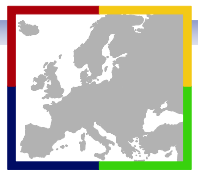

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A comparative study on fertility among the descendants of immigrants in Europe

Hill Kulu, Tina Hannemann, Ariane Pailhé, Karel Neels, Leen Rahnu, Allan Puur, Sandra Krapf, Amparo González-Ferrer, Teresa Castro-Martin, Elisabeth Kraus, Laura Bernardi, Andrés Guarin, Gunnar Andersson, Lotta Persson

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Abstract:

This study investigates the childbearing patterns of the descendants of immigrants in selected European countries, with a focus on ethnic minority women whose parents arrived in Europe from high-fertility countries. While the fertility levels of immigrants to Europe have been examined in the recent literature, the childbearing patterns among their descendants have received little attention. Using longitudinal data from eight European countries and applying Poisson regression models, the study shows that many descendants of immigrants exhibit first-birth levels that are similar to the 'native' population in their respective countries; however, first-birth levels are elevated among women of Pakistani and Bangladeshi origin in the UK and for those of Turkish descent in France and Belgium. Transition rates to a second child vary less across ethnic groups. Most ethnic minority women in the UK, France and Belgium show significantly higher third-birth levels than 'natives' in those countries. The inclusion of women's level of education in the analysis has little effect on fertility differences across the ethnic groups. Overall, the childbearing behaviour of the descendants of immigrants falls in between the fertility pathways experienced by their parents' generation and the respective 'native' populations. The analysis supports the idea that both the mainstream society and the minority subculture shape the childbearing patterns of the descendants of immigrants in Europe.

Keywords: Fertility, immigrants, the second generation, Europe, Poisson regression

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Contents

1. Introduction

European populations are characterised by an increasing share of immigrants and their descendants (Castles and Miller 2009; Rees et al. 2012). In the second half of the 20th century, immigrants mostly arrived in Northern and Western European countries, whereas in the first decade of this century, Southern European countries experienced a rapid increase of the immigrant population (Cornelius 1994; Arango 2000). Eastern European countries with state socialist regimes and planned economy showed specific patterns, but sometimes the volume of migration was quite extensive (Fassmann and Münz 1994; Frejka 1996). Over time, the share of the descendants of immigrants has also increased. In many Northern and Western European countries, immigrants and their descendants form approximately one-fifth to one-fourth of the population (Zimmermann 2005; OECD 2014). Ethnic minorities thus increasingly shape demographic, social and cultural trends in European societies.

There is extensive research examining different aspects of immigrants' lives, including their legal status and citizenship (Seifert 1997; Bauböck 2003), employment and education (Adsera and Chiswick 2007; Rendall et al. 2010), and residential and housing patterns (Musterd 2005; Arbaci 2008). There is also a growing interest in family and fertility dynamics among ethnic minorities. While the fertility of immigrants in European countries has received considerable attention in the recent demographic literature (Andersson 2004; Kulu and Milewski 2007; Sobotka 2008; Tromans et al. 2009; Milewski 2010; Mussino and Strozza 2012), the childbearing patterns among the descendants of immigrants have been little studied and understood. The few existing studies show that the descendants of immigrants from high-fertility countries usually have lower fertility levels than their parents' generation, but for some groups, fertility levels remain relatively high (Sobotka 2008; Coleman and Dubuc 2010; Milewski 2010).

This study investigates the childbearing patterns among the descendants of immigrants in selected European countries. Our main focus is on the fertility of the descendants of immigrants from high-fertility countries. We examine whether the fertility patterns of the 'second generation' are similar to those of their parents' generation or those of the 'native' population. This study extends previous research on ethnic minority fertility in the following ways. First, we conduct a comparative study on the fertility patterns of the descendants of immigrants in eight European countries to advance our understanding of the factors that

shape the childbearing patterns among the 'second generation'. Second, we disaggregate fertility measures and analyse the fertility of ethnic minorities by parity to gain information on the underlying fertility behaviour of ethnic minorities. Third, we fit a series of regression models with and without controls for demographic and socio-economic factors to improve our understanding of the role of various factors in shaping the fertility patterns of the descendants of immigrants.

2. Explaining fertility among the descendants of immigrants

The research to date has investigated the role of origin and destination country contexts in shaping immigrant fertility. Some studies have demonstrated that immigrants maintain the childbearing patterns that are dominant in their country of origin (Coleman 1994; Garsson and Nicolaas 2008), whereas others have shown that over time, immigrant fertility behaviour increasingly resembles that of natives in the destination country (Andersson 2004), although those moving from high-fertility countries to low-fertility settings tend to have larger families than the 'natives' in the destination country (Milewski 2010). The fertility behaviour of the descendants of immigrants is primarily influenced by the social environment in the country in which they grew up. However, their living environment may differ significantly. Some may grow up under the influence of *mainstream society*, while others may be raised and (mostly) live under the influence of the *minority subculture*, if such a subculture exists.

Research should therefore determine whether the childbearing behaviour of the descendants of immigrants from high-fertility societies is similar to that of their parents (and their country of origin) or to the patterns that dominate in the mainstream society. If immigrants and their descendants exhibit similar fertility behaviour, which significantly differs from that of the 'native' population, we could assume that the descendants of immigrants were mostly raised under the influence of the minority subculture (Kulu and González-Ferrer 2014). In contrast, if we observe similar patterns for the descendants of immigrants and the 'natives', we can conclude that the descendants of immigrants have mostly been influenced by the mainstream society (Kulu and González-Ferrer 2014). If both the minority subculture and mainstream society have been important (potentially at various stages in an individual's life, e.g., the minority subculture at earlier ages and the mainstream society later), the 'second generation' should show fertility levels that are in between those of immigrants and 'natives'. Such a comparison assumes some differences in fertility levels between the two reference groups,

which may be true for immigrants from high-fertility countries in low-fertility settings (e.g., Turkish immigrants in Germany), but not for those who have moved between two countries with similar fertility levels (e.g., Romanians in Spain), although a detailed analysis of childbearing patterns may still reveal some important differences between the groups (e.g., the timing of family formation).

What are the factors that explain the fertility patterns among the descendants of immigrants? Relatively high fertility levels among some ethnic minority groups may be explained by the fact that they come from large families, they may have grown up in a 'high-fertility' culture and extended family may play an important role in their lives (Penn and Lambert 2002; Robson and Berthoud 2006; Fernández and Fogli 2006). Extended family can support young mothers with children, particularly by providing help with childcare when needed. Extended family may also encourage ethnic minority women to have large families, and among some ethnic groups (e.g., Pakistani and Bangladeshi in the UK), they may encourage a couple to continue childbearing until they have at least one and preferably two sons (Hampshire et al. 2012). Similarly, normative factors may be responsible for a desire for small families among the descendants of immigrants who grew up under the influence of a 'low-fertility' mainstream society.

While most research on immigrant and ethnic minority fertility tends to emphasise the importance of *cultural factors*, it is possible that *education* and *employment*-related *factors* may play a key role in shaping the fertility behaviour of the descendants of immigrants. Successful structural integration suggests that high educational aspirations and increased opportunity costs may lead to a significant postponement of family formation and smaller family size among ethnic minority women, thus following the trends for 'natives' in European countries. In contrast, poor employment prospects among some ethnic minority groups due to inferior education and hidden discrimination in the labour market may promote early onset and high completed fertility. Young ethnic minority women may decide to choose the 'motherhood track' to find meaning for their lives and justify their lives to others. For example, research in the UK shows that women of Pakistani and Bangladeshi ethnic origin equate 'housewife' with high status (Salway 2007). While such a belief may be consistent with traditional gender roles in South Asian communities (Hennink et al. 1999), it may be equally explained by the poor employment options among ethnic minority women.

The *welfare state setup* and *policies* have been shown to shape fertility trends and patterns in Europe and other industrialised countries (Hoem 1993; Neyer and Andersson 2008; McDonald 2006; Luci and Thevenon 2013). State policies may matter for the fertility behaviour of migrants as well (see Andersson and Scott 2005). In addition, similarly to the 'native' population, the descendants of migrants are exposed to the state welfare policies in their home country since early childhood. Thus, state policies may explain whether and how much convergence towards the 'native' baseline has taken place among the descendants of immigrants. The effect of the 'mainstream society' on the descendants of immigrants can be assumed to be stronger in countries with inclusive integration policies and a range of policies that reduce inequalities between population subgroups and promote equality in all spheres of society than in countries with exclusionist integration policies or where market forces are expected to (mostly) dominate individuals' lives (Esping-Andersen 1990; Seifert 1997). Thus, the existence of state policies or the lack of them may explain high fertility rates among some ethnic minority women. For example, high residential segregation (with the weakest schools in ethnic minority areas) or selective school systems (where selection takes place at a very early age, leaving little chance for minority children to excel) may lead to poor educational outcomes among ethnic minority populations. Ethnic minority women with poor employment prospects may decide on the 'motherhood track', particularly if family policies encourage women to stay at home with children. In contrast, low educational segregation between population subgroups and state policies that encourage women's employment and support the compatibility of employment and parenthood, in turn, may explain a lack of high fertility among ethnic groups in a country (Kulu and González-Ferrer 2014).

3. Childbearing among the descendants of immigrants in Europe

Previous research has shown that the descendants of some immigrants have fertility levels that are similar to those of the 'native' population, but there are also ethnic minorities, predominantly those of 'non-Western' origins, with early childbearing and relatively high fertility levels (Sobotka 2008). Milewski (2010) analysed the fertility levels of the 'second generation' in Germany and showed that there were few (if any) differences between the childbearing behaviour of the descendants of immigrants from Southern Europe and 'native' Germans, whereas those of Turkish descent exhibited distinct childbearing patterns. Those of Turkish descent had their first child much earlier than other population groups, and the likelihood of having a first and a third child was much higher than among the 'native'

population. Scott and Stanfors (2011) investigated the fertility levels of ethnic minorities in Sweden. Their analysis showed that the descendants of immigrants in general had somewhat lower first-birth rates than the 'native' Swedish population. Only a limited number of groups of descendants from few high-fertility countries had higher first-birth rates than the 'native' Swedish population or other ethnic minority groups.

