in the aftermath of the crisis headed towards Spain. Thus the analysis of the birth outcomes of immigrants in the early 2000s in Spain should be weakly affected by sorting across countries. Bertoli et al (2011) investigate the selection and sorting of Ecuadorian immigrants in terms of productive skills (education and wages) during this period. They find that immigration to Spain is gender balanced and some evidence of negative selection in education (particularly among men).

The Romanian Experience

Before the collapse of the Romanian communist regime in December 1989, the official statistics reported very low numbers of emigrants, who were mostly political refugees and/or relatively highly educated Romanians of another ethnicity (Jews, Germans and Hungarians). By the mid 1990s a new pattern of labor migration emerged against the background of a slow pace of economic restructuring which resulted in a large decline in GDP, high inflation, mass layoffs, decreasing real wages and rising unemployment.[7]

The migration outflows sharply increased in 2001 when Schengen visa restrictions were lifted, and Romanian citizens gained right to free circulation within the Schengen area. By 2010, Romanian immigrants were the most represented foreign group in both Spain and Italy. These two countries each hosted around 40% of Romanian immigrants in Europe, followed by Germany (5.72%), the UK (3.78%), Austria (2.23%), France (2.3%), Portugal (1.52%), Greece (1.73%) and Belgium (1.24%) (Andrén and Roman, 2013).

2001 and 2005).

[6] The same authors estimate that the Ecuadorian population in the US increased from 272,000 individuals before 2000 to 394,000 in 2005, and represented 1.3 percent of immigration flows in the US during this period.

[7] De-industrialization led to a decrease of industrial employment by almost 3 million jobs and particularly affected younger and older workers, who were less likely to find new employment opportunities (Voicu 2005).

The movements of Romanians towards European countries have been characterized by strong selection patterns (Ambrosini et al., 2012). A first group of strictly positive selected immigrants has characterized migration flows to traditional immigration countries (US, Canada and Australia). These flows are rather small but persistent and include a significant share of young people who migrate for educational purposes. A second group of neutral average selected immigrants moved to the continental European countries over the 1990s: Germany, Austria and France. Finally, towards the end of the 1990s and the early 2000s, large flows of Romanian migrants arrived in Mediterranean countries, mainly Spain and Italy. These flows were characterized by negative selection in terms of productive skills.

IV. Data

This study employs birth outcomes, in particular weights, as a measure of an individual's health. The birth weight is the body weight of a baby measured at most one hour after birth. While it may suffer from measurement error, it is not affected by the biases inherent to self-reported health questions employed in other studies. A main problem with reported assessments of one's own health is that it depends on the reference group. If the group is not stated, comparisons across individuals become difficult (King et al. 2004). This is particular relevant for immigrants whose comparison group may change with the process of assimilation. The use of the prevalence rate of some diseases (i.e. diabetes, heart diseases, asthma or diseases of the lung) is also subject to criticism as the lower incidence of chronic diseases reported by foreigners may simply result from their less frequent contact with western medial diagnostics.

This paper employs the information in the Vital Statistics of Ecuador and Spain. The Vital Statistics for Romania are not available, and the information regarding the birth outcomes of Romanian immigrants is collected from the Vital Statistics in Spain. The information in the Spanish and Ecuadorian Vital Statistics corresponds to all births in the Local Population Registry. In both countries, registration is the administrative procedure to legalize a vital event.[8] Hence, the Statistics give coverage to all legalized births occurred in both countries.[9]

The analysis is restricted to the early 2000s, and in particular to 2001-2003. There are several reasons to justify this time constraint. First, the Vital Statistics do not contain information on years since arrival and it is therefore not possible to account

[8] In order to register a birth, the parents or the legal representative of the child have to present a document with statistical information on the birth outcome (Informe Estadístico del Nacido Vivo in Ecuador, figure 1A or Boletín Estadístico del Parto in Spain, figure 2A).

[9] As discussed, immigrants in Spain since 2001, independently of their legal status, have strong incentives to appear in the Local Population Register to have access to the public health and education system and to prove residence in Spain for future amnesties.

for the effect of acculturation and assimilation on birth outcomes. The inflow of Ecuadorians to Spain started in 1999 and was substantially interrupted after August 2003, when the visa waiver program terminated. Similarly, immigrants from Romania started to arrive massively in 2001 when Schengen visa restrictions were lifted. Hence, the majority of births to Ecuadorian and Romanian mothers registered between 2001 and 2003 are likely to be to recent immigrants. Second, the Local Population Registry (and thus the Vital Statistics) contains accurate information on immigrants (both legal and illegal) only after the approval of the new immigration law in 2000. Finally, the Vital Statistics in Spain until 2006 has information only about the nationality of the mother and not her country of birth. In the early 2000s there were 3 amnesties to legalize immigrants (2001, 2002 and 2005). Hence by the mid-2000s many foreigners may have obtained the Spanish citizenship and thus could not be identified as immigrants.

Table 2 shows the percentage of births occurred in Spain by nationality. The effect of the large immigration inflow is clear: the number of total births increased from 406,380 in 2001 to 519,779 in 2008 (the first year of the Spanish economic recession) and the share of births to foreign mothers shifted from 8.24 to 20.81 percent in this period. The incidence of the Ecuadorian exodus is also present in the table. The number of birth to Ecuadorian mothers doubled between 2001 and 2003 (from 5,649 to 10,517) and by 2003 represented the 2.38 percent of total births. The table also shows the increase in the birth rate to Romanian immigrants, the largest minority group in Spain in the late 2000s.

Table 3 displays the mean weight in grams for the period 2000-2005 by nationality in Spain. For a 5% of the births the information on weight is not recorded, and these observations are excluded. Following previous work on the determinants of birth weight, I focus on mothers aged 15-49, exclude multiple births and those newborns whose weight was either under 500 grams or above 9,000 grams. The table indicates that newborns to foreign mothers are about 50 to 80 grams heavier than those born to natives (in 2001, 3,292 grams for immigrants and 3,237 for natives). By foreign nationality, the heaviest babies are born to Ecuadorians (3,273 grams) and then Romanians (3,219 grams). This ranking is not consistent with the aggregate health statistics reported by the World Bank in the origin countries (see Table 4). Accordingly, babies born in Romania are, on average, heavier than those born in Ecuador (3,186 grams in Romania and 3,102 in Ecuador).

The second data source employed is the Vital Statistics for Ecuador, from the Instituto Nacional de Estadística y Censos. Table 5 compares the mean birth weight of non-immigrants in Ecuador to that of immigrants in Spain in the early 2000s. The comparison indicates an important health advantage in favor of immigrants: babies born in Ecuador are about 170-150 grams lighter than babies born in Spain to Ecuadorian mothers.

The incidence of underreport birth weight in the Ecuadorian data is substantial in the early 2000s. However, the rate was unevenly distributed across different groups. According to Table A2 underreport in 2001 was less than 30% among mothers with more than primary education and among births that happened in hospitals. This rate was also much lower in urban than in rural areas. By 2002, the underreport rate had decreased to 32% in urban areas, to 20% in hospitals and to 24% among mothers with more than primary education. Section VI investigates the implications of underport for the results. Due to the incidence of underreport, the information on birth weights collected in the Vital Statistics is not likely to be representative of the whole Ecuadorian population: mothers with more than primary education and middle/high-income groups living in urban areas are likely to be overrepresented. While this may be seen as a limitation, the validity of the study is reassured when looking at the characteristics of the migrants. Bertoli (2010) documents that the wave of Ecuadorian migration who moved in the aftermath of the crisis came mostly from the urban areas, which were more severely hit by the crisis (suspension of the wage payment to public employees and slash in real wages due to devaluation). Its has also been argued that in the early stage of the migration process is the middle class of the wealth distribution who has the means and incentives to migrate (McKenzie and Rapoport 2007). Hence, the group of non-immigrants in Ecuador with valid information on birth weights in the early 2000s is likely to be closer to immigrants to Spain than the Ecuadorian population as a whole. This will limit the magnitude of the bias due to different composition of the comparison group. Section VI discusses the implications of underreport for the results.

The paper employs two additional data sets to investigate the fertility patterns and socioeconomic characteristics of different ethnic groups. The Spanish Labor Force Survey for the years 2000-2004 (Encuesta de Población Activa, EPA) and the Ecuadorian Labor Force Survey for the year 2001 (Encuesta Nacional de empleo, desempleo y subempleo, EMENDU). Both surveys include household level information on the socioeconomic characteristics of their family members, with particular attention to their labor market status.

Finally, I also employ the National Immigrant Survey conducted in 2007 by the Statistical Office in Spain (Encuesta Nacional de Inmigrantes, ENI 2007). This survey analyzes the characteristics of the large inflow of immigrants to Spain. It covers the entire national territory and all immigrant groups. It is aimed at studying the demographic and social characteristics of immigrants as well as their migration itineraries, work and residential histories.

V. Empirical Methodology

The first step in the empirical strategy is to asses the magnitude of the healthy immigrant effect. Accordingly, I estimate the following model:

$$birthweight_i = \alpha + \beta^{HIE} I_{1i} + u_i \tag{1}$$

where the dependent variable, $birthweight_i$, is the weight at birth of the child born to individual i. I_{1i} is an indicator variable that equals 1 if individual i is an immigrant and 0 otherwise. The OLS estimate of β^{HIE} in equation (1) is obtained from the comparison of birth weights between children born to natives and those born to Ecuadorian immigrants in Spain. It can be interpreted as the healthy immigrant effect. As discussed, differences in birth weight may result from the healthier habits and behaviors of immigrants (β^{habits}), the existence of a causal or direct effect of migration on health ($\beta^{migration}$) or from selective migration ($\beta^{selection}$). That is:

$$\beta^{HIE} = \beta^{habits} + \beta^{selection} + \beta^{migration}.$$

Since healthy habits are common to individuals originating from the same country, the comparison of birth outcomes between immigrants at destination and non-immigrants in the source country produces a joint estimate of the effect of selection and of any causal effect of migration. The OLS estimate of this effect can be obtained from:

$$birthweight_i = \alpha + \delta I_{2i} + u_i \tag{2}$$

where $\delta = (\beta^{selection} + \beta^{migration})$ and I_{2i} is equal 1 if i is an immigrant in Spain and 0 if i is a non-immigrant in Ecuador.

To disentangle the contribution of selective migration from that of any direct or causal impact of migration, one would need to compare the health distribution of recent immigrants to their distribution had they not migrated. Experimental data to assess the presence of selective migration is rather scarce (see McKenzie et al. 2010). This paper takes an alternative approach and employs administrative data to test the prediction that the selection of immigrants increases with distance to destination. That is, immigrants from more remote areas should be healthier than those originating from neighboring areas to compensate the higher cost of the movement. The empirical exercise in the next section will compare the birth outcomes of two of the largest ethnic minorities that have recently arrived to Spain from very different geographical regions: Ecuador and Romania. Table 6 summarizes the economic costs of moving to Spain from different destinations over the period 1999-2003 and 1999-2007, when the largest inflow of immigrants arrived to Spain. This information is collected from the National Immigrant Survey conducted in Spain in 2007. The survey interviews

immigrants in many dimensions, and, in particular, they are asked to provide all the costs associated to the movement from their country of origin. These costs are not only restricted to transport expenditures such as air fares or train tickets, but also all types of travel allowances (food, accommodation, etc...), the cost of obtaining a visa or other legal document, and any other expenses incurred before or during the migration episode. Table 6 shows that the cost of migrating from Ecuador is 3,5 time larger than that of moving from Romania (i.e. 1,609.72 Euros from Ecuador and 464.95 Euros from Romania). Thus immigrants from Ecuador are expected to be drawn from a higher end of the health distribution.

To formalize this idea I use the notation in the program evaluation literature and define a health equation (in terms of birth outcomes) for immigrants:

$$birthweight_i(I_{2i} = 1) = \mu(1) + U_i(1) \tag{3}$$

and non-immigrants:

$$birthweight_i(I_{2i} = 0) = \mu(0) + U_i(0) \tag{4}$$

where $U_i(0) \sim N(0, \sigma_{U0})$ and $U_i(1) \sim N(0, \sigma_{U1})$.

In the presence of selection, the effect of migration on health is heterogeneous in the population. In particular:

$$\Delta_i = [\mu(1) - \mu(0)] + [U_i(1) - U_i(0)] \tag{5}$$

where $[\mu(1) - \mu(0)] = E\{\Delta_i\}$ is the average gain from migration in the population, namely the direct or causal effect of migration ($\beta^{migration}$). The second part of equation (5), $[U_i(1) - U_i(0)]$, represents the idiosyncratic gain from migration.

