The Healthy Immigrant Effect: Evidence from the Ecuadorian Exodus

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Abstract

This paper provides new empirical evidence on the factors behind the healthy immigrant effect by analyzing 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. Using administrative data from the Vital Statistics, I can compare the health distribution (in terms of birth weight) of immigrants in Spain to that of non-immigrants in the source country, and not only to that of natives at destination. I find evidence of an important immigrant health advantage, that seems to be partly driven by self-selection on health.

Key words: Immigration, selection, health and birth weight.
JEL codes: J61, I14, C14

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1.- 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 different dimensions (e.g. education, age, risk and entrepreneurial attitudes or health).

The health of immigrants is an issue of concern. Some critical voices have argued that migration may represent a burden to the public health system at destination financed mainly by natives. The health of immigrants may also affect their integration and assimilation process. For the sending country, the characteristics of those who leave may also have implications at the aggregate level in terms, for instance, of 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 positive gap has come to be known 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 socio-economic differences in terms of education and income as most recent immigrants fall behind the native population on these dimensions.

This paper provides new empirical evidence on the factors driving the HIE by analyzing 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 features of this migration episode, I find a health advantage in terms of birth weights in favor of new immigrants. The comparison of birth outcomes between Ecuadorian immigrants and other recent minority groups in Spain, namely Romanians, suggests that the health advantage could partly respond to immigrants' selection on health.

[1] For the US see Jasso et al. 2004, Abraido-Lanza et al. 1999, Antecol and Bedard 2006, and Giuntella 2012. Chen et al. 1996, Perez 2002, Deri 2003, McDonald 2003, and Laroche 2000 document a healthy immigrant effect for immigrants to Canada, while Donovan et al. 1992, Chiswick et al 2008, and Powles 1990 do so for immigrants to Australia.

I employ administrative data on birth outcomes (i.e. Vital Statistics) to compare immigrants in Spain to the native population in Spain and Ecuador. Following the health economic literature, birth weights are strongly correlated with a mother's habits during pregnancy and health, and it also represents an important marker of the infant's health at birth and as an adult (Currier and Moretti 2007, Currier 2007 and Conley and Bennet 2000).

The paper is structured as follows: the next section provides a brief overview of the literature on the health immigrant effect, section 3 highlights the main features of the recent process of Ecuadorian migration, section 4 describes the data, section 5 presents the main results and section 6 concludes.

2.- Previous findings

This section highlights some key findings and the hypothesis these findings generate about the health status of the foreign-born population.

Researchers from a wide array of disciplines have studied health differences between immigrants and native-born individuals, mainly in the US, Canada and Australia. Three main explanations have been proposed to account for the positive health advantage of recent immigrants: health screening by the host country authorities, favorable habits and behaviors of individuals in the home country prior to migration, and immigrant self-selection whereby the healthiest and wealthiest source country residents are most likely to have the financial and physical means to migrate.

Some recent literature suggests that host country health screening policies are not likely to be 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. Uitenbroek and Verhoeff (2002) argue that selection by authorities based on health can not explain the lower mortality of Mediterranean immigrants in Amsterdam.

The second theory 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 that cultural factors explains the immigrant's health advantage is put forward in Abraido-Lanza et al. (1999) who argue that the lower mortality rate of Latinos in the US results from their more favorable health habit behaviors (i.e. less alcohol and cigarette consumptions which are the major risk factors

for cancer and heart diseases, the most common causes of death for both Latinos and non-Latino Whites).

The third theory is based on the notion of immigrant self-selection. There are reasons (and evidence) to suspect that immigrants tend to be different from others in their origin 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 been reported for Mexico (Borjas 1987; Fernández-huertas Moraga 2011).

Given the strong correlation between income and health, we should also observe positive selection on health. 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 terms of 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.[2]

Immigration policies may also determine who migrates. For example, Canada, Australia and New Zealand attempt to attract younger and more educated immigrants via skilled immigrant intake based on points system that explicitly considers age, education level and language fluency. Those individuals are also more likely to arrive in better health. Indeed, in Chiswick (2008) there is evidence that health status varies by visa type.

A major drawback in previous studies is that most of the conclusions regarding the nature of the health gap are based on comparisons between immigrants (generally legal) and native born in the host country. Such a comparison does not allow disentangling the contribution of selection from that of healthy habits or any direct effect of migration on health outcomes. Despite severe data limitation problems, there are a couple of recent exceptions that shed light on the contribution of selective migration by examining the health of immigrants and non-immigrants in the sending

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

country prior to migration. The study by Rubalcava et al. (2008) employs longitudinal data from the Mexican Family Life Survey to compare emigrants from Mexico to similar non-emigrants. The findings indicate some evidence of positive selection in terms of physical health measures. In contrast, Stillman et al (2009) using data from Tongan potential immigrants and non-immigrants find that individuals with poor mental health are more likely to apply to migrate.

Data to compare potential immigrants and non-immigrants previous to migration 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 immigrants 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 immigrants and non-immigrants cannot be compared before the movement occurs. This represents a limitation to the study since the contribution of selection can not be disentangled from any direct effect of migration on health outcomes. However, the international migration episode between Ecuador and Spain has some interesting features that make it an interesting case study to gain further understanding on the nature of the healthy immigrant effect.

First, the Vital Statistics in Spain since 2001 contain information on immigrants irrespectively of the legal status (illegal immigrants are also represented). Second, 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 conclusions. Third, immigration to Spain is a recent phenomenon, and most of the foreign-born in the early 2000s are likely to be recent immigrants. Hence, the effect of acculturation or assimilation on the health gap estimated in the early 2000 (if any) is likely to be small. Fourth, in the early 2000s immigrants from different origins arrived to Spain attacked by the growing economy and the many job opportunities, in particular in the construction sector. The similarity of some of these immigrant groups allows me testing the hypothesis that selection is inversely proportion on distance and thus shed some light on its contribution to the healthy immigrant effect.

3.- Some features of 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 to Spain explains the huge exodus towards the lower income country.

The migration policy in Spain was particularly attractive. Since 1963 a visa waiver program existed for Ecuadorians visiting Spain for a period of up to 3 months. Those who wished to immigrate 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.[3] The lax Spanish immigration policy substantially influence the location choices of Ecuadorian immigrants. According to the calculations in Bertoli et al (2011) the Ecuadorian population in Spain increased from 76,000 individuals before the crisis to 457,000 in 2005, and represented 12 percent of immigration flows to Spain between 1999 and 2005.[4]

Table 1 display the stock of immigrants in Spain during the 2000s recorded in the Local Population Registry. Since 2001, this data source provides an accurate measure of the number of immigrants, both legal and illegal. The reason is that by 2000 a new migration law as approved (Ley Organica 4/2000) that increased the incentives for illegal migrants to register, by allowing them to document their residence in Spain in the occurrence of a future amnesty and by granting access to the public health and education system.[5]

The visa waiver program between Ecuador and Spain 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 the main destination for Ecuadorians in 2004

[3] There were three amnesties to illegal immigrants in Spain (2000, 2001 and 2005).
[4] The same authors estimate that the Ecuadorian population in the US increased from 272,000 individuals before the crisis to 394,000 in 2005, and represented 1.3 percent of immigration flows in the US during this period.
[5] The Spanish data protection policy, prevent the police to access the Local Population Registry to identify illegal aliens.

and 2005 (Bertoli et al 2011). Table 1 also shows the stabilization of 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 birth outcomes of immigrants in the early 2000s in Spain should be weakly affected by sorting across countries.[6]

4.- Data

This study employs birth outcomes, in particular weights, as a measure of an individual's health. Several studies have demonstrated that weight at birth is sensitive to many environmental factors, including maternal behaviors like smoking and drinking and nutritional practices (e.g. Currier et al 2009; Hoynes et al. 2011). Economists have also been active in showing that health at birth is predictive of future outcomes such as health, education and other labor market outcomes (e.g. Behrman and Rozenzweig 2004; Black et al. 2007).