A study by Coleman and Dubuc (2010) on ethnic minority fertility in the UK showed that fertility levels significantly declined among ethnic minority populations in Britain in the last decades of the 20th century. Furthermore, for each ethnic group, fertility levels were lower among the descendants of immigrants than immigrants. However, fertility levels were low among women of Indian and Caribbean origin, but still relatively high among women of Pakistani and Bangladeshi descent. Garssen and Nicolaas (2008) found similar results in their study of the childbearing patterns of women of Turkish and Moroccan origin in the Netherlands. The analysis showed that immigrant women had significantly higher fertility levels than the 'native' Dutch population, while the 'second generation' exhibited fertility levels that were in between of those of immigrants and 'natives'. Finally, Milewski (2011) analysed the family formation of women of Turkish descent in seven European countries and showed that they had high first-birth levels in all seven countries. However, there were also significant differences across countries: 'second-generation' Turkish women had somewhat higher first-birth rates in Sweden, France and the Netherlands and lower levels in Germany and Switzerland. Thus, the study provided evidence of both socialisation into a minority subculture as well as into the mainstream society.

In summary, previous research shows that many ethnic minority groups in Europe have fertility levels that are similar to the 'native' population; the descendants of immigrants from high-fertility countries have lower fertility rates than their parents' generation, but for some groups, fertility levels are still higher than for the 'native' population. This study examines childbearing patterns among the descendants of immigrants in selected European countries, with a particular focus on ethnic minority women whose parents arrived from high-fertility countries. This comparative analysis of fertility patterns combines data from eight European countries: the UK, France, Germany, Belgium, Switzerland, Sweden, Spain and Estonia. The countries represent both 'old' and 'new' immigration countries; they vary by welfare state setup and policies; they differ in their post-war political and economic histories; and they represent all of the major regions and fertility regimes of Europe. The diversity of countries

offers the opportunity to detect similarities and differences across European countries and to gain a better understanding of the factors that shape the childbearing patterns among the descendants of immigrants. Another contribution of this study is the analysis of ethnic minority fertility by parity with and without controls for demographic and socio-economic factors. Parity-specific analysis provides rich information on the fertility behaviour of the descendants of immigrants. To the best of the authors' knowledge, no previous study on the childbearing patterns of ethnic minorities has combined a comparative approach with a parity-specific analysis.

4. Data

This study uses data from eight European countries: the UK, France, Germany, Belgium, Switzerland, Sweden, Spain and Estonia. Data for the UK are derived from the first wave (2009/2010) of the Understanding Society study, which collected retrospective information on the partnership and fertility histories of the British population, including a boost sample for the main ethnic groups. For France, data from two different sources were combined: the Trajectories and Origins survey, which was conducted in 2007 by the French National Institute of Demography and the French National Statistical Office, and the Family and Housing Survey, which was another retrospective study that was carried out by the National Institute of Statistics and Economic Studies in 2011. The German data come from the Mikrozensus of 2005 and 2009, which was a one percent sample of all German households. The fertility histories of German women were reconstructed using the 'own-children method'. For Belgium, we use the 2001 census data, which contain information on the full fertility histories for women[1]. The Swedish data are derived from the Swedish Population Register, which includes information on all of the main life events of individuals, including the birth of children. For Spain, this study exploits data from the Fertility and Values Survey, which was conducted by the Centre for Sociological Research in 2006. Finally, data for Estonia were retrieved from two retrospective studies: the Estonian Generation and Gender Survey (2004/2005) and the Estonian Family and Fertility Survey (1994).

This study investigates fertility by parity among the descendants of immigrants in eight European countries. In total, there are as many as fifty population subgroups for the analysis

[1] We would like to thank Didier Willaert for providing supplementary information on the Belgian census data.

of first birth. For some countries, groups of 'natives', immigrants (the 'first generation') and their descendants (the 'second generation') are included, while for other countries, data are only available for 'natives' and the descendants of immigrants. The UK data distinguish among four groups of origin for both immigrant generations: 1) Europe and other industrialised countries; 2) India; 3) Pakistan and Bangladesh; and 4) Caribbean countries. For France, the following groups of own and their parental origin are investigated: 1) Maghreb states; 2) Sub-Saharan Africa; 3) Turkey; and 4) Southern Europe. The German data include only one ethnic minority group – women of Turkish descent. The main groups of origin for 'first' and 'second generation' in Belgium are: 1) Italy; 2) Morocco; and 3) Turkey. For Switzerland, there are also three groups of immigrants and their descendants: 1) former Yugoslavia and Turkey; 2) Western Europe; and 3) Southern Europe. The data on the Swedish minority populations consist of the descendants of immigrants from: 1) Finland; 2) former Yugoslavia; 3) Turkey; and 4) Iran. For Spain, which has experienced immigration only recently, this study distinguishes among three groups of immigrants who arrived in Spain at age 15 or younger (the '1.5 generation'): 1) the EU and North America; 2) Maghreb; and 3) Latin America. Data on the analysed immigrant population as well as their descendants in Estonia consist of the Russian-speaking population of Slavic origin (ethnic Russians, Ukrainians and Belorussians).

Our research sample consists of women born between 1940 and 1989, and the data are categorised into five 10-year birth cohorts. For three countries, information was available for a shorter cohort range: for Germany, 1965–1989; for Sweden, 1952–1997; and for Spain, 1950–1989. Therefore, sensitivity analysis was conducted to determine the effect of different cohort ranges on the results (i.e., 1940–1989, 1950–1989, 1960–1989). The analysis showed that the results only slightly changed (the confidence intervals for the parameters were the most predominant changes); therefore, for the sake of the sample size, the full cohort range (available for the most countries), that is, women born between 1940 and 1989, is used for this analysis. Another issue was that the sample size significantly varied across countries, with approximately seven thousand for Switzerland and Estonia, approximately 977 thousand for Sweden and 2.8 million for Belgium (Table 1). In a preliminary analysis, different weights were applied to account for the different sample sizes. Again, the results did not change significantly – the most common change was that the confidence intervals around the parameters increased or decreased when we applied sample weights. Because our main interest is the fertility of ethnic groups and we have included only a few control variables, we

decided to use the original sample sizes despite the differences across countries. This step suggests that the estimates for the baseline and control variables are largely shaped by the Swedish and Belgian samples.

(Table 1 about here)

5. Methods

We use the count-data approach to investigate fertility by parity in eight European countries. This approach is preferred to merge data from different countries and conduct a data analysis when individual-level data cannot be released to another research group or country. The count-data approach can be used to compare fertility rates across population subgroups and countries with and without standardising the rates to individual characteristics. An event-time (or occurrence-exposure) table for each country is prepared, which is defined by a cross-classification over a set of time intervals and covariate categories (Preston 2005). The data for each cell in such a table include the total number of events, E_{jk}; the total time (normally person-years) at risk, R_{jk}; and values of covariates, x_{jk}, for time period j and category k. For each cell, the ratio of the number of events to the risk-time is a crude hazard:

$$\lambda_{jk} = E_{jk} / R_{jk} \qquad (1)$$

where λ_{jk} is the hazard for category k in time period j. Let E_{jk} denote the number of first births for group k in age group j. We treat E_{jk} as the realisation of a Poisson random variable with the mean μ_{jk}:

$$\mu_{jk} = \lambda_{jk} \times R_{jk} \qquad (2)$$

The expected number of first births is, thus, the product of the hazard of first birth and exposure time. We can present the model in a log-linear format:

$$\ln \mu_{jk} = \ln \lambda_{jk} + \ln R_{jk} \qquad (3)$$

We then rearrange the equation to investigate the hazard of first birth:

$$\ln\left(\mu_{jk}/R_{jk}\right) = \ln \lambda_{jk} \qquad (4)$$

Finally, we present a log-linear model for the hazard of first birth while also including additional covariates:

$$\ln \lambda_{jk} = \alpha_j + x'_k \beta \qquad (5)$$

where α_j = ln, λ_j measures the hazard of first birth by age (the 'baseline'), $\mathbf{x}'_k$ is a vector of the covariates (migrant status and country combined, cohort and educational level) and $\boldsymbol{\beta}$ represents a vector of the parameters to measure their effects. For higher order births (i.e., second and third), α_j measures the hazard of the *n*th birth by time since previous birth, and the individual's age at first birth can be included in the analysis as an additional covariate.

We used individual-level data to calculate aggregated exposure-occurrence tables for each country, which were aggregated using different combinations of socio-demographic variables. Individuals became under risk at age 15 and were censored at age 45 or the last data collection date, whichever came first. In the case of Germany, the data source only allowed us to observe women from their 18th birthday onwards, and their life histories were censored at age 40. All country files were then merged into one common database and modelled using a Poisson regression model (5). The variables that were used to prepare the exposure-occurrence tables were as follows: migrant group (specific to country, see data section), birth cohort (1940-49, 1950-59, 1960-69, 1970-79, 1980-89), age group (15-19, 20-24, 25-29, 30-34, 35-44) or time since previous birth in years (0-1, 1-3, 3-5, 5-10, 10+), educational level (low, medium and high, according to ISCED (1997) levels 0-2, 3-4 and 5-6) and for higher order births, the woman's age at first birth (15-19, 20-24, 25-29, 30-44). Table 2 provides the size of the risk population and the number of events and person-months for each birth (first, second and third) in the eight countries by migrant group. In most cases, the available risk population decreases when proceeding with the investigation to higher order births because women who did not experience a previous birth are no longer included in the new risk population (e.g., childless women are not under risk to experience a second birth). In the case of Germany, two similar size sample sets were drawn from the original data source for the analysis of first and second births.