Note that the model in equation (3) and (4) can be rewritten as:

$$birthweight_i = \mu(0) + \Delta_i I_{2i} + U_i(0). \tag{6}$$

It can be shown that the OLS estimate of Δ_i in equation (6) is:

$$\begin{aligned} E[birthweight_i|I_{2i} &= 1] - E[birthweight_i|I_{2i} = 0] = \\ E\{\Delta_i\} + E[U_i(1)|I_{2i} &= 1] - E[U_i(0)|I_{2i} = 0] = \\ &\beta^{migration} + \beta^{selection}. \end{aligned}$$

Under perfect randomization (i.e. migration is the result of a lottery):

$$\begin{aligned} E[U_i(1)|I_{2i} &= 1] = E[U_i(1)] = 0 \\ E[U_i(0)|I_{2i} &= 0] = E[U_i(0)] = 0 \end{aligned}$$

and the OLS estimate of Δ_i in equation (6) is:

$$\begin{aligned} E[birthweight_i|I_{2i} &= 1] - E[birthweight_i|I_{2i} = 0] = \\ E\{\Delta_i\} &= \beta^{migration}. \end{aligned}$$

In the presence of selective migration, the decision to migrate can be modeled as:

$$I^*_{2i} = \gamma Z_i + V_i$$

where $V_i \sim N(0, \sigma_V)$. An individual will migrate only if the latent variable I^*_{2i} is above a certain threshold and will not otherwise. That is:

$$\begin{aligned} I^*_{2i} &> 0 \rightarrow (I_{2i} = 1) \rightarrow (V_i > -\gamma Z_i) \\ I^*_{2i} &\leq 0 \rightarrow (I_{2i} = 0) \rightarrow (V_i \leq -\gamma Z_i). \end{aligned}$$

When $Cov(U_i, V_i) = \rho \neq 0$ by the properties of the normal distribution:

$$E[U_i(1)|I_{2i} = 1] = E[U_i(1)|V_i > -\gamma Z_i] = E[U_i(1)] + \rho\sigma_{U1}\frac{\phi(\gamma Z_i)}{\Phi(\gamma Z_i)}.$$

In this framework the contribution of selective migration on health can be assessed by rewriting the model in equation (6) as:

$$E[birthweight_i|I_{2i} = 1] = \mu(0) + E\{\Delta_i\} + E[U_i(1)|I_{2i} = 1].$$

Let us now consider two groups of immigrants from two different geographical origins, Ecuador (EC) and Romania (ROM):

$$\begin{aligned} E[birthweight_i|I^{EC}_{2i} &= 1] = \mu^{EC}(0) + E\{\Delta_i\} + E[U^{EC}_i(1)|I^{EC}_{2i} = 1] \\ E[birthweight_i|I^{ROM}_{2i} &= 1] = \mu^{ROM}(0) + E\{\Delta_i\} + E[U^{ROM}_i(1)|I^{ROM}_{2i} = 1]. \end{aligned} \tag{7}$$

Assume that:

1) The direct or causal effect of migration is the same for Ecuadorians and Romanians:

$$E\{\Delta_i\} = \beta^{migration}$$

2) The distribution of unobservable characteristics has mean equal zero in the two populations:

$$E[U_i^{EC}(1)] = E[U_i^{ROM}(1)] = 0$$

3) Migration is not due to health reasons (i.e. those in worse health are not more likely to migrate):

$$Cov(U_i, V_i) > 0$$

Under these assumptions the difference between the two equations in (7) is:

$$\begin{aligned} E[birthweight_i | I_{2i}^{EC} &= 1] - E[birthweight_i | I_{2i}^{ROM} = 1] = \\ [\mu^{EC}(0) - \mu^{ROM}(0)] + (E[U_i^{EC}(1) | I_{2i}^{EC} &= 1] - E[U_i^{ROM}(1) | I_{2i}^{ROM} = 1]) \end{aligned} \quad (8)$$

The first term in equation (8), $[\mu^{EC}(0) - \mu^{ROM}(0)]$, is negative as, according to the health statistics reported in Table 4, the average birth weight in Ecuador (3,102 grams) is lower than the average birth weight in Romania (3,186 grams).

Under the assumption that migration costs increase with distance, one would expect immigrants from Ecuador to be more positively selected than those from Romania. Thus, the second term in equation (8), $(E[U_i^{EC}(1)|I_{2i}^{EC} = 1] - E[U_i^{ROM}(1)|I_{2i}^{ROM} = 1])$, should be positive. Thus, the hypothesis that selection increases with geographical distance can be tested by estimating the following model:

$$birthweight_i = \alpha + \lambda I_{3i} + u_{it} \quad (9)$$

where I_{3i} equals 1 if i is an immigrant from Ecuador and 0 if i is an immigrant from Romania. In this context, a $\lambda > 0$ in equation (9) is evidence of positive selection in favor of Ecuadorian immigrants.

VI. Results

The Healthy Immigrant Effect

The estimates of the healthy immigrant effect are reported in Table 7. The estimated coefficients correspond to the model in equation (1), where the birth weight of children born to Ecuadorian mothers in Spain is compared to that of children born to native women in Spain. The model in equation (1) is extended by including as additional controls an indicator for the gender of the child (*male*), a set of dummies for the age of the mother when the birth occurs, an indicator for the month of birth, and indicators for the province of residence in Spain.[10] Each column correspond to a

[10]Spain is divided into 52 administrative provinces. Previous work has documented that immigrants by nationality are highly segregated across provinces (see, for example, Farré et al. 2011).

different regression estimated between 2001 and 2003. The estimates indicate an advantage in favor of immigrants between 85 and 91 grams. Since the majority of Ecuadorians in the early 2000s were recent immigrants, these estimates are not likely to be affected by the process of assimilation or acculturation. Figure 1 plots the kernel estimates of the birth weight distribution of immigrants (solid line) and natives (dashed line) in 2001 and Figure 2 the difference between the two distributions. The figures suggest that the health advantage in terms of birth weight is not only concentrated in the mean of the distribution, but it also present in other parts, in particular the upper tail.

Natives and immigrants may differ in many dimensions, some of them having a direct impact on birth outcomes. First, immigrants tend to be positively selected in terms of education and productive skills. The health economic literature has established a strong relationship between parental education and a child's health (Currier 2009). Hence, positive selection in education could lead to higher birth weight among immigrants. Unfortunately the Spanish Vital Statistic does not contain information on maternal education until 2007. For the years in our analysis we can only control for differences in productive skills by including in the regression the mother's labor market status and an indicator for being employed in a high skilled occupation. Since these variables are not perfect proxies for educational achievement, the estimate of the health gap could still be biased. However, Bertoli et al (2011) find some evidence of negative selection in term of the education of Ecuadorian immigrants to Spain. Thus, the omission of maternal education from equation (1) should, if any, produce a negative bias on the health gap.

Differences in family size may also be relevant for health outcomes. The child quality investment model (Becker 1981 and Chiswick 1988) predicts that, at any given level of family resources, more children imply smaller levels of investment per children and thus lower quality. Accordingly I control for the presence and number of previous children, and a variable that captures the effect of birth spacing. As a robustness test at the end of this section I further investigate the implications of differences in fertility behavior for the results. It has also been documented that parental income affects child health (Currie and Moretti 2007). The Vital Statistics do not contain information on family income or wealth. To proxy for the level of economic resources I include as additional regressors in equation (1) an indicator for the marital status of the mother and another for being born at a hospital, in addition to the labor market indicators previously discussed.

The results of the extended model are presented in Table 8. For all years, the weight advantage in favor of immigrants increases by about 10 grams and remains highly significant. The variables capturing the economic situation of the family (being born in a hospital, married, mother's work and mother working in a high skilled occupation) have all a positive effect. The coefficients on the variables related to

family size are also positive. There is also evidence of a negative effect from birth spacing.

It has also been highlighted that the process of cultural assimilation is faster among interethnic couples (Meng and Gregoy 2005 and Chiswick et al 1997). In an attempt to investigate the effect of acculturation on birth outcomes, I estimate the effect of intermarriage on birth outcomes. The results presented in Table A3 indicate that intermarriage does not have any effect on birth weights. This is likely to be due to the high degree of sorting in the data. In 2001, a 0.31 percent of the births were to interethnic couples and this percentage increased to only 0.71 percent in 2005.

Table 9 examines the presence of the healthy immigrant effect in alternative birth outcomes that are popular in the literature. The table shows the estimates for the model in equation (1) where the dependent variable has been replaced by a low birth weight indicator (column 1), the number of gestational weeks (column 2), an indicator for being born between week 38 and 42 (i.e. normal term) (column 3), one for pre-term birth (column 4), and one for death in the first 24 hours after birth (column 5). The estimates indicate a health advantage in favor of Ecuadorian immigrants in terms of the incidence of low birth weight (i.e. 2 percentage points lower probability), gestational age (i.e. 0.043 additional weeks of gestation), the probability of being born between week 38 and 42 (i.e. 1 percentage point higher) and the probability of pre-term birth (i.e. 1 percentage point lower). No differences are observed for the probability of dying 24 hours after birth. The message from the estimates in Table 7 to 9 is clear: upon arrival to Spain, children born to Ecuadorian mothers are heavier and thus healthier than those born to native women.

As argued in the health economic literature, this health advantage in terms of birth outcomes may have implications on future outcomes and maybe compensate part of the negative effect associated, for instance, to the presence of discrimination (Bosch et al. 2010). The findings are also consistent with the extensive evidence on the health immigrant effect documented for Mexican immigrants in the US and other minority groups in Canada and Australia.

Next, I compare the weight of babies born to Ecuadorian immigrants in Spain to that of non-immigrants in Ecuador. Table 10 shows the estimates of the model in equation (2) including as additional controls the gender of the child, the age of the mother and the month of birth. The estimates indicate that newborns to immigrants are between 168-148 grams heavier than those born to non-immigrants. Health indicators are in general better in Spain than in Ecuador (see Table 4), and this may partly reflect better health care systems or some other environmental factors (i.e. less pollution[11]). Table 11 removes from the previous estimate the effect of being born in Spain (common to both natives and immigrants). The net birth weight difference is

[11] Currie and Walker (2011) show that traffic congestion (and thus pollution) contributes significantly to poor health among infants.

reduced to 60-65 grams, and remains highly significant at any conventional level.

Figure 2 plots the birth weight distribution of immigrants in Spain (solid line) and non-immigrants in Ecuador (dashed line) in 2001. The distribution for migrants lies clearly to the right of that for non-immigrants, reassuring that the health advantage estimated for the mean of the distribution by OLS is present along all the domain of the distribution, in particular the middle/upper part.[12] This result is also evident from the plot of the difference between the native and immigrant distribution (see figure 2b).

Table 12 investigates the implications of differences in observable characteristics between immigrants and non-immigrants. The set of additional controls included in estimation is limited to the variables that are common to the Vital Statistics of the two countries, namely those related to fertility histories (i.e. the presence and number of previous children) and whether the child was born at a hospital. The impact of these controls is small, as the birth weight gap is only reduced by 10 grams.

Two additional considerations should be taken into account when analyzing the results in Table 11 to 12. First, Ecuador was immerse in a major economic recession in the early 2000s, which may have had a negative effect of birth outcomes. Indeed, Bozzoli and Quintana (2013) documents the existence of procyclicality in birth weights for Argentina. Second, a non-negligible fraction of the observations in the Ecuadorian Vital Statistics do not report information on birth weights in the early 2000s. To further investigate the implications of these two concerns, Table A5 compares the estimates of the birth weight gap obtained from different samples. Column (1) shows the estimated gap between immigrants and non-immigrants for the year 2001-2002. In column 2 the gap is estimated from comparing the birth weight of immigrants in 2001-2002 to those of non-immigrants in Ecuador in 2006 and 2007, when the crisis was over. Finally, column 3 compares immigrants in Spain in 2001-2002 with non-immigrants in Ecuador over the period 2000-2010.[13] In all three specifications, the weight advantage in favor of immigrants remains statistically significant and of similar magnitude, suggesting that the previous concerns do not have implications for the results.

The estimated health advantage for Ecuadorian immigrants relative to their native counterpart may result from a direct causal effect of migration and/or the presence of selective migration. To the best of my knowledge, no paper has been able to identify the causal effect of migration on birth outcomes. The closest evidence is the paper

[12] Table A4 replicates the results in Table 11 but replacing the birth weight dependent variable by a low birth indicator. While there is a statistically negative effect on the immigrants' low birth probability, its magnitude is very small (i.e. the likelihood of low birth is 0.3 percentage points lower among immigrants than natives). This reinforces the result that most of the action occurs in the middle/upper part of the distribution.

[13] The incidence of underreport birth weight substantially decreases over this period.

by Stillman et al. (2012) where using the Tongan migrant lottery investigates the effect of migration on child health. They find that migration increases height and reduces stunning of infants and toddler, but also increases BMI and obesity among 3 to 5 years old. The authors argue that changes in dietary habits (i.e. larger intakes of meat, fat and milk) rather than the income gains associated to migration explain the findings. While those changes in dietary habits would most probably have a positive effect on birth weight, there may be countervailing effects from migration that are not identified in Stillman et al. (2012) as children in their sample are born before migration occurs. The migration episode may be stressful (i.e. social, cultural and economic changes involved) and newcomers may face some post-migration living difficulties that may negatively affect birth outcomes (see Camacho 2008; Almond and Mazumder, 2011; and Bozzoli and Quintana, 2013 for evidence of the negative effect of stress and malnutrition on birth outcomes).

To gain a better understanding of the factors behind the health gap I take advantage of the large and diverse inflow of immigrants to Spain in the 2000s. I will focus the next comparison on immigrants from Ecuador and Romania. These two minority groups are comparable in many dimensions. First, the cultural and linguistic barriers are low for both groups (i.e. Spanish is the language of Ecuador, and Romanian is a Romance language very close to Spanish[14]). Second, the bulk of Ecuadorians and Romanians arrived between 2000 and 2003.[15] Third, the two groups moved to Spain for economic reasons. Ecuadorians came escaping from the economic and financial collapse in 1999, while immigrants from Romania arrived looking for jobs, as a result of the high unemployment rates after the massive restructuring of state enterprises in the late 1990s. Finally, table A6 in the Appendix shows that Romanian and Ecuadorian immigrants in Spain are similar in terms of age, education and work status. The main difference between the two is observed in terms of fertility outcomes: a 49 percent of the Romanians have children, as opposed to 76 percent of the Ecuadorians and the average number of kids is 1.42 and 1.79 respectively. The implications of these different fertility behaviors are investigated at the end of this section.