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 in some previous studies. The self-reported assessment of one's own health 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 diabetes, heart diseases, asthma or diseases of the lung are also subject to criticism. The reason is that the lower incidence of chronical diseases reported for the foreign-born may simply result from their less frequent contact with western medial diagnostics.

In this study I employ birth outcomes recorded in the Vital Statistics of Ecuador and Spain. The information in the Vital Statistics corresponds to all births in the Local Population Registry. In both countries, birth registration is the administrative procedure to legalize a vital event.[7] As discussed, immigrants in Spain since 2001, independently

[6] 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).

[7] In order to register a birth, the parents or the legal representative of the child has 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).

of their legal status, have strong incentives to appear in the Local Population Register to have access to the public and health education system and to prove residence in Spain for future amnesties. Hence, the Vital Statistics give coverage to all legalized births occurred in both countries.

There are some differences regarding the information in the Vital Statistics. When comparing both countries, I restrict the analysis to variables that are common in both surveys (e.g. date of birth, gender, place of birth, weight, and mother's age and nationality). Information of interest such as gestational weeks appear in the Ecuadorian data only after 2004, and maternal education is collected in Spain only after 2006.

We restrict our analysis to the early years of 2000s, and in particular to 2001. There are several reasons for this choice. First, the Vital Statistics do not contain information on years since arrival and it is therefore not possible to take into account the effect of acculturation or 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. Hence, the majority of Ecuadorian in the early 2000s are likely to be 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 only contain the nationality of the mother and not the country of birth. In the early 2000s there were 3 amnesties to legalize immigrants (2001, 2002 and 2005). Hence by the mid-2000s many Ecuadorians may have obtained the Spanish citizenship and thus could not be identified as immigrants in the Vital Statistics.[8]

Table 2 shows the percentage of births occurred in Spain by some of the most popular foreign nationalities. The effect of the immigration inflow is clear from the table.[9] The number of total births increased from 406,380 in 2001 to 519,779 in 2008 (the beginning of the Spanish economic recession) and the share to foreign mothers from shifted from 8,24 to 20,81 percent in this period. The incidence of the Ecuadorian Exodus also shows up 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. This percentage is similar to that of Moroccans (2,41 in 2003), a minority group with a large tradition in the country. Between 2001 and 2003, 10,5 percent of the births in Spain were to foreign mothers, and among those births to

[8] After two years of legal residence in Spain, Ecuadorians become elegible for naturalization.
[9] The share of immigrants in Spain shifted from less than 3% in 1999 to about 16% in 2011.

Ecuadorian and Moroccan mothers represented a 20 percent each. The table also shows the increase in the birth rate to Romanians, 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 from the analysis. 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 nationality, the heaviest babies are born to Moroccans (3,360 grams in 2001), followed by Ecuadorians (3,273 grams in 2001) and Romanians (3,219 grams in 2001). The previous ranking on the size of babies contrasts with the statistics reported by the World Bank on the incidence of low birth (i.e. live births under 2,500) in the origin countries. Accordingly, Romania is the country with the lowest rate (9 percent in 2000), followed by Morocco (15,4 percent in 2004) and Ecuador (16 percent in 2000). The low birth rate in Spain was 6,5 percent in 2000 and increased to 7.7 in 2010.[10]

The second data source employed in the analysis is the Vital Statistics for Ecuador, from the Instituto Nacional de Estadística y Censos. The data covers all registered births occurred in the country. To register a birth, the parents or legal representative of the newborn has to present an administrative form ("Informe Estadístico del Nacido Vivo") that contains information on the birth outcome. When the birth occurs at a hospital the form is completed by a health professional, otherwise it is completed by an administrative officer at the registry. A key piece of information for the current study is the birth weight, which has to be measured at most one hour after occurrence. It is then very likely that when the birth does not occur in a hospital or is not assisted by a health professional the information is missing. In the early 2000s the rate of underreported birth weight is around 40%. However, this rate is unevenly distributed across different groups. According to Table 4, underreporting in 2001 is less than 30% among mothers with more than primary education and births occurred in hospitals. The rate of underreporting in urban areas is also much lower than in rural areas (38 percent and 73 percent respectively). By 2002, the underreporting rate had

[10] World Bank Health Nutrition and Population Statistics.

decreased to 32% in urban areas, to 20% in hospitals and to 24% among mothers with more than primary education.

Due to the incidence of underreporting, the information on birth weights collected in the Vital Statistics is not likely to be representative of the whole Ecuadorian population but more educated and middle/high-income groups living in urban areas are likely to be overrepresented. While this is an obvious 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 of the country. Those areas 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 in Spain than the population as a whole. This will limit the magnitude of the bias due to different composition of the comparison group.

Table 5 compares the mean birth weights of non-immigrants in Ecuador to that of immigrants in Spain between 2000 and 2005. 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. In the next section, I formally investigate those differences in birth outcomes.

5.- Results

I first examine whether the gap in birth weight between newborns to natives and Ecuadorian mothers living in Spain is statistically significant. In doing so I estimate the following model:

$$BW_i=\beta_0+\beta_1 Immigrant_i+\beta_2 gender_i+\delta_{mother\ age}+\gamma_{month}+\lambda_{province}+u_i \quad (1)$$

where the dependent variable BW_i (the birth weight of child i) is regressed on an indicator for being born to an Ecuadorian mother ($Immigrant_i$), an indicator for the gender of the child ($gender_i$), a set of dummies for the age of the mother when the birth occurs (δ), an indicator for the month of birth (γ), and a set of dummies for the province

of residence ins Spain.[11] The estimates of the model in equation (1) are presented in Table 6. I have estimated the regressions separately for the years from 2000 to 2005. In interpreting the results one should bear in mind that immigrants in Spain had incentives to appear in the Local Population Registry (and thus the Vital Statistics) only after 2000, and that most Ecuadorians landed in Spain between 1999 and 2002. Hence the most accurate estimates for the healthy immigrant effect are those obtained from comparisons in 2001-2002.[12]

The estimated difference in birth weight is 89.08 grams in 2001 and 84.13 in 2002, and it is statistically significant at any conventional level. Since the majority of Ecuadorians in the early 2000s were recent immigrants, these estimates of the healthy immigrant effect are not likely to be affected by the process of assimilation or acculturation.

By 2005, the estimated difference in birth weight had increased to 115.83 grams. The interpretation of the evolution of the health gap requires caution. First, the Vital Statistics do not contain information on the years since arrival and thus after 2001-2002, after the massive arrival of Ecuadorians to Spain, it is not possible to disentangle the contribution of assimilation from that of the initial health advantage. Moreover, by 2005 a non negligible fraction of Ecuadorians had been naturalized and could not longer be identified in the data as immigrants. Accordingly, the presence of selection could also affect the behavior of the health gap.