(Table 2 about here)

6. Results

First birth

For the analysis of first births, all childless women are at risk. The first model only controls for age (baseline) and cohort. *Native* British women are the reference group in all comparisons. We see that first-birth rates are similar for 'native' women in the UK, France, Sweden and Belgium (Table 3 and Figure 1). The first-birth rates are relatively low in Germany, Switzerland and Spain and high in Estonia, as expected. The results are consistent with well-known differences in the timing and level of family formation across European countries (Billari and Kohler 2004; Toulemon et al. 2008; Adsera 2011). *Immigrants* from Pakistan and Bangladesh in the UK and those from Turkey in France, Belgium and Germany exhibit significantly higher first-birth rates than most other population subgroups, which is expected, given that they arrived in Europe from high-fertility societies. The patterns vary among the *descendants* of immigrants. For most ethnic minority groups, first-birth rates are relatively similar to those of 'natives' in the respective countries or slightly lower. First-birth risks are relatively high among women of Pakistani and Bangladeshi descent in the UK and for those of Turkish origin in France and Belgium. Interestingly, first-birth levels are also higher among the descendants of Turkish immigrants in Germany and Switzerland than those of 'natives', but they are not particularly high in comparison with similar groups in other European countries. In Sweden, women of Turkish descent exhibit first-birth levels similar to those of 'natives'. Children of immigrants from Latin America and industrialised countries have somewhat higher first-birth levels than 'natives' in Spain, although the levels are low in comparison with other countries. The Russian-speaking population in Estonia has relatively high first-birth risks, which are related to specific patterns in Eastern Europe in general, namely, early and universal childbearing. Interestingly, a significant contrast between Russian-speaking immigrants and native Estonians only emerges in the 'second generation'.

(Table 3 about here)

(Figure 1 about here)

Model 2 controls for the women's educational level. The differences in first-birth levels between 'natives', immigrants and the descendants of immigrants slightly decline, but remain significant. Briefly, high fertility among some ethnic minority women is only slightly explained by their lower educational levels. The effects of all of the control variables are as

expected. First-birth rates are the highest in the second half of the twenties, they are higher among older than younger cohorts and they decline with increases in the women's level of education. In a further analysis, we distinguished between first-birth rates at ages 15-24 and 25-44 to detect possible differences in the timing of family formation among population subgroups. The analysis supported both earlier entry into motherhood and lower levels of childlessness among women of Turkish origin in France and Belgium and those of Pakistani and Bangladeshi descent in the UK (results are available upon request).

Second birth

Women who had a first child form the risk population for the study of second births. The analysis uses data from seven countries because no data for the transition to second births were available for Switzerland. The first model controls only for the time since first birth as the baseline and birth cohorts. Again, 'native' women in France, Belgium and Sweden exhibit similar second-birth risks, with somewhat higher levels for 'native' British women (Table 4 and Figure 2). Women in Germany, Spain and Estonia have relatively low second-birth levels. The observed patterns are consistent with the variation in second childbearing across European countries reported in previous studies (Van Bavel and Różańska-Putek 2010; Klesment et al. 2014). Immigrants from Pakistan and Bangladesh in the UK, those from Turkey in France and those from Turkey and Morocco in Belgium have significantly higher second-birth rates than most of the other groups in the respective countries, suggesting that the majority of women who become mothers have a second child. Again, the patterns vary among the *descendants* of immigrants. The descendants of immigrants from Pakistan and Bangladesh exhibit high second-birth levels, similar to their parents, whereas second-birth rates are somewhat lower among women of Turkish origin in France and Belgium, similar to those of 'natives' in the respective countries. The descendants of Turkish immigrants in Germany and Sweden show second-birth risks that are similar to those of 'natives', while children of immigrants from the Maghreb region in Spain have somewhat higher fertility levels than 'natives'.

The analysis also shows that a number of the 'second-generation' groups have low second-birth levels: Caribbeans in the UK, Sub-Saharan Africans in France, Italians in Belgium, Latin Americans in Spain and the Russian-speaking population in Estonia. Several 'second-generation' groups of European descent (South Europeans in France, Italians in Belgium, Russian-speakers in Estonia) exhibit lower second-birth rates than their counterparts in the

'first generation', and hence, an increased difference from the native population in the respective countries. Model 2 additionally controls for the women's age at first birth and their educational level. Interestingly, for some groups, the fertility differences relative to 'native' British women slightly decline, while for others they slightly increase, although the changes are not large. Further analysis showed that some unexpected changes are related to the inclusion of education in the analysis. Second-birth rates are the highest (rather than the lowest) among highly educated women showing shorter birth intervals (rather than higher parity progression levels) among the majority population of the respective countries.

(Table 4 about here)

(Figure 2 about here)

Third birth

Information on third births was available for four countries: the UK, France, Belgium and Estonia. The analysis shows that third-birth levels are relatively similar for 'natives' in the UK, France and Belgium; the levels are somewhat lower for Estonia, as expected (Table 5 and Figure 3). A number of immigrant groups exhibit very high third-birth risks: women from Pakistan and Bangladesh in the UK, immigrants from Turkey and Sub-Saharan Africa in France and those from Turkey and Morocco in Belgium. Fertility rates are also relatively high among immigrants from other non-European countries: Indians and Caribbeans in the UK and those from the Maghreb states in France. Interestingly, most *descendants* of immigrants also show relatively high levels. Third-birth rates are high among women of Pakistani and Bangladeshi descent in the UK and also among those of Indian and Caribbean origin. Similarly, elevated third-birth rates are observed among the descendants of immigrants from both African regions in France and Morocco in Belgium. In contrast, third-birth rates are low for Southern Europeans in France and Belgium and for Russian-speaking women in Estonia. Model 2 additionally controls for the women's educational level and age at first birth. The fertility differences between ethnic groups slightly decline, but the main differences persist. The effects of the covariates are largely as expected. Third-birth rates are highest one to three years after the birth of the second child, and they are higher for younger than for older cohorts. The rates also decline with increases in the women's age at first birth; interestingly, the rates are higher among women with the lowest and highest educational levels.

(Table 5 about here)

(Figure 3 about here)

7. Summary and discussion

This study investigated fertility among the descendants of immigrants in selected European countries, with a focus on ethnic minority women whose parents arrived in Europe from high-fertility countries. The main results are as follows. First, many of the descendants of immigrants exhibited first-birth levels that were similar to the 'native' population in their respective countries; however, first-birth levels were elevated among women of Pakistani and Bangladeshi origin in the UK and for those of Turkish descent in France and Belgium, which suggests early childbearing and a higher likelihood of becoming a mother among these ethnic groups. Second, transition rates to a second child varied less across the descendants of immigrants; only women of Pakistani and Bangladeshi ethnic origin in the UK exhibited elevated second-birth levels. Third, most ethnic minority women in the UK, France and Belgium showed significantly higher third-birth levels than 'natives' in those countries. Fourth, the inclusion of the women's education in the analysis slightly changed the results, but the main differences across the ethnic groups persisted.

The following groups of the descendants of immigrants can be distinguished based on their fertility patterns. Women of Pakistani and Bangladeshi origin in the UK showed consistently high fertility levels; their first-, second- and third-birth levels were significantly higher than those of 'native' women in the UK. Similarly, women of Turkish descent in France and Belgium exhibited high first-birth rates; their second- and third-birth levels were somewhat lower, although still higher than those among the respective 'natives' in each country. Indians in the UK and those of North African origin in France and Belgium had first- and second-birth rates that were similar to 'natives', but significantly higher third-birth levels. Finally, Caribbeans in the UK and Sub-Saharan Africans in France had first-birth levels that were similar to 'natives', low second-birth rates and relatively high third-birth levels, suggesting a polarisation among women of these groups by fertility behaviour.

The analysis supported the idea that both the *mainstream society* and the *minority subculture* have shaped the childbearing patterns of the descendants of immigrants in Europe. Overall, the descendants of immigrants from high-fertility countries had lower parity-specific fertility

than their parents' generation. Furthermore, in Sweden and Germany, the 'second generation' exhibited fertility levels that were very similar to or even lower than those of natives. However, we also observed relatively high first-birth rates for some and high third-birth rates for many ethnic minority women, which suggest that factors specific to ethnic minorities have also shaped fertility patterns. What are the factors that explain the higher fertility rates for some ethnic minority women? We expected that education would explain a larger share of the high fertility among ethnic minority women. However, this was not the case. The inclusion of women's educational level in the models slightly reduced the fertility differences between ethnic groups, but the main differences persisted. It is possible that factors directly related to employment played a key role; however, previous research suggests that the inclusion of employment status in the models would not change the patterns significantly (Bernhardt 1993; Hamel and Pailhé 2015). A number of cultural factors may (further) explain fertility variations across ethnic group and the high fertility levels among some ethnic minority women. Many ethnic minority women with high fertility levels come from large families and are more religious than 'natives'. Research shows that individuals who come from larger families are more likely to have larger families, and those who are more religious have higher fertility levels, particularly third-birth rates (Michael and Tuma 1985; Philipov and Berghammer 2007).