The standard migration model predicts that immigrants from more remote areas should be more selected in terms of health. Table 13 investigates this hypothesis by estimating the model in equation (3) where the birth outcomes of Ecuadorians are compared to those of Romanians. Most of the birth outcomes indicate a health advantage in favor of Ecuadorians: newborns to Ecuadorian mothers are 52 grams heavier, have a smaller probability of low-birth weight (2.8 percentage points lower), longer gestational age (0.15 weeks), a higher probability of being born between week

[14]The lexical similarity of Romanian with Spanish has been estimated at 71%.

[15]Table A1 in the Appendix indicates that among Ecuadorian immigrants living in Spain between 2000 and 2004 a 70% of them arrived between 2000 and 2004. This percentage is 60% among Romanians.

38 and 42 (3.2 percentage points higher), a lower incidence of pre-term birth (3 percentage points lower) and a lower probability of death during the first 24 hours (0.2 percentage points).[16] All these effects are statistically significant at any conventional level.

Overall, the results from the previous comparisons reveal a health advantage for children born to new Ecuadorian immigrants in Spain. Upon arrival, newborn babies are 100-85 grams heavier than those born to natives, and 64-48 grams heavier than those left behind. While I cannot precisely estimate the contribution of selection to these results, the comparison in terms of several birth outcomes between newly arrived immigrants from Romania and Ecuador supports the idea that positive selection in health increases with distance to destination.

Robustness checks

A) *Comparison to other ethnic groups*

To further investigate the hypothesis that immigrants from more remote areas are more likely to be positively selected I extend the comparison to other ethnic groups also popular in Spain, namely Colombians and Bulgarians. During the early 2000s Colombian immigrants were the third largest group after Moroccans and Ecuadorians (see Table A7). Bulgarians are a smaller group, but represented the 8^{th} most popular immigrant-sending country in 2004 and the second largest group among Eastern European immigrants in Spain.[17]

Colombian emigration began in the 1960s, mainly in search of better economic opportunities. During the first migration wave of the sixties and the seventies, emigration was mostly to the United States, and mainly for economic reasons – the possibility of finding work and augmenting income - and, to a certain extent, for political reasons, such as the threat of illegal armed groups. Typical of this migration was the level of education of the migrants, their good knowledge of the English, a larger proportion of women than men and a considerable presence of middle and upper income class migrants. In the case of emigration to Spain, it increased considerably as of 1998, which was largely the result of Colombia's economic crisis in the years 1998-1999 and because of Spain's attraction as a place in which to join the collective immigrant workforce, as well as the advantage of the language. A large percentage of Colombian migrants in Spain are women, who have a medium educational level (see Table A6).

Ecuador and Colombia are neighboring countries and Table 6 indicates that the

[16] These results are obtained after controlling for differences in socioeconomic characteristics. A similar message is obtained when the models are estimated without including the additional controls.

[17] Note that this group was only in the 24^{th} position in 2001 (Table A7).

economic cost of migrating from any of the two countries to Spain is similar. Accordingly, large differences in birth outcomes are not expected among the children of those immigrants. Table 14 reveals a small, though statistically significant, disadvantage for children born to Colombian immigrants in terms of gestational age. However, this disadvantage does not translate into other birth outcomes. Indeed, differences in birth weight, the probability of low birth weight and that of dying before 24 hours are not statistically significant.[18]

Large-scale immigration from Romania and Bulgaria coincided with their inclusion in the list of countries exempted from the general visa requirements in early 2002 as a first step towards their membership of the EU. As for the economic aspects, both countries were by far the poorest of the 27 countries that would be part of the enlarged EU after January 2007, making emigration an attractive mean of improving the prospects for both the emigrants themselves and of those staying behind. Table 6A indicates that immigrants from Bulgaria and Rumania are comparable in terms of socioeconomic characteristics.

Bulgaria shares its northern border with Romania and Table 6 indicates that the economic cost of migrating from any of the two countries to Spain is similar and much lower than the cost of migrating from Ecuador. Table 15 compares the birth outcomes of all the four different immigrant groups considered here. The excluded category are Ecuadorian immigrants. Consistent with the hypothesis that selection is inversely proportional to distance, children born to immigrants from Romania and Bulgaria are lighter than those born to Ecuadorian immigrants (i.e. 53.20 grams and 34.45 grams respectively) and these differences are statistically significant at any level of significance. Differences in terms of other birth outcomes between Bulgarian and Ecuadorian immigrants are not statistically significant.

From the previous results we can conclude that immigrants originating from more remote areas are healthier (in terms of birth weights) than those from neighboring ones. This evidence indicates that selection plays a role in determining who migrates and who does not, and can partly explain the large health advantage observed among recent Ecuadorian immigrants in Spain.

B) *Differences in fertility*

Differences in the fertility behavior of immigrants and natives may have implications for the previous results. Migration may affect the fertility pattern of families through several channels (Blau 1992). The assimilation mechanisms predicts that different tastes or family size preferences formed in the origin country can explain initial differences in fertility between natives and immigrants. Over time, immigrants are likely

[18]The sample period has been extended to the years 2001-2005. The main reason is that these other immigrant groups, in particular Bulgarians, arrived mostly between 2003-2004.

to alter their reproductive behavior to conform to childbearing practices in the host country. In the case of high-fertility source countries, the fertility of immigrant women is expected to exceed that of their native-born counterparts initially but approach to native fertility over time (see Kahn 1994 and Ben-Porath 1973).

Migration however may have disruptive effects on fertility. The postponement of fertility can arise from, at least, two reasons. First, the economic resources of the household can temporary decrease, and fertility will fall as a results of a negative income effect. Second, fertility may also decrease due to demographic factors such as delayed marriages or temporary separation of couples. If disruption occurs, the fertility of recent immigrants will be low, and progressively increase to achieve the desired level (see Ford 1990 and Adserà and Ferrer 2013).

Finally, differences in fertility may also result from selection. Immigrant women may be a self-selected group whose fertility is low relative to others in the source country due to either tastes or to characteristics associated to labor market success. These women may also have a stronger preferences to invest in child quality and reduce quantity (Schultz 1984).

I first explore differences between natives and immigrants in the probability of having a children upon arrival to the country. To this aim, I estimate the following fertility model:

$$infant_i = \beta_0 + \beta_1 I_{1i} + \beta_2 ysm_i + \theta X_i + u_i \tag{10}$$

where the dependent variable $infant_i$ is an indicator for the presence of an infant in the household (i.e. a child younger than 1 year old). I_{1i} is the foreign-born indicator, ysm_i captures years since arrival in the country, X_i is a vector of mother's controls that include education, marital status, fertility history, and labor supply. The model also includes a set of dummies for the age of the mother, and province and year indicators. To further explore differences in the fertility the model is also estimated by replacing the presence of an infant by the total number of children younger than 17 ($children_i$) at the time of the interview.

Equation (10) is estimated using data from the Spanish Labor Force Survey (Encuesta de Población Activa, EPA) for the year 2001 to 2003 and Ecuador (Encuesta Nacional de Empleo, Desempleo y Subempleo, EMENDU) for the year 2001. Most of the analysis is conducted on a sample of recent immigrants (with less than 4 years of residence in the country).[19]

Table 16 presents the first set of results, where the fertility behavior of Ecuadorian immigrants is compared to that of natives in Spain. The first column displays the raw estimated difference in the propensity of having an infant between 2001 and 2003, and thus being part of sample employed in the estimation of the healthy immigrant

[19] To investigate the robustness of the results, the model is also estimated in an extended period (2000-2004) and including also immigrants with larger experience in the country.

effect. The estimate reveals a 4 percentage points higher probability for Ecuadorian immigrants. This positive gap in fertility remains after controlling for years since migration (column 2) and socioeconomic characteristics (column 3).[20] In column (4) the time period is extended to include the year 2000 and 2004 and column (5) adds to the analysis immigrants with longer experience in the country. All the specifications indicate a statistically significant and positive effect of being an Ecuadorian immigrant on the probability of having an infant, with a magnitude that oscillates between 3.3 and 4.2 percentage points. Column (6) and (7) explore differences in total fertility (i.e. number of children at the time of the interview). The columns also reveal a higher fertility among Ecuadorian immigrants in terms of total number of children. In addition, there is a positive effect on the total number of children related to the number of years in the country.

The higher fertility of Ecuadorian immigrants upon arrival is likely to respond to cultural differences. Ecuador is a high-fertility country (the average number of children per women was 5.1 in 1980, 3.7 in 1990, 3 in 2000 and 2.5 in 2010), while Spain is a low-fertility one (the average number of children per women was 2.2 in 1980, 1.3 in 1990, 1.2 in 2000 and 1.4 in 2010).[21] The high-fertility context in which Ecuadorian immigrants were reared may have shaped their preferences for large families. Moreover the positive effect of years since migration on the total number of children indicates that upon arrival the fertility of Ecuadorian immigrants may be below desired levels due to the presence of some disruptive effects associated to the migration episode. On the whole, these results suggest that the stronger preferences for larger families observed among immigrants should produce, if any, a negative bias in the estimated health gap reported in the previous section. Moreover, the existence of disruptive effects, if arising from economic difficulties, would reinforce the negative sign of the bias.

Given the high levels of fertility in Ecuador, the results in Table 16 could also be consistent with the presence of immigrant selection. That is, immigrants have a higher fertility rate than natives in Spain but still lower that those in Ecuador. Table 17 compares the fertility behavior of immigrants to that of non-immigrants in Ecuador. Column (1) to (3) presents the results for the probability of having an infant, while column (4) presents the estimates for total fertility. In all the specifications, the fertility of immigrants is lower than that of natives. Immigrants to Spain between 2001 and 2003 have a probability 7 to 8 percentage points lower of having an infant and the total number of children is also smaller (i.e. on average, immigrant women have 0.5 less children than non-immigrants). Moreover these differences do not change

[20] The Labor Force Survey allows us to include in estimation as controls the education of the mother, her marital status, the presence of previous children and an indicator for whether the woman is employed.

[21] World Bank indicators.

with years in the country. These results reinforce the view that immigrants to Ecuador are selected on the basis of characteristics that lead to lower fertility and probably to higher child quality.

Finally, Table 18 explores differences in the fertility between recent immigrants from Ecuador and Romania. First note that while Ecuador should be classified as a high-fertiltiy country, Romania belongs to the low-fertility group (i.e. 2.4 in 1980, 1.8 in 1990, 1.3 in 2000 and 1.3 in 2010). The first two columns in Table 18 show the estimated difference in the probability of having an infant during the period 2001-2003 among recent immigrants. The estimates reveal that the probability of having a child upon arrival is significantly higher among immigrants from Ecuador. Regarding total fertility (column (3) and (4)) the positive initial effect in favor of Ecuadorian immigrants remains, though the number of children increases with years in the country for the two groups at a similar rate.

The initial disadvantage in terms of fertility for Romanians is consistent with both the presence of disruptive effects and with the behavior of immigrants originating from low-fertility countries. While the presence of disruptive effects can not be rule out, the estimates in Table 18 suggest that, if any, they should equally affect the fertility of both ethnic groups (i.e. the groups specific coefficient on *years since migration* is never significant). Accordingly, while the initial fertility of both immigrant groups may be below the desired level, the lower fertility of Romanians persists over time. Hence the fertility pattern of Romanians is then consistent with the assimilation mechanism of immigrants originating from a low-fertility countries. As a result, the positive health advantage in favor of Ecuadorian immigrants with respect to immigrants from Romania will be, if any, underestimated as a result of the stronger preferences of Romanians for less children (more quality).

VII. Conclusions

This paper presents new empirical evidence on the determinants of the health advantage observed among recent immigrants. It employs evidence from a large migration inflow of Ecuadorian to Spain in the early 2000s. Using the Vital Statistics in both countries, I document an important health advantage for immigrants in terms of birth weights and other birth outcomes. The comparison to other recent minority groups in Spain suggests that this advantage is likely to be driven by the positive selection of Ecuadorian immigrants in terms of health.

The findings in this paper have at least two important policy implications. First, the health advantage of immigrant children at birth may translate into an advantage in terms of education and earnings that may compensate some of negative effects associated to migration (i.e. discrimination, lower economic resources or poorer net-

work quality). Second, immigration is not likely to represent a financial burden on the public health system, as long as the health advantage of recent immigrants does not deteriorate over time.

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Tables

Table 1: Stock of immigrants in Spain (2000-2012)

Year	**Total Population**	**Foreign born**	**Born in Ecuador**	**Born in Romania**
2000	40,499,790	1,472,458	21,736*	7,543
2001	41,116,842	1,969,270	140,631	33,044
2002	41,837,894	2,594,052	259,779	68,561
2003	42,717,064	3,302,440	387,565	137,834
2004	43,197,684	3,693,806	470,090	206,395
2005	44,108,530	4,391,484	487,239	312,099
2006	44,708,964	4,837,622	456,641	397,270
2007	45,200,737	5,849,993	434,673	510,983
2008	46,157,822	6,044,528	458,437	706,164
2009	46,745,807	6,466,278	479,117	762,163
2010	47,021,031	6,604,181	484,623	784,834
2011	47,190,493	6,677,839	480,626	810,348
2012	47,265,321	6,759,780	471,640	833,764

Source: Local Municipality Registry. Spanish Statistical Office.
Notes:(*) The numbers for 2000 are likely to underestimate the stock of immigrants. Only after the approval of the new immigration law (Ley Organica 4/2000), immigrants (legal and illegal) had incentives to register to gain access to the public health and education system and to document their residence in Spain for future amnesties.