There is evidence of a faster acculturation process 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. According to the estimates in Table 7, neither the nationality of the father nor the intermarriage indicator are statistically significant. The results are likely to be driven by the high degree of sorting in the data. In 2001, a 0.31 percent of the births in the sample were to interethnic couples and this percentage increased to only 0.71 percent in 2005. Among Ecuadorian mothers, the share of interethnic couples is percent and increases to by 2005. If I reestimate the model in Table 7 only on the sample of

[11] Spain is divided into 52 administrative provinces. Previous work has documented that immigrants by natioanlity are highly segregated across provincies (see, for example, Farré et al. 2011).
[12] It is also important to take into account that the underreporting rate in Ecuador substantially decreased between 2001 and 2002.

Ecuadorian mothers, I also do not find any evidence of intermarriage on birth outcomes.[13]

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 of the distribution, in particular the upper tail.

Table 8 examines the presence of the health 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 of preterm birth (column 3), one for death in the first 24 hours after birth (column 4), and a gender indicator (column 5).[14] The estimates indicate a health advantage in favor of immigrants for the incidence of low birth weight (i.e. 1.6 percentage points lower), but not in terms of the other outcomes.

From the previous results we can conclude that, upon arrival to Spain, newborns to Ecuadorian mothers are heavier than those born to native women. As the economic literature has suggested, this may have implications on future economic outcomes, and maybe compensate part of the negative effect associated 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.

I next compare the weight of births to Ecuadorian immigrants in Spain to that of non-immigrants in Ecuador. Table 9 indicates that newborns to immigrants are between 168-148 grams heavier than those to non-immigrants. Health indicators are in general better in Spain than in Ecuador (see Table 1A in the appendix), and this may partly reflect better health care systems or some other environmental factors (i.e. less polution[15]). Table 10 removes from the previous estimate the effect of being born in Spain (common to natives and immigrants). The net birth weight difference is reduced to 60-65 grams, and remains highly significant at any conventional level.

[13] See Table 5A.
[14] There is evidence that poor maternal nutrition around the time of conception skews the sex ration in favor of girls (Mathews et al. 2008; Cameron 2004; Song 2013)
[15] Currie and Walker (2011) show that trafic congestion (and thus polution) contributes significantly to poor health among infants.

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.[16] This result is also evident from the plot of the difference between the native and immigrant distribution (see figure 2b).

An important limitation in this study is that the available data do not allow us to conclude whether the health advantage of immigrants responds only to migrants selected on health or to the fact that migration may have a direct effect on birth outcomes. 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 reported in the paper by Stillman et al. (2012) where using the Tongan migrant lottery investigate 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 those findings.

While those change 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. It has been recently documented that restricted maternal nutrition and stress associated to economic difficulties during critical windows of fetal development can negatively affect birth outcomes.[17]

To gain a better understanding of the factors behind the health gap I further exploit the evidence from the large inflow of immigrants to Spain in the 2000s. The share of foreign born population shifted from less than 4% in 2000 to 10% in 2005 and 14% in 2010 (see Table 1). Immigrants originated from a variety of countries in North

[16] Table 4A replicates the results in Table 6 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 midde/upper part of the distribution.

[17] Almond and Mazumder (2011) have shown that prenatal exposure to Ramadan among Arab mothers results in lower birth weight and reduced gestation length. Bozzoli and Quintana (2013) that nutritional deprivation and maternal stress affected the birth outcomes of low-educated mothers during the Argentinean crisis.

Africa, South America and Eastern Europe. The three top sending countries in the 2000s were Morocco, Ecuador and Romania.

The costs of migration should increase with the geographic distance between the source and the host country. Accordingly, the simplest model of migration would predict that, given skill prices, countries located at a great distance from Spain should be sending more skilled and healthier immigrants. I can test this prediction and shed some more light on the role of selection in explaining the health gap in favor of Ecuadorian immigrants.

I will mainly focus the comparison on immigrants from Ecuador and Romania. The difference in the geographic distance between Spain and these two countries is enormous, however immigrants from those destinations are comparable in many other dimensions. First, there are low cultural and linguistic barriers for both groups (i.e. Spanish is the language of Ecuador, and Romanian is a Romance language very close to Spanish[18]). Second, while Moroccans were a well established minority group in Spain before 2000, the bulk of Ecuadorians and Romanians arrived between 2000 and 2002.[19] Third, the two groups moved to Spain for economic reasons. Ecuadorians moved escaping from the economic and financial collapse in 1999. Migration from Romania arrived to Spain looking for jobs, as a result of the high unemployment rates after the massive restructurings of state enterprises in the late 1990s (Stan 2009). Finally, the Spanish migration law was also relatively lax between Romania and Spain. After January 2002 a visa waiver program enabled Romanians to enter as a tourist and stay for 3 months. Many overstayed the legal period and became illegal aliens while waiting for an amnesty.

Table 2A compares the socio-economic outcomes of the most popular minority groups in Spain. There are clear differences between Moroccans and the other two minority group, particularly for females. Moroccan females are older, disproportionately low-educated, have more kids and work much less. Romanian and Ecuadorian females are closer in terms of those characteristics, though females in the former group are, on average, half a year younger, more educated (a 66% of Romanians have a high school diploma or higher education, as opposed to 46% of Ecuadorians) and have lower fertility rates (a 49 percent of the Rumanians have children, as opposed to 76 percent of

[18] The lexical similarity of Romanian with Spanish has been estimated at 71%.
[19] Table A3 in the appendix indicates that among Moroccan immigrants living in Spain between 2000 and 2004 a 70% of them had arrived before 2001. In contrast, a 70% of Ecuadorian migrants arrived between 2000 and 2004. This percentage is 60% among Romanians.

the Ecuadorians and the average number of kids is 1.79 for Romanians and for Ecuadorians). These observed differences in family composition may respond to the fact that many Romanian women, due to the geographical proximity between the two countries, moved mainly to work living their family behind and with a clear intention to return after a few years.

Table 11 compares the birth outcomes of the three groups. The excluded category in all regressions are immigrants from Ecuador. Most of the health outcomes indicate a clear advantage of Ecuadorians with respect to Romanians: newborns to Ecuadorian mothers are 46 grams heavier, the probability of low-birth is almost 3 percentage points lower, the incidence of preterm births and the probability of death during the first 24 hours is also lower, although very small. All the effects are highly statistically significant. This health advantage is not present when comparing most of the aggregate health indicators in Table 1A. In particular, the incidence of infant mortality and low birth weight is much higher in Ecuador than in Romania. Hence the findings in table 11 are consistent with the idea that selection is inversely proportional to geographical distance.

The results for Moroccans indicate a health advantage with respect to Ecuadorians in terms of birth weight of 56 grams. There is also evidence that the incidence of low birth weight is smaller among Moroccans, although the magnitude is less than 1 percentage point. The probability of preterm birth is also negative, though this difference is only significant at 10%. The advantage in terms of birth weight in favor of immigrants from Morocco (a country that is only 14 km from the Spanish border) should not be interpret as evidence against selection based on distance, as this group has been in Spain for many years and its socioeconomic composition is different from that of other groups.