Our analysis also supported the idea that the *country context* matters both in shaping overall fertility levels and differences across population subgroups. The analysis showed that first-birth rates were relatively low for all ethnic minority groups in Germany, Switzerland and Spain, suggesting later family formation and/or a lower likelihood of becoming a mother in those countries, which is a well-known finding from previous studies; in contrast, all of the population subgroups in Estonia exhibited early and universal childbearing, as expected, whereas second- and third-birth levels were relatively low. Fertility variation across ethnic groups was the smallest in Sweden and the largest in France, the UK and Belgium. The former finding is not surprising; research has shown that the generous and universal Nordic welfare system has an equalising effect on all population subgroups; furthermore, ethnic minorities are relatively well integrated into education and the labour market in those countries, and residential segregation levels are relatively low (Bevelander 2004). Welfare state policies have likely reduced differences across population subgroups in the UK and France; however, the size of the main minority groups is large in those countries and residential and school segregation is high, particularly in the UK (Musterd 2005; Pan Ké

Shon and Verdugo 2015). These factors certainly promote the existence of minority 'subcultures' in those countries and reinforce specific family patterns, e.g., through high levels of ethnic intermarriages.

We conducted a series of analyses to determine how sensitive the results of a comparative study of eight countries are to different sample selections and model specifications. We applied different weights to countries, simultaneously used a set of different countries, fitted models with and without immigrants, used 'natives' from different countries as a reference group and explored the shape of the baseline risk (the woman's age or time since previous birth) for population subgroups. Overall, the results on second- and third-birth rates were robust to different sample selections and model specifications. However, there was some variation across first-birth models for some ethnic groups. The estimated first-birth rates for women of Pakistani and Bangladeshi descent in the UK and those of Turkish origin in France and Belgium varied across models. The differences in first-birth risks between them and the 'native' population were larger without weights and smaller when we applied weights to account for different sample sizes across countries (see Table A1 in Appendix). For example, the first-birth levels for the descendants of Pakistani and Bangladeshi immigrants were only slightly higher than those of British 'native' women when we only used the sample of the British and French women; the differences increased when we included all other countries in the analysis.

The reason for such a variation is that the timing of family formation seems to significantly vary across ethnic groups (which is an interesting finding per se), and it is therefore not easy to find a common baseline for all groups and countries. An obvious solution would be to allow different baselines for different groups or to estimate separate models for different age groups (e.g., 15-29 versus 30-44). However, our further analysis showed that these strategies may not work well either. The 'second generation' mostly comes from younger cohorts, and there are only a few among them who have reached older (childbearing) ages; this figure also varies across groups. Our sensitivity analysis therefore suggests that the results of the first birth and particularly the elevated fertility levels for some groups should be interpreted with some caution. The estimated second- and third-birth rates are robust to different sample selections and model specifications.

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Tables and Graphs

Table 1: Number of women by country

Country	Number of women
United Kingdom	18636
France	154967
Germany	24114
Belgium	2755211
Switzerland	7114
Sweden	977095
Spain	12024
Estonia	7233
Total	**3956394**

Table 2: Number of women at risk, events and person-months by migrant groups for conception leading to first and second birth

		Conception leading to first birth			**Conception leading to second birth**		
		Risk population	Events	Person-months	Risk population	Events	Person-months
United Kingdom	Native	14866	11499	2022960	11184	8838	569256
	1G Europe & West	699	442	109964	417	312	20418
	1G India	447	339	59015	331	258	14298
	1G Pakistan & Bangladesh	733	662	72760	642	553	21183
	1G Carribean	160	137	19459	136	101	10068
	2G Europe & West	772	576	116264	561	422	31297
	2G India	320	208	44285	199	163	8131
	2G Pakistan & Bangladesh	366	208	36579	196	157	4873
	2G Carribean	273	206	38194	199	131	15555
	Total	**18636**	**14277**	**2519480**	**13865**	**10935**	**695079**
France	Native	133583	99121	19326708	97558	70205	7085020
	1G Maghreb	3884	3269	516775	3220	2510	229508
	1G Sub-Saharan Africa	2368	1873	301600	1828	1352	97474
	1G Turkey	1196	1063	112912	1036	894	36265
	1G Southern Europe	676	593	87612	590	466	45364
	2G Maghreb	4973	2918	675717	2858	1929	141772
	2G Sub-Saharan Africa	673	264	72377	260	134	10525
	2G Turkey	481	270	48023	262	162	9111
	2G Southern Europe	7133	5183	1044516	5103	3497	388432
	Total	**154967**	**114554**	**22186240**	**112715**	**81149**	**8043471**
Germany	Native	22933	9006	2467174	22169	12263	1141857
	1G Turkey	807	599	62768	1650	1336	77928
	2G Turkey	374	109	25356	280	129	11749
	Total	**24114**	**9714**	**2555298**	**24099**	**13728**	**1231534**
Belgium	Native	2559399	1674251	316146357	1676248	1143824	122373507
	1G Italy	35900	30312	4080677	30484	24197	2076014
	1G Morocco	43310	32340	4845110	32752	26844	1089271
	1G Turkey	28467	23017	2293613	23337	19816	768492
	2G Italy	48779	12495	5115202	12510	4925	471109
	2G Morocco	25972	5390	1920657	5391	2477	140539
	2G Turkey	13384	3500	867466	3511	1537	101253
	Total	**2755211**	**1781305**	**335269082**	**1784233**	**1223620**	**127020185**
Switzerland	Native	5620	3060	930415			
	1G For. Yugoslavia & Turkey	99	81	14870			
	1G Western Europe	385	287	69930			
	1G Southern Europe	222	191	30327			
	2G For. Yugoslavia & Turkey	54	27	7918			
	2G Western Europe	395	251	71280			
	2G Southern Europe	339	223	56974			
	Total	**7114**	**4120**	**1181714**			
Sweden	Native	904085	367186	101943691			
	2G Finland	55374	21799	6296127			
	2G For. Yugoslavia	10064	4066	1198562			
	2G Turkey	5734	2127	699319			
	2G Iran	1838	274	233110			
	Total	**977095**	**395452**	**110370809**			
Spain	Native	5728	3297	1701564	3420	2195	262608
	1G EU, US, Canada	1779	1144	574332	1144	639	102876
	1G Maghreb	604	361	203184	361	221	31680
	1G Latin America	622	459	195564	459	325	27072
	1.5G EU, US, Canada	129	74	40188	74	57	4728
	1.5G Maghreb	2834	2019	868140	2019	1222	174144
	1.5G Latin America	328	143	97620	143	83	11724
	Total	**12024**	**7497**	**3680592**	**7620**	**4742**	**614832**
Estonia	Native	4992	4120	571846	4086	2833	298794
	1G Russian Speaker	1373	1262	155927	1251	794	130110
	2G Russian Speaker	868	674	87946	669	321	64501
	Total	**7233**	**6056**	**815719**	**6006**	**3948**	**493405**

Table 2: Number of women at risk, events and person-months by migrant groups for conception leading to third birth (continuation)

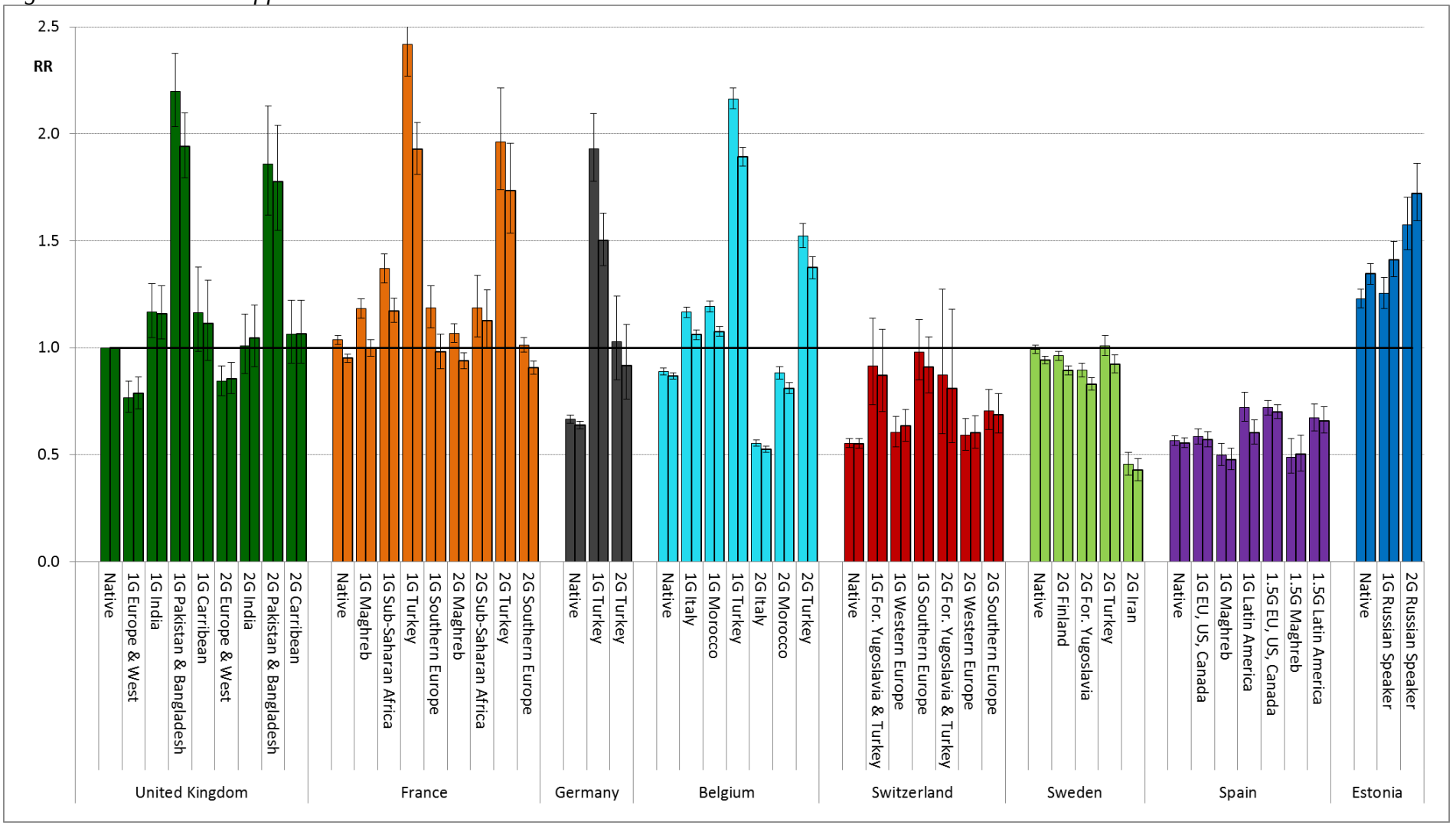
		Conception leading to third birth		
		Risk population	Events	Person-months
United Kingdom	Native	8592	3464	916908
	1G Europe & West	289	95	26552
	1G India	243	108	20431
	1G Pakistan & Bangladesh	531	380	23764
	1G Carribean	99	48	8937
	2G Europe & West	417	197	40882
	2G India	159	81	11341
	2G Pakistan & Bangladesh	147	87	6658
	2G Carribean	126	68	9393
	Total	**10603**	**4528**	**1064866**
France	Native	69283	25455	9204376
	1G Maghreb	2483	1165	325537
	1G Sub-Saharan Africa	1321	817	70328
	1G Turkey	880	607	45198
	1G Southern Europe	458	182	66873
	2G Maghreb	1894	840	118555
	2G Sub-Saharan Africa	133	52	4838
	2G Turkey	160	53	7128
	2G Southern Europe	3455	966	447462
	Total	**80067**	**30137**	**10290295**
Belgium	Native	1143771	419214	125787081
	1G Italy	24195	11731	2753772
	1G Morocco	26836	20751	1026345
	1G Turkey	19814	14257	960496
	2G Italy	4925	835	169957
	2G Morocco	2477	725	61899
	2G Turkey	1537	350	42231
	Total	**1223555**	**467863**	**130801781**
Estonia	Native	2835	1000	324261
	1G Russian Speaker	797	119	117615
	2G Russian Speaker	323	53	40108
	Total	**3955**	**1172**	**481984**