Table 2: Births by nationality occurred in Spain

		By nationality of the mother*		
	Total number of births	**Foreign**	**Ecuadorian**	**Romanian**
2000	397,632	6.2	0,65	0,14
2001	406,380	8.24	1,39	0,25
2002	418,846	10.55	2,01	0,50
2003	441,881	12.23	2,38	1,11
2004	454,591	13.78	2,44	1,27
2005	466,371	15.07	2,13	1,48
2006	482,957	16.54	1,88	1,82
2007	492,527	18.98	1,89	2,35
2008	519,779	20.81	1,84	2,62
2009	494,997	20.72	1,65	2,41
2010	486,575	20.55	1,39	2,55
2011	471,999	19.51	1,13	2,46

Source: Vital Statistics. Spanish Statistical Office.
Note: *Percentage of birth by nationality over the total number of births

Table 3: Descriptive Statistics: Birth weight by nationality in Spain

	Native	Foreign	Ecuadorian	Moroccan	Romanian
2000	3,243.86 (484.32)	3,298.24 (524.00)	3,238.28 (521.68)	3,378.89 (520.04)	3,254.24 (516.47)
2001	3,236.50 (484.39)	3,292.50 (513.56)	3,273.47 (489.08)	3,360.48 (520.50)	3,219.54 (517.83)
2002	3,233.54 (486.85)	3,294.82 (517.33)	3,275.26 (497.51)	3,356.11 (522.58)	3,230.73 (564.14)
2003	3,232.32 (484.84)	3,298.35 (521.07)	3,282.09 (512.28)	3,353.89 (520.98)	3,231.90 (544.87)
2004	3,236.86 (484.10)	3,308.54 (521.99)	3,313.38 (508.73)	3,361.70 (532.63)	3,227.89 (538.54)
2005	3,233.93 (487.75)	3,317.62 (523.97)	3,317.80 (516.43)	3,369.33 (514.55)	3,248.96 (551.11)

Source: Vital Statistics. Spanish Statistical Office.
Note: Mean and standard deviation of birth weights to mothers 15 to 49, excluding multiple births and newborns whose weight was either under 500 grams or above 9,000 grams.

Table 4: Aggregate Health Statistics (World Bank), year 2000

	Spain	**Ecuador**	**Romania**
Body mass Index			
Male	26,6	25	24,7
Female	26	26,4	24,9
Life Expectancy in years	83	76	75
Infant Mortality Rate	6	28	23
Child Mortality Rate	6	31.4	23.8
Low-birth weight probability	6	16	9
Average birth weight	3,214 grams	3,102 grams	3,186 grams

Note: Infant mortality rate is the probability of dying between birth and age ; per 1000 live births. Child Mortality Rate is the probability of dying before age 5; per 1000 live births

Table 5: Descriptive Statistics: Birth weight (Immigrants in Spain and Non-Immigrants in Ecuador)

	Immigrants	**Non-immigrants**
2000	3,238.28 (521.68)	3,110.32 (542.41)
2001	3,273.47 (489.08)	3,098.76 (520.54)
2002	3,275.26 (497.51)	3,116.40 (515.25)
2003	3,282.09 (512.28)	3,117.55 (471.67)
2004	3,313.38 (508.73)	3,058.35 (403.26)
2005	3,317.80 (516.43)	3,070.07 (421.47)

Source: Vital Statistics. Ecuadorian Statistical Office and Spanish Statistical Office
Note: Information on birth weights for immigrants is taken from the Vital Statistics in Spain, while that for non-immigrants comes from the Vital Statistics in Spain.

Table 6: Economic cost of migration in Euros by country of origin

Year of arrival	Ecuador	Romania	Colombia	Bulgaria
1999-2003	1609.72€	464.95€	1363.54€	384.20€
	(1070.75)	(536.55)	(978.73)	(562.19)
Nobs	993	665	592	190
1999-2007	1591.76€	398.22€	1358.98€	345.56€
	(1057.31)	(438.03)	(1007.90)	(488.28)
Nobs	1062	1154	717	267

Source: Encuesta Nacional de Inmigrantes 2007.

Note: Economic cost of migration per person to move from the country of origin to destination. It includes transport costs, all types of travel allowances (food, accomodation, etc...), visa and any type of related document, and any other payment realted to the migration episode. The average cost has been computed using the weights provided in the survey, so that the sample means are representative of each minority group in the country.

Table 7: Evidence of the Healthy Immigrant Effect

	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003
Immigrant from Ecuador	89.082*** [6.853]	84.973*** [5.714]	91.214*** [5.101]
Male	118.787*** [1.624]	115.994*** [1.624]	116.476*** [1.586]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Province dummies	YES	YES	YES
Constant	3,029.677*** [28.024]	3,009.225*** [28.769]	3,075.785*** [27.688]
R-squared	0.023	0.021	0.021
Observations	348,050	352,719	367,320

Source: Vital Statistics. Spanish Statistical Office
Note: OLS estimates of the linear model in equation (1)

Table 8: Evidence of the Healthy Immigrant Effect (additional controls)

	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003
Immigrant from Ecuador	99.476***	95.181***	98.001***
	[6.869]	[5.748]	[5.141]
Male	118.559***	115.868***	116.292***
	[1.618]	[1.618]	[1.581]
Born at a hospital	36.986***	43.886***	14.482
	[13.193]	[13.374]	[12.897]
Presence of previous children	95.410***	90.660***	88.334***
	[3.387]	[3.410]	[3.339]
Number of previous children	3.828**	6.297***	6.991***
	[1.828]	[1.866]	[1.847]
Married	49.602***	47.667***	44.513***
	[2.311]	[2.246]	[2.137]
Working	13.390***	19.069***	17.496***
	[1.893]	[1.888]	[1.848]
Working in a high skilled occupation	20.492***	18.051***	20.318***
	[2.380]	[2.346]	[2.250]
Years since the last birth	-4.242***	-5.009***	-4.553***
	[0.384]	[0.389]	[0.386]
Constant	2,994.085***	2,968.485***	3,063.172***
	[30.832]	[31.556]	[30.457]
R-squared	0.031	0.029	0.029
Observations	347,808	352,444	367,017

Source: Vital Statistics. Spanish Statistical Office

Note: OLS estimates of the linear model in equation (1), included in estimation are also the gender of the child, the set of age dummies for the mother, and monthly and province dummies.

Table 9: Evidence of the Healthy Immigrant Effect (Other birth outcomes)

	Low birth Weight	Gestational age	Normal term (38-42 weeks)	Pre-term birth	Death before 24 hours
Immigrant from Ecuador	-0.020***	0.043***	0.010***	-0.011***	-0.000
	[0.002]	[0.016]	[0.003]	[0.003]	[0.000]
Male	-0.011***	-0.061***	-0.010***	0.010***	0.000**
	[0.001]	[0.004]	[0.001]	[0.001]	[0.000]
Born at a hospital	-0.014***	0.015	0.032***	-0.031***	-0.003***
	[0.004]	[0.037]	[0.007]	[0.007]	[0.001]
Presence of previous children	-0.029***	-0.022**	0.020***	-0.020***	-0.001***
	[0.001]	[0.009]	[0.002]	[0.002]	[0.000]
Number of previous children	0.004***	-0.055***	-0.013***	0.013***	0.000
	[0.001]	[0.005]	[0.001]	[0.001]	[0.000]
Married	-0.017***	0.085***	0.014***	-0.014***	-0.001***
	[0.001]	[0.006]	[0.001]	[0.001]	[0.000]
Working	-0.007***	0.017***	0.007***	-0.007***	-0.001***
	[0.001]	[0.005]	[0.001]	[0.001]	[0.000]
Working in a high skilled occupation	-0.008***	-0.003	0.008***	-0.008***	0.000
	[0.001]	[0.006]	[0.001]	[0.001]	[0.000]
Years since the last birth	0.002***	0.004***	-0.001***	0.001***	0.000
	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Constant	0.119***	38.739***	0.799***	0.197***	0.002*
	[0.010]	[0.084]	[0.016]	[0.016]	[0.001]
R-squared	0.005	0.009	0.007	0.007	0.001
Observations	700,252	635,053	635,053	635,053	635,242

Source: Vital Statistics. Spanish Statistical Office

Note: OLS estimates of the linear model in equation (1), included in estimation are also the gender of the child, the set of age dummies for the mother, monthly and province dummies. Time period 2001-2002.

Table 10: Difference in the birth weight of immigrants in Spain and non-immigrants in Ecuador

	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003
Immigrant from Ecuador	168.033*** [7.319]	148.361*** [5.984]	158.466*** [4.948]
Male	75.108*** [2.643]	74.230*** [2.477]	74.435*** [2.345]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Constant	3,001.450*** [14.206]	2,986.936*** [12.662]	3,010.979*** [11.837]
R-squared	0.014	0.016	0.02
Observations	153,088	170,637	161,451

Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes non-immigrants in Ecuador and Ecuadorian immigrants in Spain

Table 11: Difference in birth weight of immigrants in Spain and non-immigrants in Ecuador

	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003
Being born in Spain	108.381***	84.678***	83.277***
	[1.713]	[1.680]	[1.668]
Immigrant from Ecuador	59.980***	64.226***	73.758***
	[6.920]	[5.724]	[4.966]
Male	105.367***	102.466***	103.949***
	[1.398]	[1.373]	[1.327]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Constant	2,976.830***	2,968.848***	2,993.354***
	[11.851]	[10.927]	[10.706]
R-squared	0.03	0.026	0.027
Observations	495,951	515,666	519,074

Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes non-immigrants in Ecuador, Ecuadorian immigrants in Spain, and natives in Spain

Table 12: Difference in birth weight of immigrants in Spain and non-immigrants in Ecuador (additional controls)

	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003
Being born in Spain	142.155***	115.350***	109.272***
	[1.881]	[1.850]	[1.829]
Immigrant from Ecuador	48.137***	50.653***	60.358***
	[6.908]	[5.723]	[4.970]
Male	105.398***	102.325***	103.904***
	[1.393]	[1.369]	[1.325]
Being born at a hospital	-129.116***	-71.150***	-8.961*
	[5.194]	[4.932]	[5.383]
Presence of previous children	63.633***	56.133***	55.051***
	[2.030]	[1.998]	[1.952]
Number of previous children	7.050***	8.461***	7.741***
	[1.000]	[0.977]	[0.980]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Constant	3,091.274***	3,029.577***	2,994.994***
	[12.800]	[11.855]	[11.853]
R-squared	0.036	0.031	0.031
Observations	495,951	515,666	519,074

Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes non-immigrants in Ecuador, Ecuadorian immigrants in Spain, and natives in Spain

Table 13: Comparing immigrants from Ecuador and Romania in Spain

	Birth Weight	Low birth Weight	Gestational age	Normal term birth (38-42 weeks)	Preterm birth	Death before 24 hours
Immigrant from Ecuador	49.190*** [8.376]	-0.023*** [0.004]	0.165*** [0.033]	0.037*** [0.006]	-0.037*** [0.006]	-0.002*** [0.001]
Male	102.392*** [5.994]	-0.007*** [0.003]	-0.013 [0.023]	-0.008* [0.004]	0.008* [0.004]	0.000 [0.000]
Being born at a hospital	129.038*** [36.232]	-0.048*** [0.016]	0.373*** [0.143]	0.056** [0.026]	-0.057** [0.026]	-0.005* [0.002]
Presence of previous children	27.286** [12.391]	-0.004 [0.006]	-0.097** [0.048]	-0.005 [0.009]	0.005 [0.009]	0.001 [0.001]
Number of previous children	23.367*** [4.986]	-0.001 [0.002]	0.011 [0.019]	-0.000 [0.004]	0.000 [0.004]	-0.000 [0.000]
Married	34.215*** [6.418]	-0.010*** [0.003]	0.139*** [0.025]	0.021*** [0.005]	-0.020*** [0.005]	-0.000 [0.000]
Working	-2.482 [6.953]	0.005* [0.003]	-0.047* [0.027]	0.001 [0.005]	-0.000 [0.005]	-0.000 [0.000]
Working in a high skilled occupation	1.009 [17.637]	-0.003 [0.008]	0.013 [0.069]	-0.001 [0.013]	0.002 [0.013]	0.000 [0.001]
Years since the last birth	-0.009 [1.364]	0.000 [0.001]	0.008 [0.005]	0.001 [0.001]	-0.001 [0.001]	-0.000 [0.000]
Constant	2,875.295*** [86.479]	0.137*** [0.039]	38.140*** [0.332]	0.765*** [0.061]	0.237*** [0.061]	0.003 [0.006]
Observations	28,603	28,603	26,775	26,775	26,775	26,787
R-squared	0.029	0.007	0.019	0.016	0.016	0.004

Source: Vital Statistics. Spanish Statistical Office

Note: The sample includes children born to Ecuadorian and Romanian mothers in Spain between the period 2001 and 2003.

Table 14: Comparing immigrants from Ecuador and Colombia in Spain

	Birth Weight	Low birth Weight	Gestational age	Normal term birth (38-42 weeks)	Preterm birth	Death before 24 hours
Immigrant from Ecuador	-7.441 [4.610]	0.002 [0.002]	0.051*** [0.018]	0.007** [0.003]	-0.007** [0.003]	0.000 [0.000]
Additional controls	YES	YES	YES	YES	YES	YES
Constant	3,022.848*** [54.210]	0.085*** [0.023]	38.204*** [0.204]	0.744*** [0.038]	0.253*** [0.038]	0.001 [0.003]
Observations	62,944	62,944	58,730	58,730	58,730	58,761
R-squared	0.028	0.004	0.012	0.009	0.009	0.002

Source: Vital Statistics. Spanish Statistical Office

Note: The sample includes children born to Ecuadorian and Colombian immigrants in Spain between 2001 and 2005.