The previous results reveal a clear health advantage for new immigrants in terms of birth outcomes. Upon arrival to Spain, newborns to Ecuadorian mothers are 90-85 grams heavier than those born no native women in Spain, and 60-63 grams heavier than those who stayed in Ecuador. While I cannot precisely estimate the contribution of selection to the health gap, the comparison between newly arrived immigrants to Spain from different ethnic origins suggests that Ecuadorian immigrants were positively selected in terms of birth outcomes.

5 Conclusions

(To be completed)

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Tables

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

Year	Total Population	Foreign born	Born in Ecuador	Born in Morocco	Born in Romania
2000	40,499,790	1,472,458	21,736*	236,517	7,543
2001	41,116,842	1,969,270	140,631	299,907	33,044
2002	41,837,894	2,594,052	259,779	370,720	68,561
2003	42,717,064	3,302,440	387,565	438,221	137,834
2004	43,197,684	3,693,806	470,090	474,523	206,395
2005	44,108,530	4,391,484	487,239	557,219	312,099
2006	44,708,964	4,837,622	456,641	605,961	397,270
2007	45,200,737	5,849,993	434,673	621,295	510,983
2008	46,157,822	6,044,528	458,437	683,102	706,164
2009	46,745,807	6,466,278	479,117	737,818	762,163
2010	47,021,031	6,604,181	484,623	760,238	784,834
2011	47,190,493	6,677,839	480,626	769,106	810,348
2012	47,265,321	6,759,780	471,640	779,481	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

		Share to mothers of differnt nationalities			
	Total number of births	Foreign	Ecuadorian	Moroccan	Romanian
2000	397,632	6.2	0,65	1,57	0,14
2001	406,380	8.24	1,39	1,81	0,25
2002	418,846	10.55	2,01	2,11	0,50
2003	441,881	12.23	2,38	2,41	1,11
2004	454,591	13.78	2,44	2,86	1,27
2005	466,371	15.07	2,13	3,13	1,48
2006	482,957	16.54	1,88	3,59	1,82
2007	492,527	18.98	1,89	4,09	2,35
2008	519,779	20.81	1,84	4,89	2,62
2009	494,997	20.72	1,65	5,26	2,41
2010	486,575	20.55	1,39	5,58	2,55
2011	471,999	19.51	1,13	5,24	2,46

Source: Vital Statistics. Spanish Statistical Office.

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: 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 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: Evidence of the Healthy Immigrant Effect

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
Immigrant from Ecuador	54.636*** [9.957]	89.082*** [6.853]	84.973*** [5.714]	91.214*** [5.101]	111.631*** [4.966]	116.015*** [5.230]
sex	118.801*** [1.632]	118.787*** [1.624]	115.994*** [1.624]	116.476*** [1.586]	116.777*** [1.583]	116.357*** [1.581]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
province dummies	YES	YES	YES	YES	YES	YES
Constant	3,029.093*** [27.846]	3,029.677*** [28.024]	3,009.225*** [28.769]	3,075.785*** [27.688]	3,064.146*** [29.321]	2,987.179*** [28.528]
R2	0.023	0.023	0.021	0.021	0.022	0.021
Nobs	345,168	348,050	352,719	367,320	372,482	374,515

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

Table 7: Evidence of the Healthy Immigrant Effect

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
Immigrant from Ecuador (mother)	44.509** [21.745]	101.260*** [16.175]	78.720*** [13.689]	118.082*** [12.019]	114.170*** [11.279]	109.897*** [11.134]
Immigrant from Ecuador (father)	-10.79 [46.275]	27.722 [35.881]	-13.199 [28.212]	-2.331 [22.171]	-26.686 [19.474]	27.697 [17.872]
Immigrant from Ecuador (both)	28.594 [52.342]	-37.37 [40.040]	27.398 [31.934]	-25.031 [25.770]	25.227 [23.094]	-18.032 [21.802]
sex	119.055*** [1.640]	119.077*** [1.633]	116.162*** [1.633]	116.442*** [1.594]	117.232*** [1.591]	116.400*** [1.588]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
province dummies	YES	YES	YES	YES	YES	YES
Constant	3,041.169*** [29.863]	3,039.134*** [30.138]	3,011.860*** [31.127]	3,073.565*** [29.860]	3,073.711*** [31.271]	2,999.008*** [30.982]
R2	0.023	0.023	0.021	0.021	0.022	0.021
Nobs	340,984	343,624	347,948	362,651	367,719	369,885

Source: Vital Statistics. Spanish Statistical Office
Note: OLS estimates of the linear model in equation (1) . The equivalent Table 6 estimated only on the sample for which the nationality of the father is available is reported in Table 6A

Table 8: Evidence of the Healthy Immigrant Effect (Additional birth outcomes, 2001/02)

	Low birth Weight	Gestational age	Pre-term birth	Death before 24 hours	Male
Immigrant from Ecuador	-0.016*** [0.003]	0 [0.025]	0.001 [0.000]	0 [0.000]	-0.004 [0.007]
sex	-0.011*** [0.001]	-0.050*** [0.006]	0 [0.000]	0.000** [0.000]	
age dummies	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES
province dummies	YES	YES	YES	YES	YES
Constant	0.096*** [0.013]	38.772*** [0.106]	0.002 [0.002]	-0.001 [0.002]	0.519*** [0.029]
R2	0.003	0.008	0	0	0
Nobs	348,050	314,444	314,444	348,050	348,050

Source: Vital Statistics. Spanish Statistical Office

Table 9: Difference in birth weight of immigrants in Spain and non-immigrants in Ecuador

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
Immigrant from Ecuador	123.498*** [11.148]	168.033*** [7.319]	148.361*** [5.984]	158.466*** [4.948]	246.640*** [4.187]	235.347*** [4.585]
sex	75.509*** [2.753]	75.108*** [2.643]	74.230*** [2.477]	74.435*** [2.345]	65.934*** [2.063]	71.618*** [2.075]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
Constant	2,981.054*** [14.815]	3,001.450*** [14.206]	2,986.936*** [12.662]	3,010.979*** [11.837]	2,950.960*** [10.553]	2,964.072*** [10.620]
R-squared	0.009	0.014	0.016	0.02	0.034	0.03
Observations	153,957	153,088	170,637	161,451	157,037	167,270

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

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
Being born in Spain	106.918***	108.381***	84.678***	83.277***	152.280***	133.909***
	[1.718]	[1.713]	[1.680]	[1.668]	[1.635]	[1.615]
Immigrant from Ecuador	17.260*	59.980***	64.226***	73.758***	93.027***	100.093***
	[10.279]	[6.920]	[5.724]	[4.966]	[4.664]	[4.965]
sex	105.524***	105.367***	102.466***	103.949***	101.450***	102.537***
	[1.418]	[1.398]	[1.373]	[1.327]	[1.283]	[1.278]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
Constant	2,963.873***	2,976.830***	2,968.848***	2,993.354***	2,931.520***	2,942.007***
	[11.974]	[11.851]	[10.927]	[10.706]	[10.648]	[10.409]
R-squared	0.028	0.03	0.026	0.027	0.044	0.04
Observations	496,734	495,951	515,666	519,074	519,246	532,648