Table 3: Relative risks of first birth

Variable		Category	Model 1			Model 2		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Age group								
		15-19	0.19	***	0.19 - 0.19	0.18	***	0.18 - 0.18
		20-24	0.72	***	0.72 - 0.72	0.71	***	0.71 - 0.71
		25-29	1			1		
		30-34	0.59	***	0.59 - 0.60	0.59	***	0.59 - 0.59
		35+	0.12	***	0.12 - 0.12	0.12	***	0.12 - 0.12
Birth cohort								
		1940-1949	1.41	***	1.40 - 1.41	1.26	***	1.25 - 1.26
		1950-1959	1.24	***	1.23 - 1.24	1.17	***	1.16 - 1.17
		1960-1969	1			1		
		1970-1979	0.65	***	0.64 - 0.65	0.68	***	0.68 - 0.68
		1980-1989	0.37	***	0.37 - 0.37	0.37	***	0.37 - 0.38
Country and Migrant group	United Kingdom							
		Native	1			1		
		1G Europe & West	0.77	***	0.70 - 0.84	0.79	***	0.72 - 0.86
		1G India	1.17	***	1.05 - 1.30	1.16	***	1.04 - 1.29
		1G Pakistan & Bangladesh	2.20	***	2.03 - 2.38	1.94	***	1.79 - 2.10
		1G Carribean	1.16	*	0.98 - 1.38	1.11		0.94 - 1.32
		2G Europe & West	0.84	***	0.78 - 0.92	0.86	***	0.79 - 0.93
		2G India	1.01		0.88 - 1.16	1.05		0.91 - 1.20
		2G Pakistan & Bangladesh	1.86	***	1.62 - 2.13	1.78	***	1.55 - 2.04
		2G Carribean	1.07		0.93 - 1.22	1.07		0.93 - 1.22
	France							
		Native	1.04	***	1.02 - 1.06	0.95	***	0.93 - 0.97
		1G Maghreb	1.18	***	1.14 - 1.23	1.00		0.96 - 1.04
		1G Sub-Saharan Africa	1.37	***	1.30 - 1.44	1.17	***	1.12 - 1.23
		1G Turkey	2.42	***	2.27 - 2.57	1.93	***	1.81 - 2.05
		1G Southern Europe	1.19	***	1.09 - 1.29	0.98		0.90 - 1.06
		2G Maghreb	1.07	***	1.03 - 1.11	0.94	***	0.90 - 0.98
		2G Sub-Saharan Africa	1.19	***	1.05 - 1.34	1.13	*	1.00 - 1.27
		2G Turkey	1.96	***	1.74 - 2.21	1.73	***	1.54 - 1.96
		2G Southern Europe	1.01		0.98 - 1.05	0.91	***	0.88 - 0.94
	Germany							
		Native	0.67	***	0.65 - 0.69	0.64	***	0.62 - 0.66
		1G Turkey	1.93	***	1.78 - 2.10	1.50	***	1.38 - 1.63
		2G Turkey	1.03		0.85 - 1.24	0.92		0.76 - 1.11
	Belgium							
		Native	0.89	***	0.87 - 0.91	0.87	***	0.85 - 0.88
		1G Italy	1.17	***	1.14 - 1.19	1.06	***	1.04 - 1.08
		1G Morocco	1.19	***	1.17 - 1.22	1.08	***	1.05 - 1.10
		1G Turkey	2.16	***	2.12 - 2.21	1.89	***	1.85 - 1.94
		2G Italy	0.55	***	0.54 - 0.57	0.53	***	0.51 - 0.54
		2G Morocco	0.88	***	0.85 - 0.91	0.81	***	0.78 - 0.84
		2G Turkey	1.52	***	1.47 - 1.58	1.37	***	1.32 - 1.43
	Switzerland							
		Native	0.55	***	0.53 - 0.58	0.55	***	0.53 - 0.57
		1G For. Yugoslavia & Turkey	0.91		0.74 - 1.14	0.87		0.70 - 1.09
		1G Western Europe	0.60	***	0.54 - 0.68	0.63	***	0.56 - 0.71
		1G Southern Europe	0.98		0.85 - 1.13	0.91		0.79 - 1.05
		2G For. Yugoslavia & Turkey	0.87		0.60 - 1.27	0.81		0.55 - 1.18
		2G Western Europe	0.59	***	0.52 - 0.67	0.60	***	0.53 - 0.68
		2G Southern Europe	0.70	***	0.62 - 0.80	0.69	***	0.60 - 0.79
	Sweden							
		Native	0.99		0.97 - 1.01	0.94	***	0.93 - 0.96
		2G Finland	0.96	***	0.94 - 0.98	0.89	***	0.87 - 0.91
		2G For. Yugoslavia	0.89	***	0.86 - 0.93	0.83	***	0.80 - 0.86
		2G Turkey	1.01		0.96 - 1.06	0.92	***	0.88 - 0.97
		2G Iran	0.45	***	0.40 - 0.51	0.43	***	0.38 - 0.48
	Spain							
		Native	0.56	***	0.54 - 0.59	0.56	***	0.53 - 0.58
		1G EU, US, Canada	0.58	***	0.55 - 0.62	0.57	***	0.54 - 0.61
		1G Maghreb	0.50	***	0.45 - 0.55	0.48	***	0.43 - 0.53
		1G Latin America	0.72	***	0.66 - 0.79	0.60	***	0.55 - 0.66
		1.5G EU, US, Canada	0.72	***	0.69 - 0.75	0.70	***	0.67 - 0.73
		1.5G Maghreb	0.49	***	0.41 - 0.58	0.50	***	0.43 - 0.59
		1.5G Latin America	0.67	***	0.61 - 0.74	0.66	***	0.60 - 0.72
	Estonia							
		Native	1.23	***	1.19 - 1.27	1.35	***	1.30 - 1.39
		1G Russian Speaker	1.25	***	1.18 - 1.33	1.41	***	1.33 - 1.50
		2G Russian Speaker	1.58	***	1.46 - 1.70	1.72	***	1.59 - 1.86
Education level								
		Unknown				0.82	***	0.81 - 0.82
		Low				1		
		Medium				0.76	***	0.75 - 0.76
		High				0.63	***	0.63 - 0.63
Constant			0.012	***	0.012 - 0.012	0.017	***	0.016 - 0.017