Table 15: Comparing different immigrants groups in Spain

	Birth Weight	Low birth Weight	Gestational age	Normal term birth (38-42 weeks)	Preterm birth	Death before 24 hours
Immigrant from Romania	-53.202*** [5.232]	0.027*** [0.002]	-0.186*** [0.020]	-0.039*** [0.004]	0.039*** [0.004]	0.001*** [0.000]
Immigrants from Colombia	6.925 [4.617]	-0.002 [0.002]	-0.045** [0.018]	-0.008** [0.003]	0.008** [0.003]	-0.000 [0.000]
Immigrants from Bulgaria	-34.447*** [9.822]	0.004 [0.004]	-0.053 [0.038]	-0.009 [0.007]	0.009 [0.007]	0.000 [0.001]
Additional controls	YES	YES	YES	YES	YES	YES
Constant	2,983.728*** [47.423]	0.108*** [0.021]	38.263*** [0.182]	0.744*** [0.034]	0.254*** [0.033]	0.001 [0.003]
Observations	82,975	82,975	77,075	77,075	77,075	77,121
R-squared	0.028	0.005	0.015	0.014	0.014	0.002

Source: Vital Statistics. Spanish Statistical Office
Note: The sample includes children born to Ecuadorian, Colombian, Bulgarian and Romanian immigrants in Spain between 2001 and 2005.

Table 16: The fertility of Ecuadorian immigrants and natives in Spain

	Infant	Infant	Infant	Infant	Infant	Total fertility	Total fertility
Immigrant from Ecuador	0.037***	0.033***	0.042***	0.041***	0.034***	0.150***	0.163***
	[0.008]	[0.013]	[0.013]	[0.009]	[0.007]	[0.040]	[0.023]
Years since migration		0.002	0.005	-0.004	0	0.058***	0.042***
		[0.007]	[0.007]	[0.003]	[0.002]	[0.021]	[0.006]
Primary education			-0.040***	-0.042***	-0.042***	-0.018***	-0.020***
			[0.001]	[0.001]	[0.001]	[0.004]	[0.003]
Secondary education			-0.027***	-0.029***	-0.029***	-0.052***	-0.050***
			[0.001]	[0.001]	[0.001]	[0.005]	[0.004]
Married			0.073***	0.075***	0.075***	0.453***	0.467***
			[0.001]	[0.001]	[0.001]	[0.004]	[0.003]
Work			-0.035***	-0.034***	-0.034***	-0.172***	-0.172***
			[0.001]	[0.001]	[0.001]	[0.003]	[0.003]
Previous children			-0.052***	-0.053***	-0.053***		
			[0.001]	[0.001]	[0.001]		
Constant	0.830***	0.830***	0.838***	0.610***	0.610***	0.469	0.359*
	[0.102]	[0.102]	[0.101]	[0.066]	[0.066]	[0.319]	[0.210]
Time period	2001-2003	2001-2003	2001-2003	2000-2004	2000-2004	2001-2003	2000-2004
Sample	Native and recent immigrants	Native and recent immigrants	Native and recent immigrants	Native and recent immigrants	Native and all immigrants	Native and recent immigrants	Native and all immigrants
R-squared	0.082	0.082	0.101	0.1	0.1	0.253	0.252
Observations	266,491	266,491	266,491	448,670	448,824	266,491	448,824

Source: Spanish Labor Force Survey

Note: Estimates from the linear probability model in equation (2). Infant is an indicator for the presence of an infant (1 year old or less) at the time of the interview. Total fertility is the total number of children at the time of the interview. The sample includes immigrants from Ecuador in Spain and natives in Spain.

Table 17: The fertility of Ecuadorian immigrants in Spain and non-immigrants in Ecuador

	Infant	Infant	Infant	Total fertility
Immigrant from Ecuador	-0.061***	-0.079***	-0.083***	-0.487***
	[0.013]	[0.020]	[0.021]	[0.062]
Years since migration		0.012	0.016	0.007
		[0.011]	[0.011]	[0.033]
Primary education			0.051***	0.733***
			[0.011]	[0.033]
Secondary education			0.017	0.277***
			[0.012]	[0.035]
Married			0.049***	0.224***
			[0.011]	[0.032]
Work			-0.050***	0.002
			[0.008]	[0.024]
Previous children			-0.058***	
			[0.010]	
Constant	0.286***	0.286***	0.221***	-0.547**
	[0.081]	[0.081]	[0.082]	[0.245]
Time period	2001-2003	2001-2003	2001-2003	2001-2003
Sample	Non-immigrants and recent immigrants	Non-immigrants and recent immigrants	Non-immigrants and recent immigrants	Non-immigrants and recent immigrants
R-squared	0.113	0.113	0.125	0.453
Observations	9,401	9,401	9,397	9,397

Source: Spanish and Ecuadorian Labor Force Survey
Note: Estimates from the linear probability model in equation (2). Infant is an indicator for the presence of an infant (1 year old or less) at the time of the interview. Total fertility is the total number of children at the time of the interview. The sample includes non-immigrants in Ecuador and immigrants in Spain.

Table 18: The fertility of Ecuadorian and Romanian immigrants

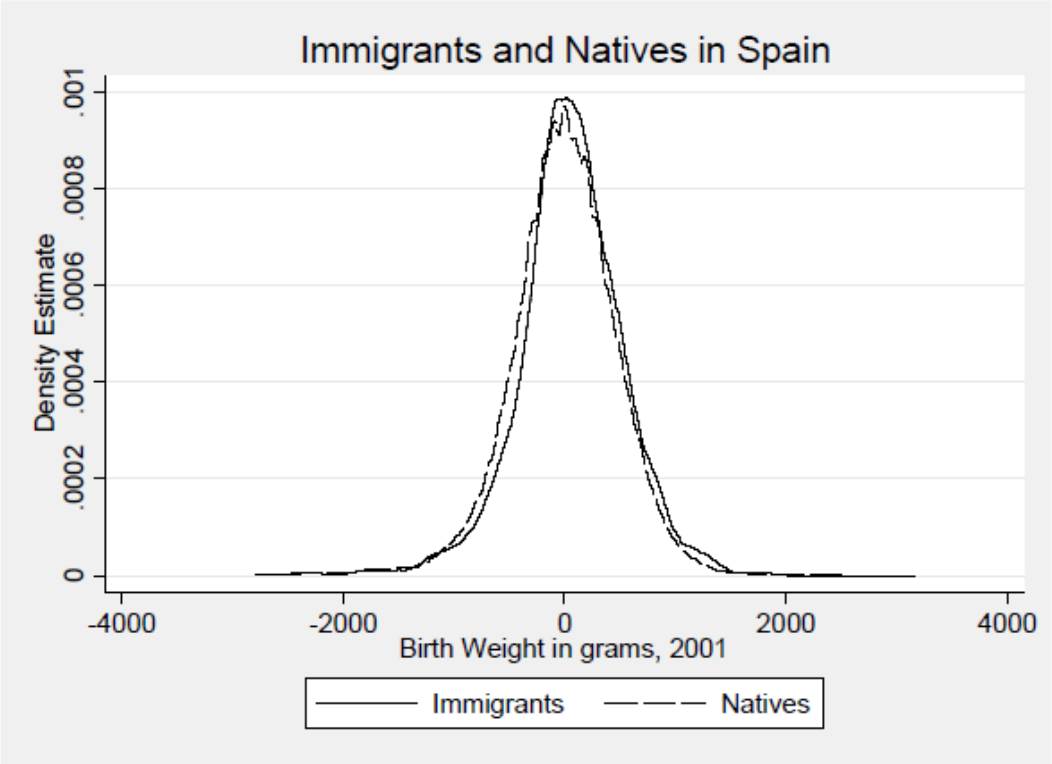
	Infant	Infant	Total fertility	Total fertility
Immigrant from Ecuador	0.066**	0.081*	0.521***	0.563***
	[0.032]	[0.043]	[0.057]	[0.056]
Years since migration	0.020**	0.016	0.010	0.022*
	[0.009]	[0.011]	[0.012]	[0.011]
Years since migration (immigrants from Ecuador)		0.010		0.032
		[0.019]		[0.019]
Primary	-0.062	-0.060	0.119**	0.115**
	[0.038]	[0.038]	[0.051]	[0.052]
Secondary	-0.052	-0.052	0.120**	0.121**
	[0.039]	[0.039]	[0.051]	[0.051]
Married	-0.057**	-0.056**	0.288***	0.291***
	[0.026]	[0.026]	[0.036]	[0.036]
Work	-0.141***	-0.142***	-0.266***	-0.262***
	[0.025]	[0.025]	[0.034]	[0.034]
Children	0.117***	0.118***		
	[0.013]	[0.013]		
Constant	0.852***	0.843***	1.073***	1.069***
	[0.286]	[0.286]	[0.333]	[0.333]
Time period	2001-2003	2001-2003	2000-2004	2000-2004
Sample	Recent immigrants	Recent immigrants	All immigrants	All immigrants
R-squared	0.313	0.313	0.250	0.251
Observations	857	857	3,264	3,264

Source: Spanish Labor Force Survey

Note: Estimates from the linear probability model in equation (2). Infant is an indicator for the presence of an infant (1 year old or less) at the time of the interview. Children is the total number of children at the time of the interview. The sample includes immigrants from Ecuador and from Romania in Spain.

Figure 1:

a) Birth weight distribution of immigrants and natives in Spain (2001)



Note: The graph represents the kernel density estimate of the residuals from a regression of birth weight on a set of dummeis for the age of the mother at birth, a set of month of birth indicator and a gender dummy. The value of the Kolmogovrov-Smirnov test for the equality of the two distributions is 0.1735.

b) Difference in the birth weight distribution between immigrants and natives in Spain (2001)

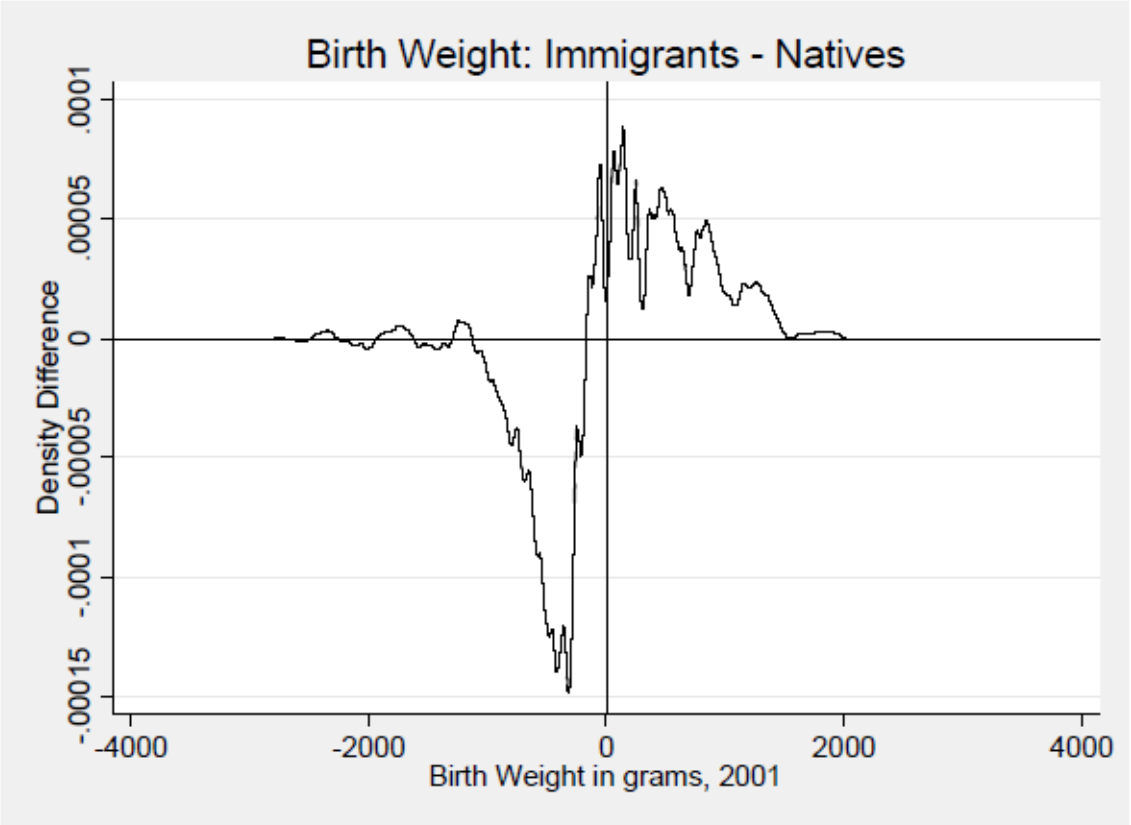
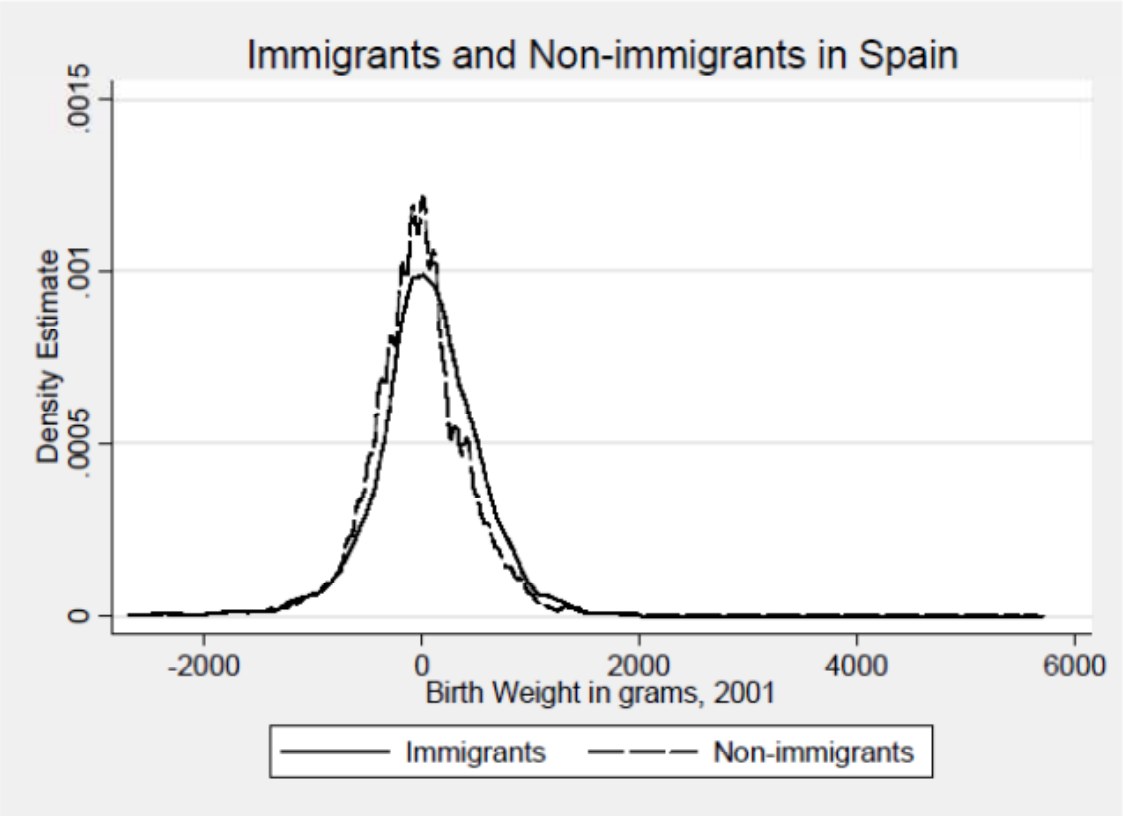