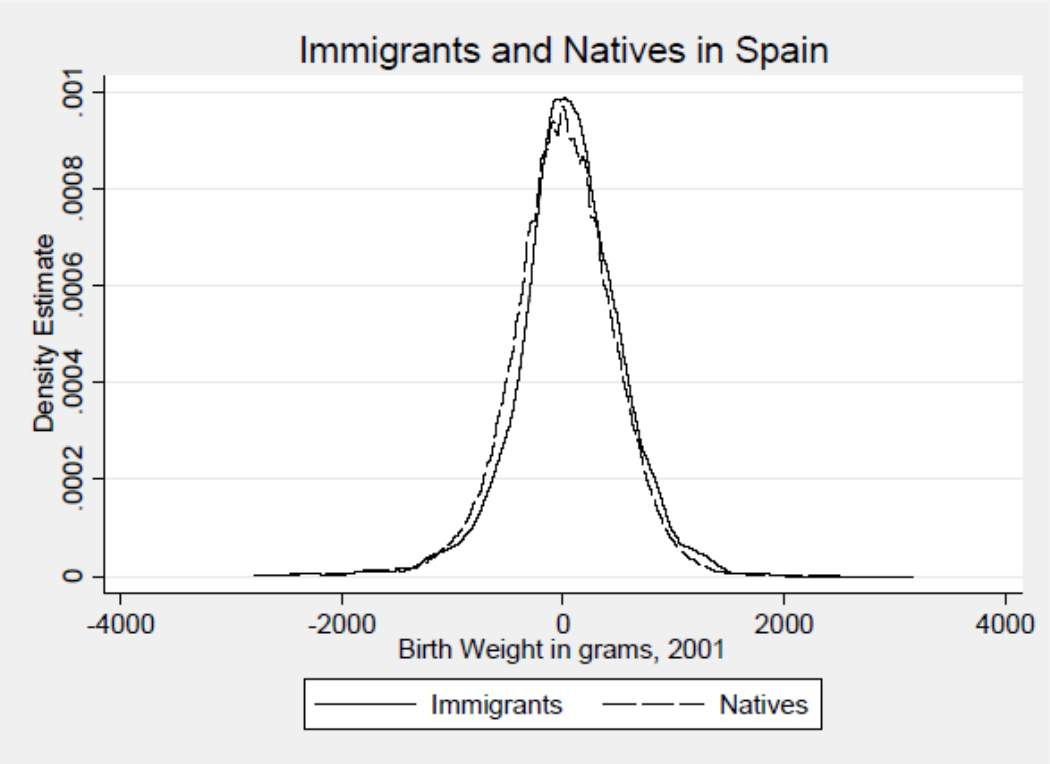
Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes non-immigrants in Ecuador, Ecuadorian immigrants in Spain, and natives in Spain

Table 11: Comparing immigrants born in Spain (2001-2002)

	Birth Weight	Low birth Weight	Gestational age	Preterm birth	Death before 24 hours	Male
ROM_img	-41.679***	0.024***	-0.051	0.003***	0.002**	0.001
	[11.200]	[0.005]	[0.042]	[0.001]	[0.001]	[0.011]
MOR_img	59.941***	-0.008***	0.336***	-0.001*	0.001	0.001
	[7.150]	[0.003]	[0.027]	[0.001]	[0.000]	[0.007]
Male	107.232***	-0.006**	-0.034	0	0.001	
	[5.989]	[0.003]	[0.023]	[0.001]	[0.000]	
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
year dummies	YES	YES	YES	YES	YES	YES
province of residece of the mother	YES	YES	YES	YES	YES	YES
year of birth	YES	YES	YES	YES	YES	YES
Constant	3,037.435***	0.086**	38.384***	0.013*	-0.002	0.446***
	[82.443]	[0.035]	[0.307]	[0.008]	[0.006]	[0.081]
Observations	28,781	28,781	25,464	25,464	28,781	28,781
R-squared	0.031	0.006	0.03	0.005	0.003	0.004

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)

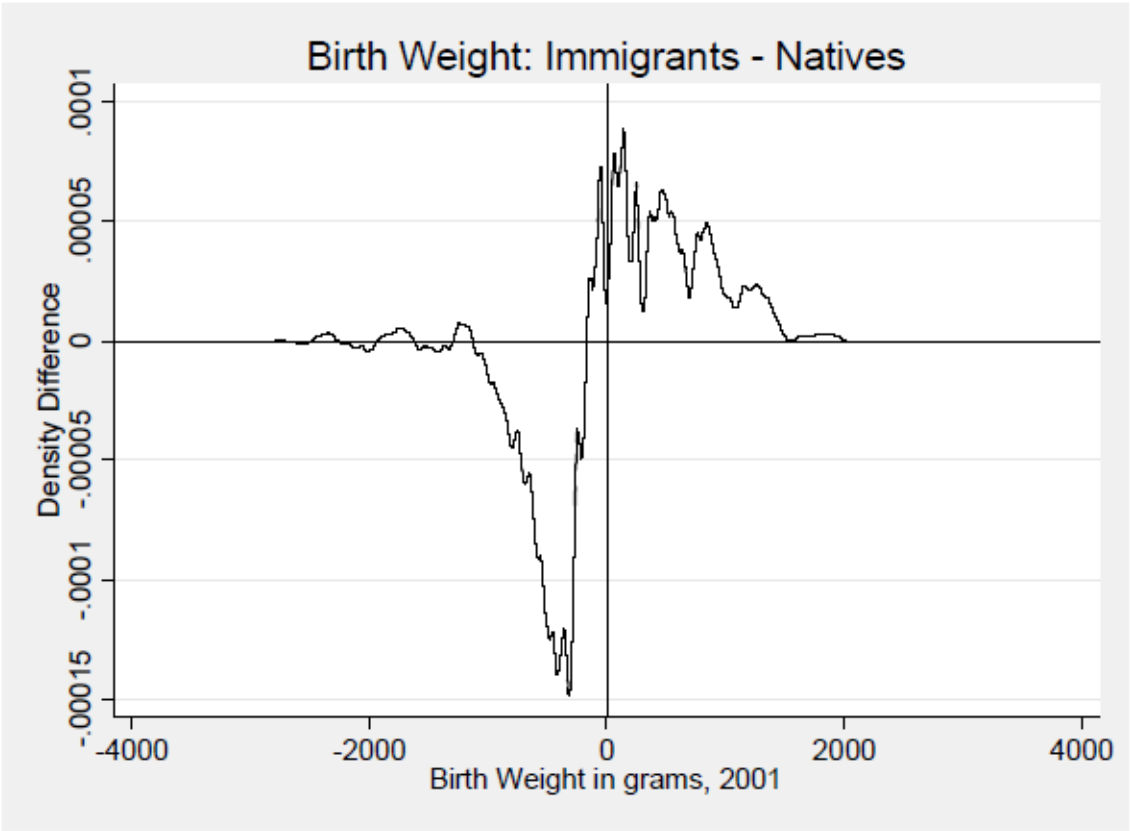
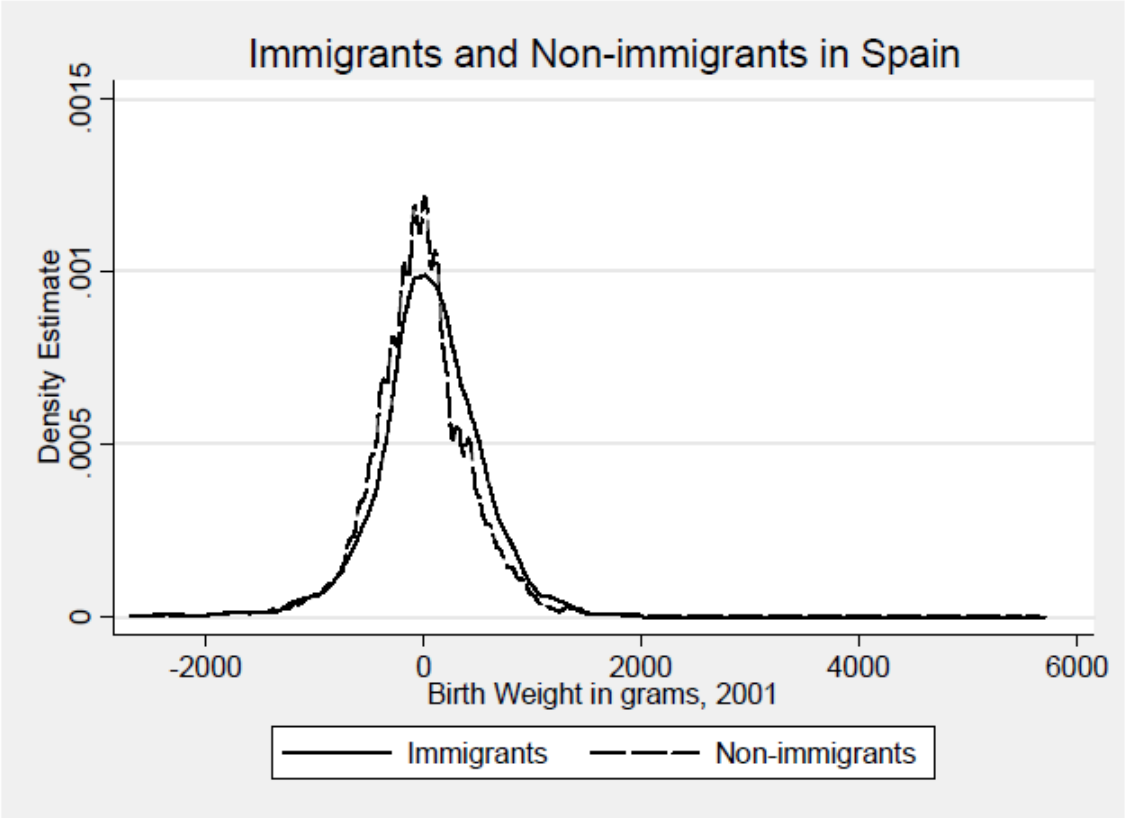