Significance level: *** = p-value < 0.01, ** = p-value < 0.05,* = p-value < 0.1

Figure 1: Relative risks of first birth



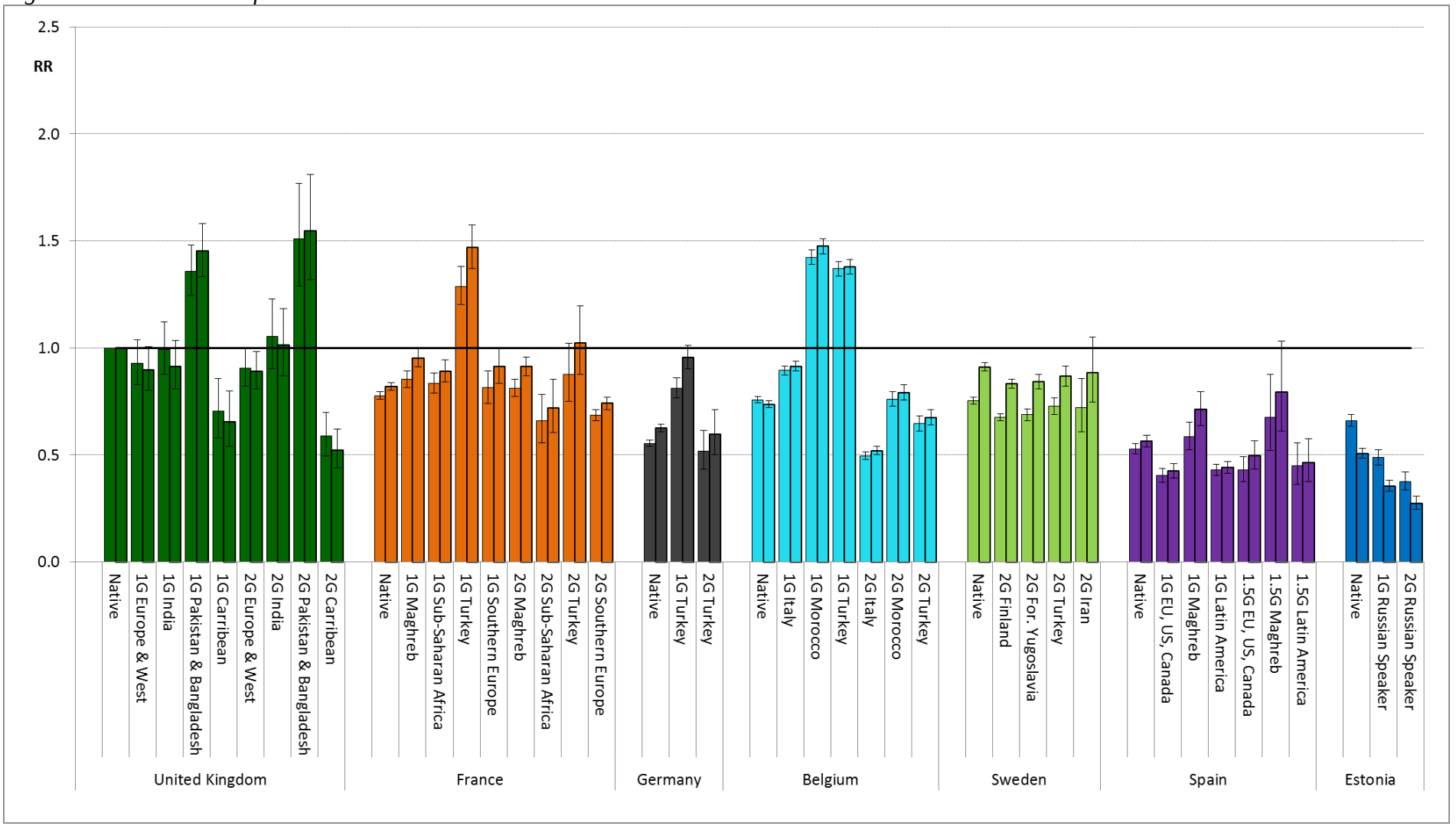
Model 1 = controlled for cohort and age group
Model 2 = controlled additionally for education

Table 4: Relative risks of second birth

Variable		Category	Model 1			Model 2		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Years since First birth		0-1	0.43	***	0.43 - 0.43	0.42	***	0.42 - 0.43
		1-3	1			1		
		3-5	0.61	***	0.61 - 0.61	0.62	***	0.62 - 0.62
		5-10	0.22	***	0.21 - 0.22	0.22	***	0.22 - 0.22
		10+	0.05	***	0.05 - 0.05	0.04	***	0.04 - 0.04
Birth cohort								
		1940-1949	0.94	***	0.94 - 0.94	0.97	***	0.96 - 0.97
		1950-1959	0.88	***	0.88 - 0.89	0.89	***	0.88 - 0.89
		1960-1969	1			1		
		1970-1979	1.08	***	1.08 - 1.09	0.96	***	0.95 - 0.96
		1980-1989	1.02	***	1.01 - 1.03	0.78	***	0.78 - 0.79
Country and Migrant group	United Kingdom							
		Native	1			1		
		1G Europe & West	0.93		0.83 - 1.04	0.90	*	0.80 - 1.00
		1G India	0.99		0.88 - 1.12	0.91		0.81 - 1.03
		1G Pakistan & Bangladesh	1.36	***	1.25 - 1.48	1.45	***	1.33 - 1.58
		1G Carribean	0.70	***	0.58 - 0.86	0.66	***	0.54 - 0.80
		2G Europe & West	0.91	**	0.82 - 1.00	0.89	**	0.81 - 0.98
		2G India	1.05		0.90 - 1.23	1.01		0.87 - 1.18
		2G Pakistan & Bangladesh	1.51	***	1.29 - 1.77	1.55	***	1.32 - 1.81
		2G Carribean	0.59	***	0.49 - 0.70	0.52	***	0.44 - 0.62
	France							
		Native	0.78	***	0.76 - 0.80	0.82	***	0.80 - 0.84
		1G Maghreb	0.85	***	0.82 - 0.89	0.95	**	0.91 - 0.99
		1G Sub-Saharan Africa	0.83	***	0.79 - 0.88	0.89	***	0.84 - 0.94
		1G Turkey	1.29	***	1.20 - 1.38	1.47	***	1.37 - 1.57
		1G Southern Europe	0.81	***	0.74 - 0.89	0.91	*	0.83 - 1.00
		2G Maghreb	0.81	***	0.77 - 0.85	0.91	***	0.87 - 0.96
		2G Sub-Saharan Africa	0.66	***	0.56 - 0.78	0.72	***	0.61 - 0.85
		2G Turkey	0.88	*	0.75 - 1.02	1.02		0.88 - 1.20
		2G Southern Europe	0.69	***	0.66 - 0.71	0.74	***	0.71 - 0.77
	Germany							
		Native	0.55	***	0.54 - 0.57	0.63	***	0.61 - 0.64
		1G Turkey	0.81	***	0.77 - 0.86	0.95		0.90 - 1.01
		2G Turkey	0.52	***	0.43 - 0.61	0.60	***	0.50 - 0.71
	Belgium							
		Native	0.76	***	0.74 - 0.77	0.74	***	0.72 - 0.75
		1G Italy	0.89	***	0.87 - 0.92	0.91	***	0.89 - 0.94
		1G Morocco	1.42	***	1.39 - 1.46	1.48	***	1.44 - 1.51
		1G Turkey	1.37	***	1.34 - 1.40	1.38	***	1.34 - 1.41
		2G Italy	0.50	***	0.48 - 0.51	0.52	***	0.50 - 0.54
		2G Morocco	0.76	***	0.73 - 0.79	0.79	***	0.76 - 0.83
		2G Turkey	0.65	***	0.61 - 0.68	0.67	***	0.64 - 0.71
	Sweden							
		Native	0.75	***	0.74 - 0.77	0.91	***	0.89 - 0.93
		2G Finland	0.68	***	0.66 - 0.69	0.83	***	0.81 - 0.85
		2G For. Yugoslavia	0.69	***	0.66 - 0.72	0.84	***	0.81 - 0.88
		2G Turkey	0.73	***	0.69 - 0.77	0.87	***	0.82 - 0.92
		2G Iran	0.72	***	0.61 - 0.86	0.89		0.75 - 1.05
	Spain							
		Native	0.53	***	0.50 - 0.55	0.56	***	0.54 - 0.59
		1G EU, US, Canada	0.40	***	0.37 - 0.44	0.42	***	0.39 - 0.46
		1G Maghreb	0.59	***	0.52 - 0.65	0.71	***	0.64 - 0.80
		1G Latin America	0.43	***	0.40 - 0.46	0.44	***	0.42 - 0.47
		1.5G EU, US, Canada	0.43	***	0.38 - 0.49	0.50	***	0.43 - 0.57
		1.5G Maghreb	0.67	***	0.52 - 0.88	0.79	*	0.61 - 1.03
		1.5G Latin America	0.45	***	0.36 - 0.56	0.46	***	0.37 - 0.58
	Estonia							
		Native	0.66	***	0.63 - 0.69	0.51	***	0.49 - 0.53
		1G Russian Speaker	0.49	***	0.45 - 0.52	0.36	***	0.33 - 0.38
		2G Russian Speaker	0.38	***	0.34 - 0.42	0.27	***	0.25 - 0.31
Education level								
		Unknown				1.13	***	1.12 1.14
		Low				1.00		
		Medium				1.13	***	1.12 1.13
		High				1.75	***	1.74 1.76
Age at first birth								
		15-19				1.13	***	1.12 1.13
		20-24				1.00		
		25-29				0.81	***	0.81 0.82
		30+				0.52	***	0.51 0.52
Constant			0.032	***	0.031 - 0.033	0.030	***	0.030 - 0.031