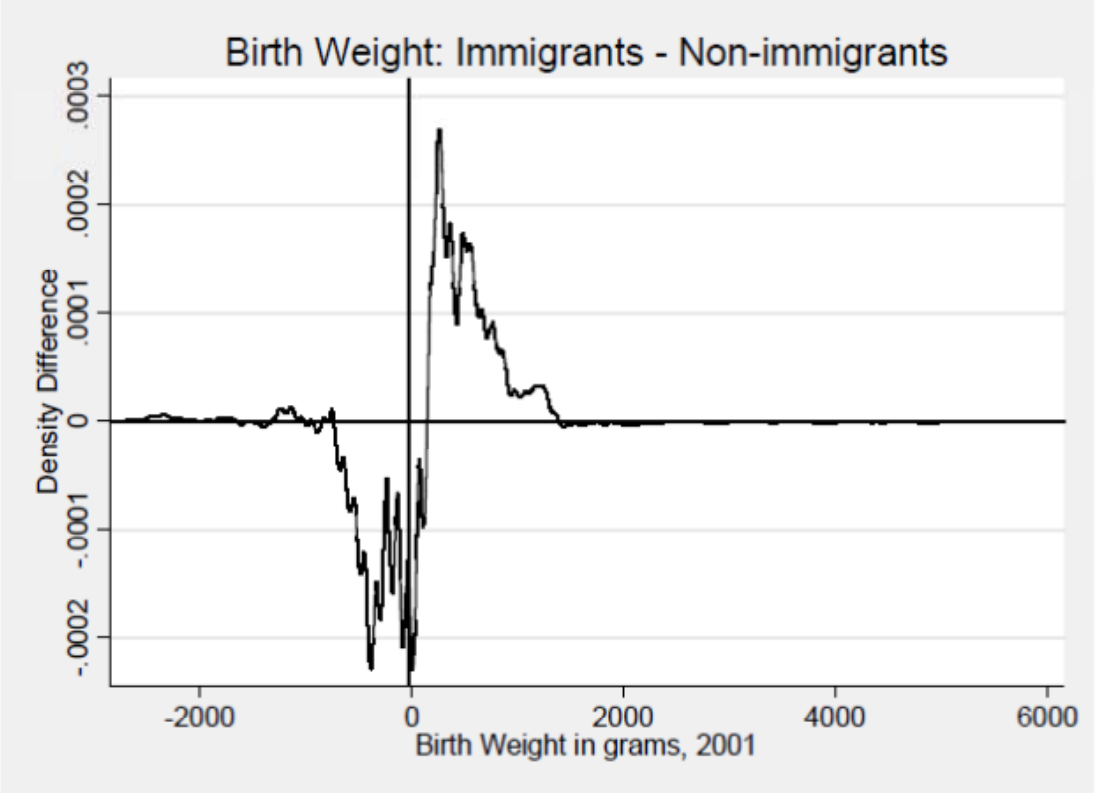
Figure 2:

a) Birth weight distribution of immigrants in Spain and non-immigrants in Ecuador (2001)



Note: The graph represents the kernel density estimate of the residuals from a regression of birth weight on a set of dummies for the age of the mother at birth, a set of month of birth indicator and a gender dummy. The value of the Kolmogovrov-Smirnov test for the equality of the two distributions is 0.4398.

b) Difference in the birth weight distribution (2001)



Appendix

Table A1: Years since arrival by country of origin

	Immigrants	Ecuador	Morocco	Romania	Colombia	Bulgaria
before 2000	42.84	16.91	60.14	11.69	22.93	15.23
year 2000	12.87	22.81	10.58	12.78	21.91	16.30
year 2001	14.00	22.40	9.99	16.85	26.87	20.81
year 2002	13.06	19.98	7.64	21.34	19.51	20.74
year 2003	9.85	13.89	5.83	20.23	5.02	15.41
year 2004	7.39	4.01	5.82	17.09	3.77	11.51
Nobs	116,235	16,490	17,572	10,176	10,507	2,816

Source: EPA 2000-2011
Note: % per year of arrival until 2004

Table A2: Missing birth weight information in the Vital Statistics for Ecuador

	2001		2009	
	Number of observations	% with missing information on birth weight	Number of observations	% with missing information on birth weight
Year recorded:				
Same year	192,786	43.61%	215,906	15.49%
One year after	85,384	53.73%	82,431	22.98%
Gender:				
female	137,112	44.34%	145,739	17.35%
male	141,058	44.51%	152,499	17.76%
Education:				
No education	41,470	62.67%	6,940	42.69%
Primary	116,291	53.83%	113,745	27.78%
Higher	120,409	29.06%	151,808	8.92%
Area:				
Urban	229,043	37.97%	267,509	11.65%
Rural	40,432	73.48%	27,565	67.33%
Periphery	4,350	84.20%	2,668	81.77%
Assisted by:				
Health professional	253,848	40.10%	268,068	9.11%
Other	24.322	89.52%	21,654	91.57%
Place born:				
Public hospital or similar	116,112	27.90%	163,354	5.39%
Private hospital or similar	79.541	22.22%	90,800	4.50%
Other (house)	73.507	89.08%	44,183	89.38%

Source: Vital Statistics. Ecuadorian Statistical Office.

Table A3: The incidence of interethnic marriage

	Birth weight 2001	Birth weight 2002	Birth weight 2003
Immigrant from Ecuador (mother)	113.536***	99.637***	126.930***
	[14.768]	[12.361]	[10.622]
Father is not from Ecuador	14.939	1.188	31.807***
	[15.880]	[13.201]	[11.281]
Male	118.877***	115.999***	116.256***
	[1.626]	[1.627]	[1.588]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Province dummies	YES	YES	YES
Constant	3,000.633***	2,971.152***	3,037.293***
	[36.500]	[36.150]	[34.383]
R-squared	0.031	0.029	0.029
Observations	343,391	347,682	362,356

Source: Vital Statistics. Spanish Statistical Office

Note: OLS esimates of the linear model in equation (1) with the additional controls in Table 7

Table A4: Difference in low birth weight probability of immigrants in Spain and non-immigrants in Ecuador

	Low birth weight 2001	Low birth weight 2002	Low birth weight 2003
Being born in Spain	-0.003***	-0.003***	0
	[0.001]	[0.001]	[0.001]
Immigrant from Ecuador	-0.011***	-0.008***	-0.007***
	[0.003]	[0.003]	[0.002]
Male	-0.011***	-0.011***	-0.010***
	[0.001]	[0.001]	[0.001]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Constant	0.098***	0.099***	0.082***
	[0.006]	[0.005]	[0.005]
R-squared	0.002	0.002	0.001
Observations	496,221	515,946	519,360

Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes non-immigrants in Ecuador, Ecuadorian immigrants in Spain, and natives in Spain

Table A5: Difference in birth weight of immigrants in Spain and non-immigrants in Ecuador (Robustness Checks)

	Birth weight	Birth weight	Birth weight
Being born in Spain	125.870***	109.264***	127.373***
	[1.135]	[1.343]	[0.987]
Immigrant from Ecuador	39.999***	41.547***	38.194***
	[3.791]	[3.815]	[3.759]
Male	87.706***	89.654***	77.342***
	[0.841]	[0.817]	[0.518]
Being born at a hospital	-60.993***	-44.478***	-59.933***
	[3.078]	[3.842]	[1.643]
Presence of previous children	53.834***	46.843***	34.375***
	[1.226]	[1.206]	[0.743]
Number of previous children	5.441***	8.583***	10.066***
	[0.601]	[0.592]	[0.301]
Age dummies	YES	YES	YES
Monthly dummies	YES	YES	YES
Constant	3,013.552***	3,009.273***	3,014.001***
	[7.495]	[7.036]	[3.364]
Observations	1,011,617	1,084,721	2,646,270
R-squared	0.037	0.033	0.033

Note: Column (1) compares the birth weight of immigrants in Spain and non-immigrants in Ecuador for the year 2001/2002. Column (2) compares the birth weight of immigrants in Spain in 2001/2002 to non-immigrants in Ecuador in 2006/2007. Column (3) compares the birth weight of immigrants in Spain in 2001/2002 to non-immigrants in Ecuador for the period 2000 to 2010. In the three specifications the additional controls included are: year dummies, and dummies for the age of the mother and the month of birth

Table A6: Socio-economic characteristics of natives and immigrants in Spain (2000-2004)

	Natives (all)	Immigrants (all)	Ecuador (all)	Romania (all)	Colombia (all)	Bulgaria (all)	Ecuador (females)	Romania (females)	Colombia (females)	Bulgaria (females)
Age	38.91	35.96	31.52	31.33	34.04	34.23	31.54	30.98	34.68	34.44
Male	0.5	0.47	0.47	0.52	0.35	0.53				
Years since migration		5.56	2.29	2.17	2.80	2.33	2.29	2.02	2.91	2.31
Year of arrival		1997	2000	2001	2000	2000	2000	2001	2000	2001
Education:										
Primary	0.3	0.24	0.31	0.18	0.20	0.26	0.29	0.17	0.22	0.25
HS dropout	0.29	0.23	0.26	0.16	0.21	0.16	0.25	0.17	0.21	0.13
HS graduate	0.26	0.34	0.34	0.54	0.44	0.41	0.37	0.52	0.44	0.40
College	0.15	0.19	0.09	0.12	0.14	0.17	0.09	0.14	0.13	0.22
Work	0.57	0.63	0.76	0.74	0.68	0.72	0.7	0.64	0.62	0.60
High Occupation	0.12	0.11	0.01	0.01	0.04	0.03	0.01	0.01	0.03	0.01
Middle Occupation	0.18	0.13	0.01	0.02	0.05	0.01	0.01	0.03	0.05	0.02
Low Occupation	0.69	0.76	0.98	0.97	0.90	0.96	0.98	0.96	0.91	0.97
% with kids	0.36	0.53	0.74	0.49	0.64	0.47	0.76	0.49	0.64	0.45
Number of kids	1.47	1.66	1.76	1.45	1.55	1.43	1.79	1.42	1.56	1.45
Number of observations	2,216,983	85,476	7,066	3,777	5,900	1,119	3,712	1,800	3,808	528

Source: EPA 2000-2004

Table A7: Ranking of immigrant-sending countries to Spain

	Ecuador	Colombia	Romania	Bulgaria
2001	137,185 (2)	86,927 (5)	31,316 (10)	11,892 (24)
2002	255,350 (2)	190,226 (3)	66,226 (7)	29,424 (15)
2003	382,169 (1)	242,540 (3)	134,811 (5)	52,185 (10)
2004	463,737 (1)	246,243 (3)	203,173 (4)	68,795 (8)
2005	479,978 (1)	268,144 (4)	308,856 (3)	91,265 (9)