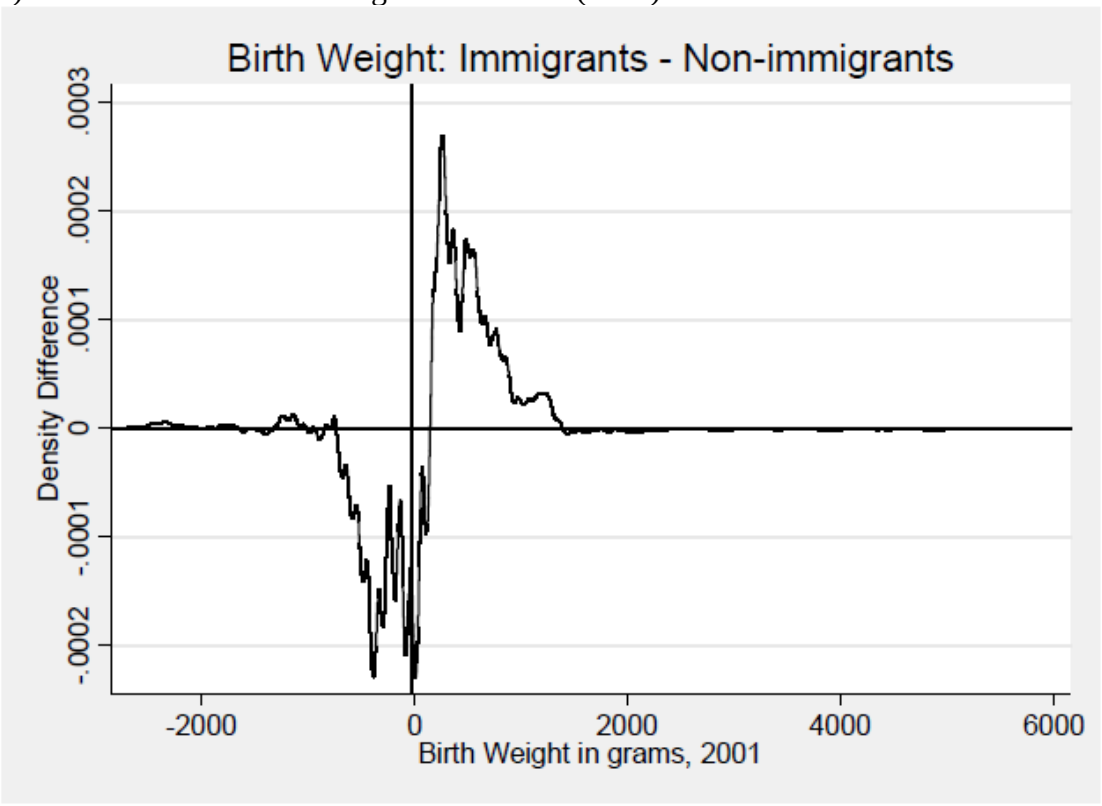
Figure 2:

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 1A:

	Spain	**Ecuador**	**Morocco**	**Romania**
Body mass Index (2000)				
Male	26,6	25	24	24,7
Female	26	26,4	25,5	24,9
Life Expectancy (2000)	83	76	71	75
Infant Mortality Rate, prob of dyng between birth and age; per 1000 live births (2000)	6	28	44	23
Child Mortality Rate, prob of dying before age 5; per 1000 live births (2000)	6	31.4	49	23.8
Low-birth weight	6 (2000)	16 (2000)	15.4 (2004)	9 (2000)
Maternal mortality ratio; per 100,000 live births (2000)	6	110	100	27

Source: World Health Statistics. Several years

Table 2A: Socio-economic characteristics of natives and immigrants in Spain (2000-2004)

	Natives (all)	Immigrants (all)	Ecuador (all)	Morocco (all)	Romania (all)	Ecuador (females)	Morocco (females)	Romania (females)
Age	38.91	35.96	31.52	37.72	31.33	31.54	37.87	30.98
Male	0.5	0.47	0.47	0.54	0.52			
Years since migration		5.56	2.29	6.73	2.17	2.29	6.51	2.02
Year of arrival		1997	2000	1996	2001	2000	1996	2001
Education:								
Primary	0.3	0.24	0.31	0.44	0.18	0.29	0.59	0.17
HS dropout	0.29	0.23	0.26	0.21	0.16	0.25	0.19	0.17
HS graduate	0.26	0.34	0.34	0.16	0.54	0.37	0.15	0.52
College	0.15	0.19	0.09	0.09	0.12	0.09	0.07	0.14
Work	0.57	0.63	0.76	0.53	0.73	0.7	0.27	0.64
High Occupation	0.12	0.11	0.01	0.09	0.01	0.01	0.07	0.01
Middle Occupation	0.18	0.13	0.01	0.07	0.02	0.01	0.14	0.03
Low Occupation	0.69	0.76	0.97	0.83	0.97	0.98	0.79	0.96
% with kids	0.36	0.53	0.74	0.61	0.49	0.76	0.62	0.49
Number of kids	1.47	1.66	1.76	1.97	1.45	1.79	1.99	1.42
Number of observations	2,216,983	85,476	7,066	12,725	3,777	3,712	5,905	1,800

Source: EPA 2000-2004.