Significance level: *** = p-value < 0.01, ** = p-value < 0.05, * = p-value < 0.1

Figure 2: Relative risks of second birth



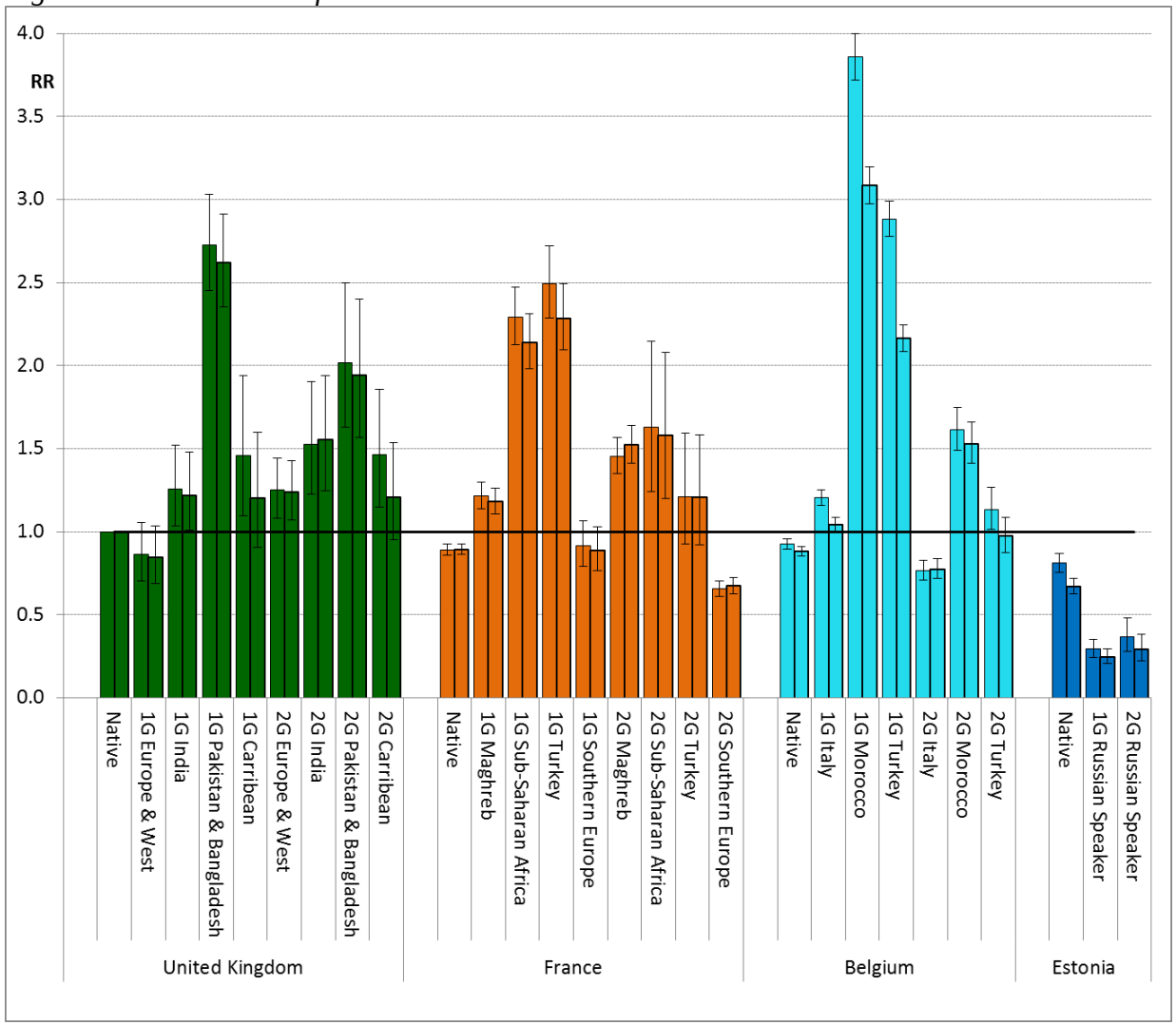
Model 1 = controlled for cohort and age group
Model 2 = controlled additionally for education and age at first birth

Table 5: Relative risks of third birth

Variable		Category	Model 1			Model 2		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Years since Second birth		0-1	0.55	***	0.55 - 0.56	0.55	***	0.55 - 0.56
		1-3	1			1		
		3-5	0.64	***	0.64 - 0.65	0.64	***	0.64 - 0.65
		5-10	0.27	***	0.27 - 0.27	0.27	***	0.27 - 0.27
		10+	0.07	***	0.07 - 0.07	0.07	***	0.07 - 0.07
Birth cohort								
		1940-1949	1.10	***	1.09 - 1.11	1.03	***	1.02 - 1.04
		1950-1959	0.89	***	0.89 - 0.90	0.85	***	0.84 - 0.86
		1960-1969	1			1		
		1970-1979	1.14	***	1.13 - 1.16	1.05	***	1.04 - 1.07
		1980-1989	1.59	***	1.50 - 1.68	1.25	***	1.18 - 1.32
Country and Migrant group	United Kingdom							
		Native	1			1		
		1G Europe & West	0.86		0.70 - 1.06	0.84		0.69 - 1.03
		1G India	1.26	**	1.04 - 1.52	1.22	**	1.01 - 1.48
		1G Pakistan & Bangladesh	2.72	***	2.45 - 3.03	2.62	***	2.35 - 2.91
		1G Carribean	1.46	***	1.10 - 1.94	1.20		0.90 - 1.60
		2G Europe & West	1.25	***	1.08 - 1.44	1.24	***	1.07 - 1.43
		2G India	1.53	***	1.23 - 1.90	1.55	***	1.25 - 1.94
		2G Pakistan & Bangladesh	2.02	***	1.63 - 2.50	1.94	***	1.57 - 2.40
		2G Carribean	1.46	***	1.15 - 1.86	1.21		0.95 - 1.54
	France							
		Native	0.89	***	0.86 - 0.92	0.89	***	0.86 - 0.93
		1G Maghreb	1.22	***	1.14 - 1.30	1.18	***	1.11 - 1.26
		1G Sub-Saharan Africa	2.29	***	2.12 - 2.48	2.14	***	1.98 - 2.31
		1G Turkey	2.50	***	2.29 - 2.72	2.29	***	2.10 - 2.49
		1G Southern Europe	0.92		0.79 - 1.07	0.89		0.76 - 1.03
		2G Maghreb	1.45	***	1.35 - 1.57	1.52	***	1.41 - 1.64
		2G Sub-Saharan Africa	1.63	***	1.24 - 2.14	1.58	***	1.20 - 2.08
		2G Turkey	1.21		0.92 - 1.59	1.21		0.92 - 1.58
		2G Southern Europe	0.66	***	0.61 - 0.71	0.67	***	0.63 - 0.72
	Belgium							
		Native	0.92	***	0.89 - 0.96	0.88	***	0.85 - 0.91
		1G Italy	1.20	***	1.16 - 1.25	1.04	**	1.01 - 1.08
		1G Morocco	3.86	***	3.72 - 4.00	3.08	***	2.97 - 3.20
		1G Turkey	2.88	***	2.78 - 2.99	2.16	***	2.08 - 2.25
		2G Italy	0.77	***	0.71 - 0.83	0.78	***	0.72 - 0.84
		2G Morocco	1.61	***	1.49 - 1.75	1.53	***	1.41 - 1.66
		2G Turkey	1.13	**	1.02 - 1.27	0.97		0.87 - 1.09
	Estonia							
		Native	0.81	***	0.76 - 0.87	0.67	***	0.63 - 0.72
		1G Russian Speaker	0.29	***	0.24 - 0.35	0.25	***	0.21 - 0.30
		2G Russian Speaker	0.37	***	0.28 - 0.48	0.29	***	0.22 - 0.38
Education level								
		Unknown				1.32	***	1.31 - 1.33
		Low				1.00		
		Medium				0.89	***	0.88 - 0.89
		High				1.29	***	1.28 - 1.30
Age at first birth								
		15-19				1.44	***	1.43 - 1.46
		20-24				1.00		
		25-29				0.72	***	0.71 - 0.72
		30+				0.52	***	0.51 - 0.53
Constant			0.009	***	0.008 - 0.009	0.010	***	0.009 - 0.010

Significance level: *** = p-value < 0.01, ** = p-value < 0.05,* = p-value < 0.1

Figure 3: Relative risks of third birth



Model 1 = controlled for cohort and age group
Model 2 = controlled additionally for education and age at first birth

Appendix

Table A1: Relative risks of first birth, with and without weights

Variable		Category	Model 2			Model 2 (using weights)		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Country and Migrant group	United Kingdom	Native	1			1		
		1G Europe & West	0.79	***	0.72 - 0.86	0.75	***	0.68 - 0.82
		1G India	1.16	***	1.04 - 1.29	1.12	**	1.01 - 1.25
		1G Pakistan & Bangladesh	1.94	***	1.79 - 2.10	1.81	***	1.68 - 1.96
		1G Carribean	1.11		0.94 - 1.32	1.13		0.96 - 1.34
		2G Europe & West	0.86	***	0.79 - 0.93	0.85	***	0.78 - 0.92
		2G India	1.05		0.91 - 1.20	0.95		0.83 - 1.09
		2G Pakistan & Bangladesh	1.78	***	1.55 - 2.04	1.44	***	1.26 - 1.65
		2G Carribean	1.07		0.93 - 1.22	0.98		0.85 - 1.12
	France							
		Native	0.95	***	0.93 - 0.97	0.90	***	0.88 - 0.92
		1G Maghreb	1.00		0.96 - 1.04	0.98		0.91 - 1.06
		1G Sub-Saharan Africa	1.17	***	1.12 - 1.23	1.05		0.95 - 1.17
		1G Turkey	1.93	***	1.81 - 2.05	1.73	***	1.51 - 1.98
		1G Southern Europe	0.98		0.90 - 1.06	0.99		0.83 - 1.19
		2G Maghreb	0.94	***	0.90 - 0.98	0.80	***	0.73 - 0.87
		2G Sub-Saharan Africa	1.13	*	1.00 - 1.27	0.89		0.68 - 1.16
		2G Turkey	1.73	***	1.54 - 1.96	1.34	**	1.03 - 1.75
		2G Southern Europe	0.91	***	0.88 - 0.94	0.84	***	0.79 - 0.90
	Germany							
		Native	0.64	***	0.62 - 0.66	0.54	***	0.52 - 0.55
		1G Turkey	1.50	***	1.38 - 1.63	1.25	***	1.15 - 1.35
		2G Turkey	0.92		0.76 - 1.11	0.71	***	0.59 - 0.85
	Belgium							
		Native	0.87	***	0.85 - 0.88	0.91	***	0.89 - 0.93
		1G Italy	1.06	***	1.04 - 1.08	1.15	**	1.03 - 1.29
		1G Morocco	1.08	***	1.05 - 1.10	1.09		0.98 - 1.23
		1G Turkey	1.89	***	1.85 - 1.94	1.93	***	1.69 - 2.20
		2G Italy	0.53	***	0.51 - 0.54	0.48	***	0.40 - 0.57
		2G Morocco	0.81	***	0.78 - 0.84	0.69	***	0.53 - 0.91
		2G Turkey	1.37	***	1.32 - 1.43	1.15		0.83 - 1.60
	Switzerland							
		Native	0.55	***	0.53 - 0.57	0.53	***	0.51 - 0.56
		1G For. Yugoslavia & Turkey	0.87		0.70 - 1.09	0.86		0.70 - 1.08
		1G Western Europe	0.63	***	0.56 - 0.71	0.65	***	0.58 - 0.74
		1G Southern Europe	0.91		0.79 - 1.05	0.95		0.82 - 1.09
		2G For. Yugoslavia & Turkey	0.81		0.55 - 1.18	0.65	**	0.44 - 0.94
		2G Western Europe	0.60	***	0.53 - 0.68	0.58	***	0.51 - 0.66
		2G Southern Europe	0.69	***	0.60 - 0.79	0.64	***	0.56 - 0.74
	Sweden							
		Native	0.94	***	0.93 - 0.96	0.65	***	0.63 - 0.67
		2G Finland	0.89	***	0.87 - 0.91	0.61	***	0.57 - 0.66
		2G For. Yugoslavia	0.83	***	0.80 - 0.86	0.57	***	0.48 - 0.68
		2G Turkey	0.92	***	0.88 - 0.97	0.61	***	0.48 - 0.78
		2G Iran	0.43	***	0.38 - 0.48	0.28	***	0.14 - 0.55
	Spain							
		Native	0.56	***	0.53 - 0.58	0.53	***	0.51 - 0.55
		1G EU, US, Canada	0.57	***	0.54 - 0.61	0.53	***	0.50 - 0.57
		1G Maghreb	0.48	***	0.43 - 0.53	0.44	***	0.39 - 0.49
		1G Latin America	0.60	***	0.55 - 0.66	0.55	***	0.50 - 0.60
		1.5G EU, US, Canada	0.70	***	0.67 - 0.73	0.65	***	0.62 - 0.68
		1.5G Maghreb	0.50	***	0.43 - 0.59	0.46	***	0.39 - 0.55
		1.5G Latin America	0.66	***	0.60 - 0.72	0.62	***	0.57 - 0.68
	Estonia							
		Native	1.35	***	1.30 - 1.39	1.49	***	1.43 - 1.54
		1G Russian Speaker	1.41	***	1.33 - 1.50	1.66	***	1.56 - 1.76
		2G Russian Speaker	1.72	***	1.59 - 1.86	1.83	***	1.69 - 1.98