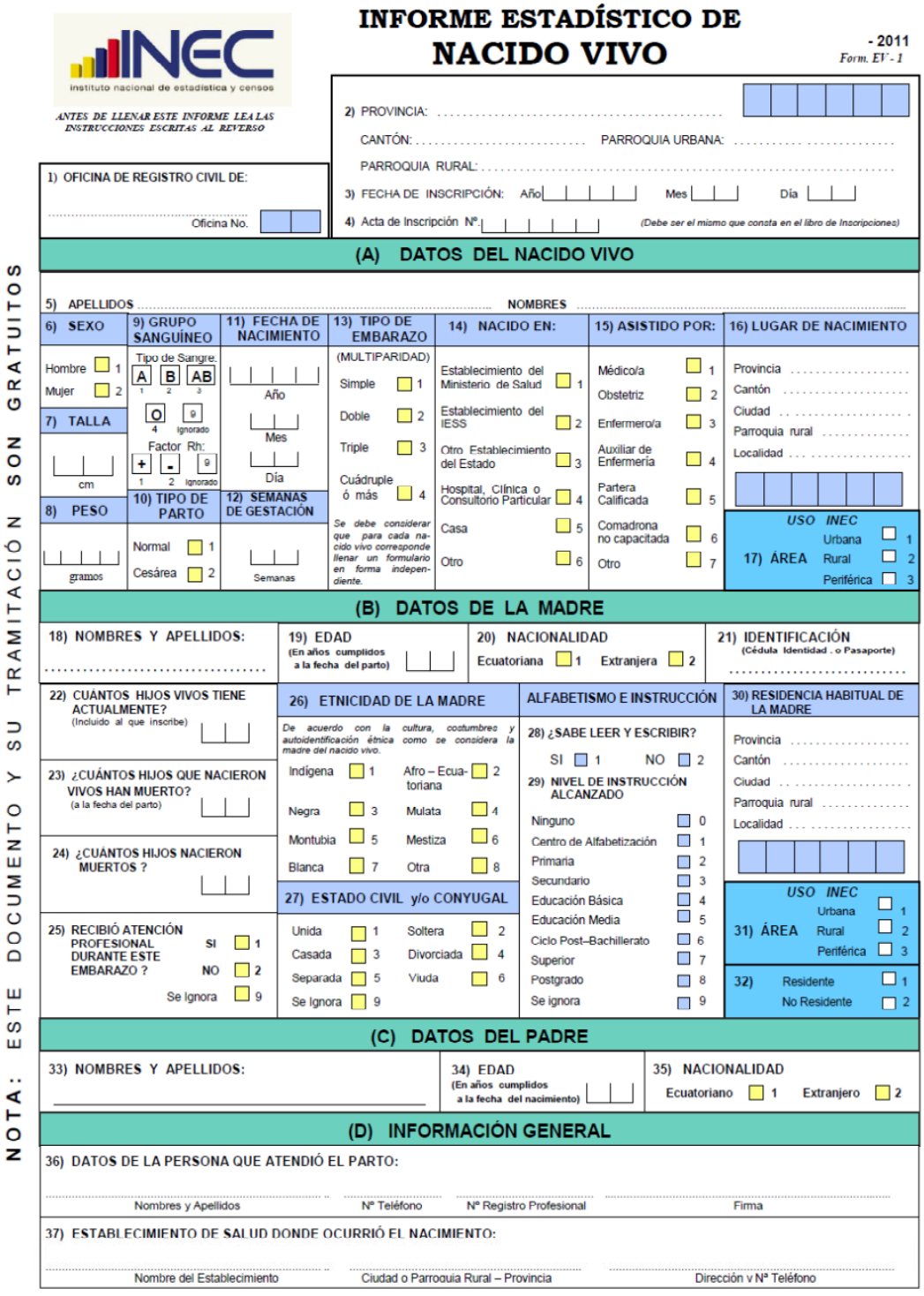
Source: Municipaly Registry (Padrón Municipal)

Table A8: Comparing immigrants from Bulgaria and Romania in Spain (2001-2005)

	Birth Weight	Low birth Weight	Gestational age	Normal term birth (38-42 weeks)	Preterm birth	Death before 24 hours
Immigrants from Bulgaria						
Additional controls	YES	YES	YES	YES	YES	YES
Constant	2,809.002*** [124.902]	0.188*** [0.057]	38.162*** [0.486]	0.764*** [0.090]	0.241*** [0.089]	-0.002 [0.008]
Observations	15,628	15,628	14,654	14,654	14,654	14,658
R-squared	0.032	0.010	0.024	0.019	0.018	0.007

Source: Vital Statistics. Spanish Statistical Office

Figure 1A: Administrative form completed in Ecuador to legalize a birth



INFORME ESTADÍSTICO DE NACIDO VIVO

- 2011

Form. EV - 1

instituto nacional de estadística y censos

ANTES DE LLENAR ESTE INFORME LEA LAS INSTRUCCIONES ESCRITAS AL REVERSO

2) PROVINCIA: ..... CANTÓN: ..... PARROQUIA URBANA: .....

PARROQUIA RURAL: .....

1) OFICINA DE REGISTRO CIVIL DE: ..... Oficina No.

3) FECHA DE INSCRIPCIÓN: Año Mes Día

4) Acta de Inscripción Nº: (Debe ser el mismo que consta en el libro de Inscripciones)

(A) DATOS DEL NACIDO VIVO

5) APELLIDOS ..... NOMBRES .....

6) SEXO: Hombre 1, Mujer 2

7) TALLA: cm

8) PESO: gramos

9) GRUPO SANGUÍNEO: Tipo de Sangre: A 1, B 2, AB 3, O 4, 9 Ignorado; Factor Rh: + 1, - 2, 9 Ignorado

10) TIPO DE PARTO: Normal 1, Cesárea 2

11) FECHA DE NACIMIENTO: Año, Mes, Día

12) SEMANAS DE GESTACIÓN: Semanas

13) TIPO DE EMBARAZO (MULTIPARIDAD): Simple 1, Doble 2, Triple 3, Cuádruple ó más 4

Se debe considerar que para cada nacido vivo corresponde llenar un formulario en forma independiente.

14) NACIDO EN: Establecimiento del Ministerio de Salud 1, Establecimiento del IESS 2, Otro Establecimiento del Estado 3, Hospital, Clínica o Consultorio Particular 4, Casa 5, Otro 6

15) ASISTIDO POR: Médico/a 1, Obstetriz 2, Enfermero/a 3, Auxiliar de Enfermería 4, Partera Calificada 5, Comadrona no capacitada 6, Otro 7

16) LUGAR DE NACIMIENTO: Provincia, Cantón, Ciudad, Parroquia rural, Localidad

17) ÁREA (USO INEC): Urbana 1, Rural 2, Periférica 3

(B) DATOS DE LA MADRE

18) NOMBRES Y APELLIDOS: .....

19) EDAD (En años cumplidos a la fecha del parto)

20) NACIONALIDAD: Ecuatoriana 1, Extranjera 2

21) IDENTIFICACIÓN (Cédula Identidad . o Pasaporte) .....

22) CUÁNTOS HIJOS VIVOS TIENE ACTUALMENTE? (Incluido al que inscribe)

23) ¿CUÁNTOS HIJOS QUE NACIERON VIVOS HAN MUERTO? (a la fecha del parto)

24) ¿CUÁNTOS HIJOS NACIERON MUERTOS ?

25) RECIBIÓ ATENCIÓN PROFESIONAL DURANTE ESTE EMBARAZO ? SI 1, NO 2, Se Ignora 9

26) ETNICIDAD DE LA MADRE

De acuerdo con la cultura, costumbres y autoidentificación étnica como se considera la madre del nacido vivo.

Indígena 1, Afro – Ecuatoriana 2, Negra 3, Mulata 4, Montubia 5, Mestiza 6, Blanca 7, Otra 8

27) ESTADO CIVIL y/o CONYUGAL: Unida 1, Casada 3, Separada 5, Se Ignora 9, Soltera 2, Divorciada 4, Viuda 6

ALFABETISMO E INSTRUCCIÓN

28) ¿SABE LEER Y ESCRIBIR? SI 1, NO 2

29) NIVEL DE INSTRUCCIÓN ALCANZADO: Ninguno 0, Centro de Alfabetización 1, Primaria 2, Secundario 3, Educación Básica 4, Educación Media 5, Ciclo Post–Bachillerato 6, Superior 7, Postgrado 8, Se ignora 9

30) RESIDENCIA HABITUAL DE LA MADRE: Provincia, Cantón, Ciudad, Parroquia rural, Localidad

31) ÁREA (USO INEC): Urbana 1, Rural 2, Periférica 3

32) Residente 1, No Residente 2

(C) DATOS DEL PADRE

33) NOMBRES Y APELLIDOS: .....

34) EDAD (En años cumplidos a la fecha del nacimiento)

35) NACIONALIDAD: Ecuatoriano 1, Extranjero 2

(D) INFORMACIÓN GENERAL

36) DATOS DE LA PERSONA QUE ATENDIÓ EL PARTO:

Nombres y Apellidos | Nº Teléfono | Nº Registro Profesional | Firma

37) ESTABLECIMIENTO DE SALUD DONDE OCURRIÓ EL NACIMIENTO:

Nombre del Establecimiento | Ciudad o Parroquia Rural – Provincia | Dirección y Nº Teléfono

NOTA: ESTE DOCUMENTO Y SU TRAMITACIÓN SON GRATUITOS

INSTRUCCIONES PARA LLENAR EL INFORME ESTADÍSTICO DE NACIDO VIVO

El informe Estadístico de Nacido Vivo, constituye el requisito indispensable para la inscripción del Nacido Vivo en las Oficinas de Registro Civil.

DEFINICIÓN DE NACIDO VIVO.- Se entenderá por nacido vivo, a la expulsión o extracción completa del cuerpo de la madre, prescindiendo de la duración del embarazo de un producto de la concepción, que después de tal separación, respire o manifieste cualquier otro signo de vida, tal como el latido del corazón, pulsaciones del cordón umbilical o movimiento efectivo de músculos voluntarios, haya o no haya sido cortado el cordón umbilical y esté o no unida a la placenta; cada producto de tal alumbramiento se considerará nacido vivo.

Todos los niños nacidos vivos deben inscribirse y considerarse como tales, cualquiera que sea el período de gestación y esté vivo o muerto en el momento de ser inscrito; y si mueren en cualquier momento posterior al nacimiento debe inscribirse su nacimiento y su defunción.

¿QUIÉN DEBE LLENAR EL INFORME ESTADÍSTICO?.- Cuando el nacimiento haya ocurrido en un establecimiento de salud y con atención de médico, obstetriz o enfermera, el Informe Estadístico de Nacido Vivo deben llenar dichos profesionales, desde el numeral 6 al 37, a excepción de los espacios sombreados (*USO INEC*). Los numerales 1 al 5 deben llenar los funcionarios de las Oficinas del Registro Civil en donde se inscriben los nacimientos. Si el nacimiento ocurre sin atención "profesional" el Informe Estadístico debe llenar un funcionario de salud, en todos los espacios que corresponde.
En los lugares donde no haya funcionario de salud el Informe Estadístico llenará el Jefe de Registro Civil en todo su contenido, dejando los espacios en blanco que es para USO INEC, y anotando en Observaciones cualquier indicación que permita aclarar algún dato.
Cuando el nacimiento ocurre en un establecimiento de salud y es atendido por Auxiliar de Enfermería, registrará la información en el numeral 36 e igual tratamiento se dará en el caso de que sea asistido por partera calificada, comadrona no capacitada u otro.

Este formulario debe ser llenado a máquina o con letra clara y legible de la siguiente manera:

1) Anote el nombre de la capital de la provincia, cabecera cantonal, parroquia rural, y nombre de la Oficina de Registro Civil donde se inscribe.
2) Escriba el nombre de la provincia, cantón y parroquia urbana o rural donde está ubicada la Oficina en la cual se inscribe el nacimiento. En el caso de las oficinas cantonales el espacio de parroquias puede dejarse en blanco.
3) En las casillas correspondientes, anote el año, mes y día en el que se efectúa la inscripción del nacimiento.
4) Anote el número de Acta de Inscripción (que consta en el libro de Registros), empezando con el número (1) la primera inscripción realizada en el año de información, siguiendo la numeración en orden ascendente, sin repetir ni omitir ningún número, hasta el 31 de diciembre del mismo año. Esta numeración secuencial única comprenderá tanto a las inscripciones normales, como a las tardías, a excepción de Oficinas del Registro Civil que mantienen dos libros diferentes, en esos casos tendrán dos numeraciones secuenciales.