Table 3A: Years since arrival by country of origin

	Immigrants	Ecuador	Morocco	Romania
before 2000	49.58	21.6	69.22	18.63
year 2000	14.67	26.32	10.34	18.09
year 2001	14.83	24.63	9.59	20.58
year 2002	11.6	18.11	5.54	20.37
year 2003	6.16	7.49	2.89	15.1
year 2004	3.16	1.85	2.42	7.22
Nobs	45,360	6,152	7,160	3,338

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

Table 4A: Difference in low birth weight probability of immigrants in Spain and non-immigrants in Ecuador

	Low birth weight 2000	Low birth weight 2001	Low birth weight 2002	Low birth weight 2003	Low birth weight 2004	Low birth weight 2005
Being born in Spain	-0.006***	-0.003***	-0.003***	0	-0.009***	-0.007***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Immigrant from Ecuador	0.007	-0.011***	-0.008***	-0.007***	-0.011***	-0.015***
	[0.005]	[0.003]	[0.003]	[0.002]	[0.002]	[0.003]
sex	-0.011***	-0.011***	-0.011***	-0.010***	-0.011***	-0.012***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
Constant	0.091***	0.098***	0.099***	0.082***	0.091***	0.096***
	[0.005]	[0.006]	[0.005]	[0.005]	[0.005]	[0.005]
R-squared	0.002	0.002	0.002	0.001	0.002	0.002
Observations	496,990	496,221	515,946	519,360	519,498	532,902

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 5A: The incidence of interethnic marriage

	Birth weight 2000	Birth weight 2001	Birth weight 2002	Birth weight 2003	Birth weight 2004	Birth weight 2005
Immigrant from Ecuador (father)	17.209 [28.035]	-6.893 [18.566]	12.098 [15.837]	-26.262* [14.302]	-3.497 [13.204]	12.031 [13.474]
sex	97.877*** [22.162]	116.069*** [13.991]	88.510*** [11.718]	89.294*** [10.700]	110.603*** [10.130]	106.392*** [10.926]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
province dummies	YES	YES	YES	YES	YES	YES
Constant	3,848.953*** [574.228]	2,976.432*** [261.485]	3,091.848*** [178.525]	3,114.376*** [143.926]	3,114.970*** [145.579]	3,216.387*** [156.628]
R-squared	0.05	0.036	0.03	0.026	0.035	0.027
Observations	2,266	4,890	7,176	9,201	9,888	8,802

Source: Vital Statistics. Spanish Statistical Office and Ecuador Statistical and Census Office
Note: The sample includes births to Ecuadorian mothers in Spain.

Table 6A: Evidence of the Healthy Immigrant Effect

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
Immigrant from Ecuador	58.483*** [10.215]	93.311*** [7.044]	90.456*** [5.901]	95.583*** [5.224]	113.130*** [5.054]	117.289*** [5.317]
sex	119.053*** [1.640]	119.083*** [1.633]	116.161*** [1.633]	116.440*** [1.594]	117.230*** [1.591]	116.400*** [1.588]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
province dummies	YES	YES	YES	YES	YES	YES
Constant	3,041.235*** [29.863]	3,039.304*** [30.138]	3,011.900*** [31.125]	3,073.831*** [29.859]	3,072.800*** [31.264]	3,000.044*** [30.975]
R2	0.023	0.023	0.021	0.021	0.022	0.021
Nobs	340,984	343,624	347,948	362,651	367,719	369,885

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

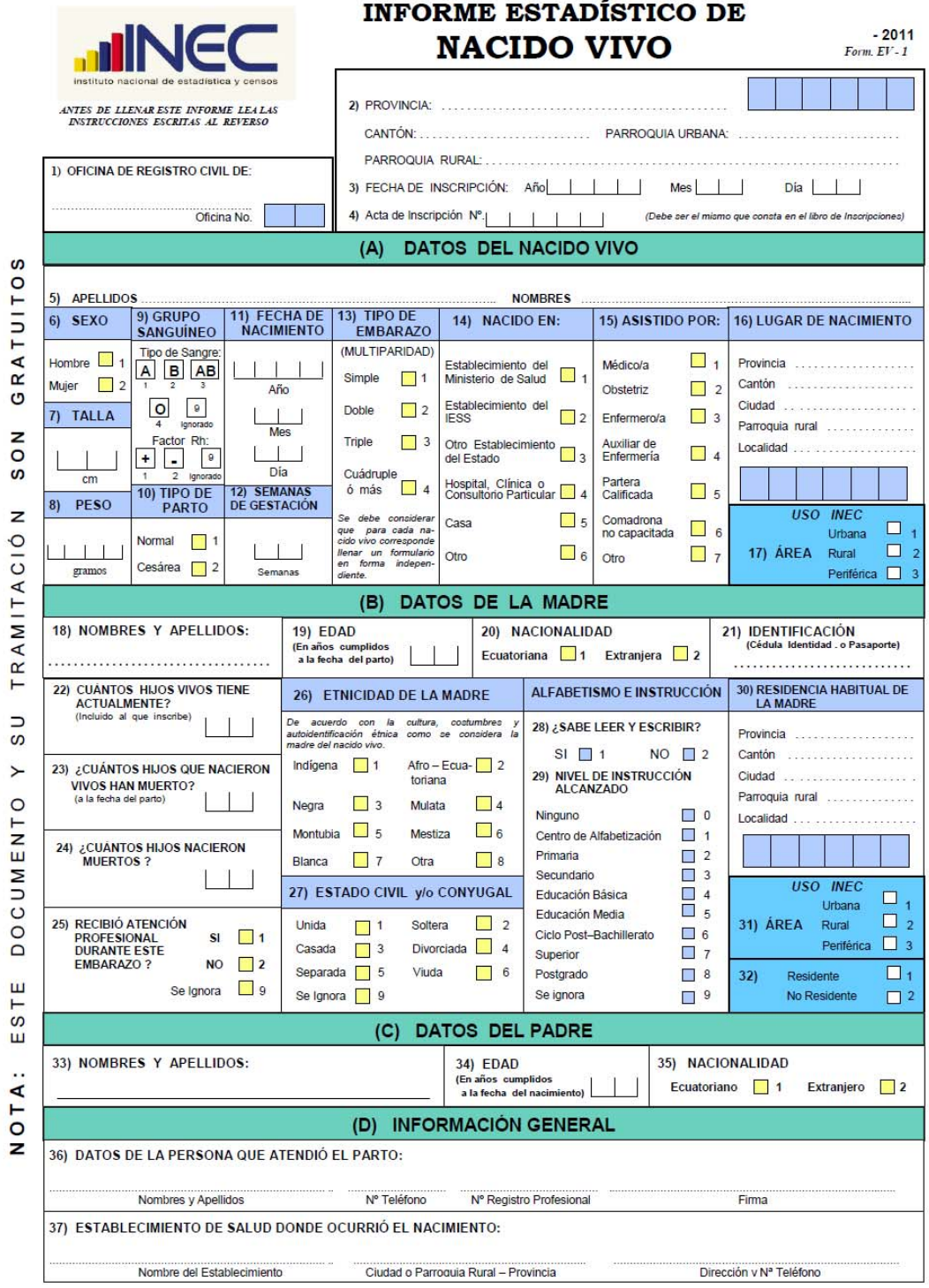
Table 7A: Comparing different immigrant groups to natives in Spain