Significance level: *** = p-value < 0.01, ** = p-value < 0.05,* = p-value < 0.1

Table A2: Relative risks of second birth, with and without weights

Variable		Category	Model 2			Model 2 (using weights)		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Country and Migrant group	United Kingdom	Native	1			1		
		1G Europe & West	0.90	*	0.80 - 1.00	0.92		0.82 - 1.03
		1G India	0.91		0.81 - 1.03	0.96		0.84 - 1.08
		1G Pakistan & Bangladesh	1.45	***	1.33 - 1.58	1.46	***	1.34 - 1.59
		1G Carribean	0.66	***	0.54 - 0.80	0.64	***	0.53 - 0.78
		2G Europe & West	0.89	**	0.81 - 0.98	0.89	**	0.81 - 0.98
		2G India	1.01		0.87 - 1.18	1.08		0.93 - 1.27
		2G Pakistan & Bangladesh	1.55	***	1.32 - 1.81	1.66	***	1.42 - 1.94
		2G Carribean	0.52	***	0.44 - 0.62	0.54	***	0.46 - 0.64
	France							
		Native	0.82	***	0.80 - 0.84	0.78	***	0.76 - 0.80
		1G Maghreb	0.95	**	0.91 - 0.99	0.87	***	0.79 - 0.95
		1G Sub-Saharan Africa	0.89	***	0.84 - 0.94	0.86	**	0.76 - 0.97
		1G Turkey	1.47	***	1.37 - 1.57	1.41	***	1.22 - 1.64
		1G Southern Europe	0.91	*	0.83 - 1.00	0.82	*	0.66 - 1.00
		2G Maghreb	0.91	***	0.87 - 0.96	0.88	**	0.79 - 0.97
		2G Sub-Saharan Africa	0.72	***	0.61 - 0.85	0.72	*	0.49 - 1.05
		2G Turkey	1.02		0.88 - 1.20	1.00		0.71 - 1.42
		2G Southern Europe	0.74	***	0.71 - 0.77	0.70	***	0.64 - 0.75
	Germany							
		Native	0.63	***	0.61 - 0.64	0.61	***	0.60 - 0.63
		1G Turkey	0.95		0.90 - 1.01	0.90	***	0.85 - 0.95
		2G Turkey	0.60	***	0.50 - 0.71	0.57	***	0.48 - 0.68
	Belgium							
		Native	0.74	***	0.72 - 0.75	0.70	***	0.68 - 0.72
		1G Italy	0.91	***	0.89 - 0.94	0.84	***	0.74 - 0.95
		1G Morocco	1.48	***	1.44 - 1.51	1.49	***	1.32 - 1.69
		1G Turkey	1.38	***	1.34 - 1.41	1.41	***	1.22 - 1.62
		2G Italy	0.52	***	0.50 - 0.54	0.53	***	0.40 - 0.70
		2G Morocco	0.79	***	0.76 - 0.83	0.83		0.56 - 1.24
		2G Turkey	0.67	***	0.64 - 0.71	0.70		0.42 - 1.15
	Sweden							
		Native	0.91	***	0.89 - 0.93	0.87	***	0.84 - 0.90
		2G Finland	0.83	***	0.81 - 0.85	0.77	***	0.71 - 0.84
		2G For. Yugoslavia	0.84	***	0.81 - 0.88	0.79	**	0.65 - 0.96
		2G Turkey	0.87	***	0.82 - 0.92	0.83		0.62 - 1.11
		2G Iran	0.89		0.75 - 1.05	0.88		0.33 - 2.34
	Spain							
		Native	0.56	***	0.54 - 0.59	0.54	***	0.51 - 0.56
		1G EU, US, Canada	0.42	***	0.39 - 0.46	0.40	***	0.37 - 0.44
		1G Maghreb	0.71	***	0.64 - 0.80	0.66	***	0.59 - 0.74
		1G Latin America	0.44	***	0.42 - 0.47	0.43	***	0.40 - 0.45
		1.5G EU, US, Canada	0.50	***	0.43 - 0.57	0.47	***	0.41 - 0.53
		1.5G Maghreb	0.79	*	0.61 - 1.03	0.73	**	0.56 - 0.95
		1.5G Latin America	0.46	***	0.37 - 0.58	0.45	***	0.37 - 0.56
	Estonia							
		Native	0.51	***	0.49 - 0.53	0.54	***	0.52 - 0.56
		1G Russian Speaker	0.36	***	0.33 - 0.38	0.37	***	0.34 - 0.40
		2G Russian Speaker	0.27	***	0.25 - 0.31	0.29	***	0.26 - 0.33

Significance level: *** = p-value < 0.01, ** = p-value < 0.05, * = p-value < 0.1

Table A3: Relative risks of third birth, with and without weights

Variable		Category	Model 2			Model 2 (using weights)		
			RR	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Country and	United Kingdom							
Migrant group		Native	1			1		
		1G Europe & West	0.84		0.69 - 1.03	0.88		0.72 - 1.08
		1G India	1.22	**	1.01 - 1.48	1.22	**	1.01 - 1.48
		1G Pakistan & Bangladesh	2.62	***	2.35 - 2.91	2.47	***	2.22 - 2.76
		1G Carribean	1.20		0.90 - 1.60	1.21		0.91 - 1.61
		2G Europe & West	1.24	***	1.07 - 1.43	1.24	***	1.07 - 1.43
		2G India	1.55	***	1.25 - 1.94	1.59	***	1.28 - 1.98
		2G Pakistan & Bangladesh	1.94	***	1.57 - 2.40	1.92	***	1.55 - 2.38
		2G Carribean	1.21		0.95 - 1.54	1.21		0.95 - 1.54
	France							
		Native	0.89	***	0.86 - 0.93	0.87	***	0.83 - 0.91
		1G Maghreb	1.18	***	1.11 - 1.26	1.10		0.96 - 1.26
		1G Sub-Saharan Africa	2.14	***	1.98 - 2.31	2.04	***	1.74 - 2.39
		1G Turkey	2.29	***	2.10 - 2.49	2.06	***	1.72 - 2.48
		1G Southern Europe	0.89		0.76 - 1.03	0.82		0.59 - 1.13
		2G Maghreb	1.52	***	1.41 - 1.64	1.46	***	1.24 - 1.70
		2G Sub-Saharan Africa	1.58	***	1.20 - 2.08	1.55		0.84 - 2.85
		2G Turkey	1.21		0.92 - 1.58	1.15		0.63 - 2.11
		2G Southern Europe	0.67	***	0.63 - 0.72	0.65	***	0.56 - 0.75
	Belgium							
		Native	0.88	***	0.85 - 0.91	0.88	***	0.84 - 0.92
		1G Italy	1.04	**	1.01 - 1.08	0.99		0.82 - 1.20
		1G Morocco	3.08	***	2.97 - 3.20	2.93	***	2.52 - 3.40
		1G Turkey	2.16	***	2.08 - 2.25	1.99	***	1.68 - 2.37
		2G Italy	0.78	***	0.72 - 0.84	0.76		0.38 - 1.50
		2G Morocco	1.53	***	1.41 - 1.66	1.42		0.69 - 2.95
		2G Turkey	0.97		0.87 - 1.09	0.88		0.31 - 2.52
	Estonia							
		Native	0.67	***	0.63 - 0.72	0.71	***	0.66 - 0.76
		1G Russian Speaker	0.25	***	0.21 - 0.30	0.27	***	0.22 - 0.32
		2G Russian Speaker	0.29	***	0.22 - 0.38	0.30	***	0.23 - 0.40

Significance level: *** = p-value < 0.01, ** = p-value < 0.05,* = p-value < 0.1