(A) DATOS DEL NACIDO VIVO

5) **Apellidos y Nombres.**- Escriba los apellidos y nombres completos del nacido vivo al que corresponde la inscripción.
6) **Sexo**.- Marque con una "X" la casilla correspondiente al sexo del nacido vivo.
7) **Talla**,.- Anote la Talla en centímetros que fue medido desde el talón a la coronilla del recién nacido. Rango válido (38 a 52 cm.)
8) **Peso** . El peso debe ser medido y registrado máximo a la hora del nacimiento. (Rango válido 1100 a 3800 gramos)
9) **Grupo Sanguíneo.-** Marque con una " X" el tipo de sangre y Factor Rh del recién nacido. Si no se conoce, marque las casillas "9" Ignorado.
10) **Tipo de Parto**.- Marque con una "X" el casillero que corresponde si el tipo de parto fue normal o por cesárea.
11) **Fecha de nacimiento**.- En las casillas correspondientes, anote el año, mes y día en el que ocurrió el nacimiento.
12) **Semanas de Gestación.**- Es el período en semanas que va desde la última menstruación hasta el momento de la salida del producto de la concepción. Es válida la información que va desde 28 a 42 semanas.
13) **Tipo de Embarazo**,.- Marque con una "X" la casilla respectiva. Si marcó las casillas (2), (3) o (4), y todos nacieron vivos, se debe elaborar sendos informes en forma individual. Si uno o más de los niños nacieron muertos, se debe llenar el Informe Estadístico de Defunción Fetal
14) **Nacido en**.- Marque con una "X" la casilla correspondiente al establecimiento o lugar donde se produjo el nacimiento.
En establecimiento del Ministerio de Salud, se marcará cuando el nacimiento haya ocurrido en cualquier casa de salud perteneciente a dicho Ministerio. En establecimiento del IESS (INSTITUTO ECUATORIANO DE SEGURIDAD SOCIAL), se marcará el nacimiento ocurrido en sus hospitales o clínicas. En otro establecimiento del Estado, se marcará el nacimiento ocurrido en hospitales de las Fuerzas Armadas, Municipio, Policía,etc. Hospital, clínica o consultorio particular, se marcará cuando el nacimiento haya ocurrido en cualquier establecimiento del sector privado. Casa, se marcará cuando el nacimiento haya ocurrido en un domicilio particular. Otro, se marcará cuando el nacimiento haya ocurrido en un lugar que no sea ninguno de los anteriormente mencionados.
15) **Asistido por**.- Según el caso marque con una "X" una de las casillas que corresponda a las alternativas de respuesta. Se marcará en Otro (7), cuando el parto haya sido asistido por alguna persona diferente a las categorías que se mencionan.
16) **Lugar de nacimiento**.- Escriba con claridad el nombre de la provincia, cantón, ciudad, parroquia rural o localidad donde ocurrió el nacimiento.
17) **Area**.- No llene estos casilleros, son de uso exclusivo del INEC.

(B) DATOS DE LA MADRE

18) **Nombres y apellidos**.- Escriba los nombres y apellidos de la madre del nacido vivo.
19) **Edad de la madre**.- Anote la edad de la madre en años cumplidos a la fecha del parto.
20) **Nacionalidad:**- Según sea el caso marque la Nacionalidad de la madre.
21) **Identificación**.- Se hará constar el número de cédula o pasaporte de la Madre.
22) **Cuántos hijos vivos tiene actualmente**?.- Anote el número de hijos actualmente vivos, incluyendo al recién nacido que inscribe.
Si es el primer hijo nacido vivo el que se inscribe, Anote 01.
23) **¿Cuántos hijos que nacieron vivos han muerto?**.- Anote en las casillas correspondientes, el número de hijos que han nacido vivos, pero que han fallecido hasta la fecha del parto. Cuando la respuesta sea ninguno anote 00.
24) **¿Cuántos hijos nacieron muertos?**.- Anote el número de hijos que han nacido muertos. Cuando la respuesta sea ninguno, anote 00.
25) **Recibió atención profesional durante este embarazo**.- Indique si la madre del nacido vivo, recibió o no atención profesional durante el embarazo. Si se desconoce, marque la casilla 9 (Ignorado)
26) **Etnicidad de la Madre.-** Marque con una "X" una de las casillas predeterminadas que corresponda a la auto identificación de la madre del recién nacido. Si la persona que informa no se identifica con ninguna de las siete mencionadas, marque Otra (8).
27) **Estado civil y/o conyugal.-** Marque con una "X" el estado civil o conyugal de la madre del recién nacido, si se ignora marque la casilla (9).
AL FABETISMO E INSTRUCCIÓN
28) **¿Sabe leer y escribir?**.- Marque con una "X" la casilla que corresponda a la respuesta.
29) **Nivel de instrucción alcanzado**.- Marque con una "X" una de las casillas del nivel de instrucción alcanzado por la madre del recién nacido, si se ignora marque el (9).
30) **Residencia habitual de la madre**.- Escriba con claridad el nombre de la provincia, cantón, ciudad, parroquia o localidad, donde reside habitualmente la madre del nacido vivo.
31-32) **Área**.- No llene estos casilleros, son de uso exclusivo del INEC.

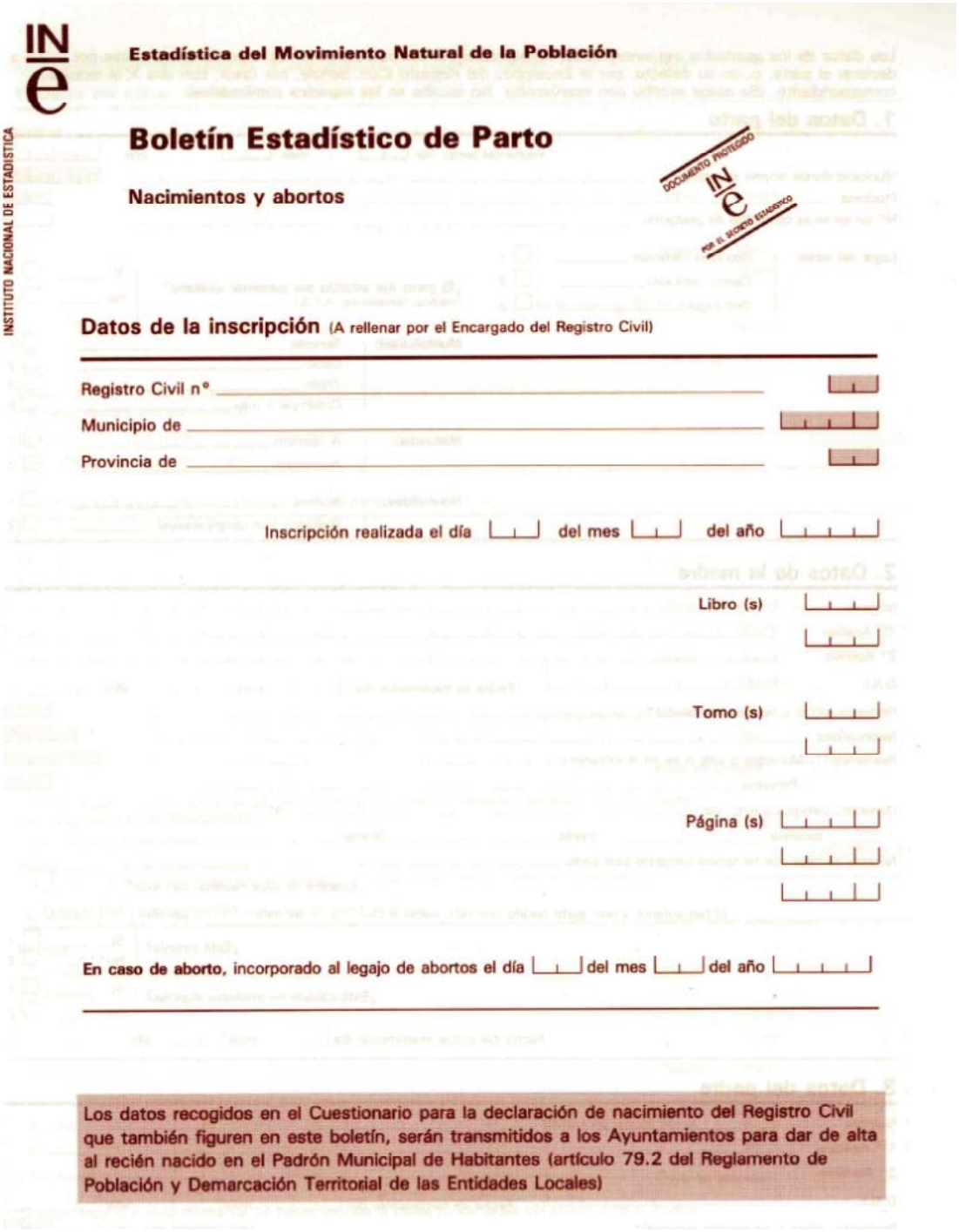
(C) DATOS DEL PADRE

33) **Nombres y apellidos**.- Escriba los nombres y apellidos del Padre del nacido vivo.
34) **Edad del padre**.- Anote la edad del padre del nacido vivo en años cumplidos a la fecha del nacimiento.
35) **Nacionalidad:-** Según sea el caso del padre, marque la Nacionalidad del mismo.

(D) INFORMACIÓN GENERAL

36) **Datos de la persona que atendió el parto**.- Registre los nombres y apellidos, Número de teléfono, Número de Registro Profesional y firma de la persona que atendió el parto.
37) **Establecimiento de Salud donde ocurrió el nacimiento.**- Cuando el nacimiento ocurrió en un establecimiento de salud, escriba con claridad el nombre de dicho establecimiento, la ciudad o parroquia rural, la provincia y la dirección con número telefónico. Deje en blanco en caso de que el nacimiento no ocurrió en un establecimiento de salud.

Figure 2A: Administrative form completed in Ecuador to legalize a birth



INE

INSTITUTO NACIONAL DE ESTADISTICA

Estadística del Movimiento Natural de la Población

Boletín Estadístico de Parto

Nacimientos y abortos

DOCUMENTO PROTEGIDO INE POR EL SECRETO ESTADISTICO

Datos de la inscripción (A rellenar por el Encargado del Registro Civil)

Registro Civil nº _____

Municipio de _____

Provincia de _____

Inscripción realizada el día ___ del mes ___ del año _____

Libro (s) _____

_____

Tomo (s) _____

_____

Página (s) _____

_____

_____

En caso de aborto, incorporado al legajo de abortos el día ___ del mes ___ del año _____

Los datos recogidos en el Cuestionario para la declaración de nacimiento del Registro Civil que también figuren en este boletín, serán transmitidos a los Ayuntamientos para dar de alta al recién nacido en el Padrón Municipal de Habitantes (artículo 79.2 del Reglamento de Población y Demarcación Territorial de las Entidades Locales)

4. Datos del nacimiento o del aborto (Se rellena un apartado por cada nacido vivo o muerto)

1. Datos del primer nacido

Nombre
1er Apellido
2° Apellido

Sexo | Varón ☐ 1 | Mujer ☐ 6

Nació | Vivo ☐ 1 | Muerto ☐ 2

Vivió más de 24 horas | Si ☐ 1 | No ☐ 2

Peso en gramos

Si nació muerto o vivió menos de 24 horas, indique la causa fundamental del aborto o de la muerte
(Se ruega escribir con mayúsculas)

Causa materna o del parto
Causa del feto o del recién nacido

2. Datos del segundo nacido (en caso de parto múltiple)

Nombre
1er Apellido
2° Apellido

Sexo | Varón ☐ 1 | Mujer ☐ 6

Nació | Vivo ☐ 1 | Muerto ☐ 2

Vivió más de 24 horas | Si ☐ 1 | No ☐ 2

Peso en gramos

Si nació muerto o vivió menos de 24 horas, indique la causa fundamental del aborto o de la muerte
(Se ruega escribir con mayúsculas)

Causa materna o del parto
Causa del feto o del recién nacido

3. Datos del tercer nacido (en caso de parto múltiple)

Nombre
1er Apellido
2° Apellido

Sexo | Varón ☐ 1 | Mujer ☐ 6

Nació | Vivo ☐ 1 | Muerto ☐ 2

Vivió más de 24 horas | Si ☐ 1 | No ☐ 2

Peso en gramos

Si nació muerto o vivió menos de 24 horas, indique la causa fundamental del aborto o de la muerte
(Se ruega escribir con mayúsculas)

Causa materna o del parto
Causa del feto o del recién nacido

Sello del Registro Civil | Firma del declarante* | Firma del médico**

Médico colegiado con el n°

* Indíquese debajo de la firma, el parentesco con los nacidos
** Cuando se trate de un nacido muerto o fallecido antes de las 24 horas
NOTA: Si el número de nacidos, en el parto, es superior a tres se cumplimentará un segundo boletín con los datos de inscripción y los datos del cuarto, quinto, etc... nacido.

Naturaleza, características y finalidad

El Movimiento Natural de la Población es el recuento de los nacimientos, matrimonios y defunciones que se producen en el territorio español en un año determinado.

Legislación

Los Encargados del Registro Civil remitirán al Instituto Nacional de Estadística, a través de sus Delegaciones, los boletines de nacimientos, abortos, matrimonios, defunciones u otros hechos inscribibles (art. 20 del Reglamento de la Ley del Registro Civil).

Secreto Estadístico

Serán objeto de protección y quedarán amparados por el **secreto estadístico** los datos personales que obtengan los servicios estadísticos, tanto directamente de los informantes como a través de fuentes administrativas (art. 13.1 de la Ley de la Función Estadística Pública de 9 de mayo de 1989 (LFEP)). Todo el personal estadístico tendrá la obligación de preservar el secreto estadístico (art. 17.1 de la LFEP).

Obligación de facilitar los datos

La Ley 4/1990 establece la **obligación de facilitar los datos** que se soliciten para la elaboración de esta Estadística.

Los servicios estadísticos podrán solicitar datos de todas las personas físicas y jurídicas nacionales y extranjeras, residentes en España (artículo 10.1 de la LFEP).

Todas las personas físicas y jurídicas que suministren datos, tanto si su colaboración es obligatoria como voluntaria, **deben contestar de forma veraz, exacta, completa y dentro del plazo** a las preguntas ordenadas en la debida forma por parte de los servicios estadísticos (art. 10.2 de la LFEP).

El incumplimiento de las obligaciones establecidas en esta Ley, en relación con las estadísticas para fines estatales, **será sancionado** de acuerdo con lo dispuesto en las normas contenidas en el presente Título (art. 48.1 de la LFEP).

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