	Birth Weight 2000	Birth Weight 2001	Birth Weight 2002	Birth Weight 2003	Birth Weight 2004	Birth Weight 2005
EC_img	55.002***	88.984***	85.035***	91.106***	111.916***	115.858***
	[9.965]	[6.858]	[5.722]	[5.108]	[4.978]	[5.243]
ROM_img	74.678***	39.520**	43.863***	45.935***	33.546***	58.323***
	[21.692]	[16.108]	[11.335]	[8.548]	[7.346]	[6.323]
MOR_img	141.978***	143.103***	137.725***	137.442***	138.467***	151.263***
	[6.869]	[6.378]	[5.837]	[5.321]	[4.847]	[4.591]
Male	118.282***	118.655***	115.983***	116.560***	116.686***	115.657***
	[1.621]	[1.611]	[1.607]	[1.566]	[1.558]	[1.550]
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
year dummies	YES	YES	YES	YES	YES	YES
province of residece of the mother	YES	YES	YES	YES	YES	YES
Constant	3,033.471***	3,027.575***	3,011.121***	3,054.505***	3,045.848***	2,967.969***
	[27.521]	[27.632]	[28.214]	[26.826]	[28.292]	[27.076]
Observations	350,780	354,873	361,800	379,315	387,789	392,895
R-squared	0.024	0.024	0.022	0.023	0.023	0.023

Table 8A: Comparing different immigrant groups to natives in Spain (2001-2002)

	Birth Weight	Low birth Weight	Gestational age	Preterm birth	Death before 24 hours	Male
EC_img	86.798*** [4.388]	-0.013*** [0.002]	-0.007 [0.016]	0.001*** [0.000]	0 [0.000]	0.002 [0.005]
ROM_img	43.147*** [9.252]	0.013*** [0.004]	-0.160*** [0.034]	0.004*** [0.001]	0.002*** [0.001]	0.002 [0.010]
MOR_img	140.183*** [4.304]	-0.016*** [0.002]	0.240*** [0.017]	0 [0.000]	0.001*** [0.000]	0 [0.004]
Male	117.301*** [1.138]	-0.011*** [0.001]	-0.060*** [0.004]	0 [0.000]	0.000*** [0.000]	
age dummies	YES	YES	YES	YES	YES	YES
monthly dummies	YES	YES	YES	YES	YES	YES
year dummies	YES	YES	YES	YES	YES	YES
province of residece of the mother	YES	YES	YES	YES	YES	YES
Constant	3,017.229*** [19.753]	0.102*** [0.009]	38.779*** [0.075]	0.003* [0.001]	0 [0.001]	0.528*** [0.020]
Observations	716,673	716,673	648,137	648,137	716,673	716,673
R-squared	0.023	0.002	0.009	0	0	0

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)

NOTA: ESTE DOCUMENTO Y SU TRAMITACIÓN SON GRATUITOS

(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

USO INEC

17) ÁREA: 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, Soltera 2, Casada 3, Divorciada 4, Separada 5, Viuda 6, Se Ignora 9

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

USO INEC

31) ÁREA: 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 .....

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) **Área**.- 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).
ALFABETISMO 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.

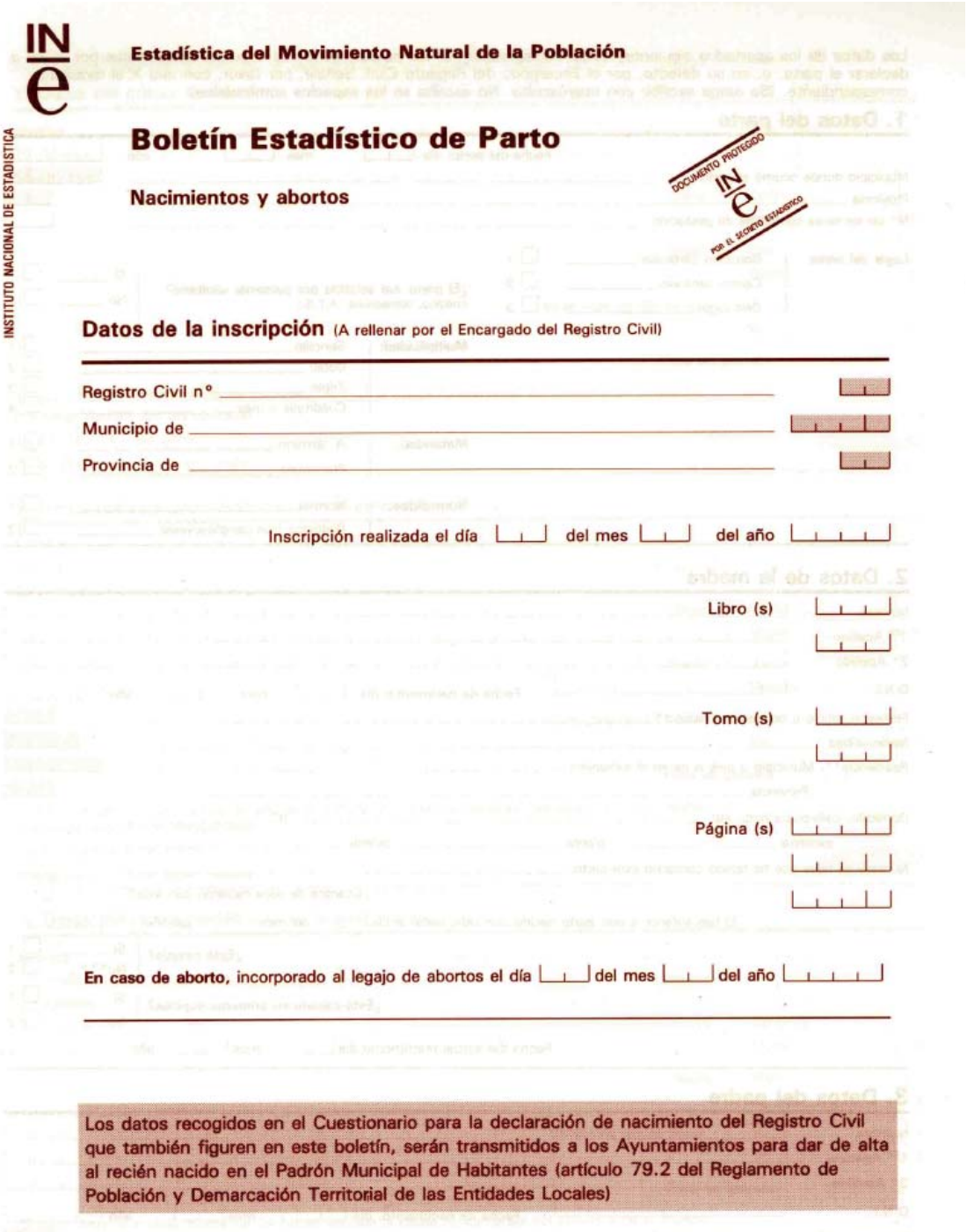
(C) DATOS DEL PADRE

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
2º 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
2º 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
2º 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 nº

* 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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