Migration effects of fertility. The case of Russian migrants in Estonia

Liili Abuladze, Estonian Interuniversity Population Research Centre, Tallinn University
Arieke Rijken, Netherlands Institute for the Study of Crime and Law Enforcement
Leen Rahnu, Estonian Institute for Population Studies, Tallinn University
Leo van Wissen, Netherlands Interdisciplinary Demographic Institute

E-mail: liili@tlu.ee

Paper to be presented at:
XXVII IUSSP International Population Conference
Busan, South Korea
26 August – 31 August 2013
Session 175: Poster Session on International migration (2)

15 August 2013
Draft version – please contact for citation

1. INTRODUCTION

Fertility, especially decreasing fertility, has been a frequently discussed topic in Western or developed countries. Estonia, like other developed countries, has been characterised by low-fertility and ageing trends. Estonian fertility reached below replacement levels already in the 1920s (Katus et al. 2002a). During the past two decades, the period total fertility rate (TFR) made a sharp downturn to 1, 27, although it has recently shown some recovery (1, 64 in 2010, Statistics Estonia). The foreign-origin population in Estonia, the majority of which is of Russian origin, has shown even lower fertility levels than the native Estonian population (Katus et al. 2002b). Since the foreign-origin population comprises about one third of the total population (Statistics Estonia 2011), comparing the native and immigrant population in further detail may provide valuable insight about migration impact on fertility.

Research on migrant fertility has focused primarily on first generation immigrants, usually comparing this population with the native population in the host country (Scott & Stanfors 2010; Coleman 1994; Sobotka 2008; Haug et al. 2002). The data used to analyse this topic has predominately been cross-sectional, as pointed out by Kulu & Milewski (2007), and Andersson (2004). Cross-sectional data analysis represents family events of a person at one single point in time (Blossfeld & Röhwer 2002), and thus neglects the preceding life course that might have influenced the behaviour of the study participants at the time of the study.

The current research aims to contribute to the literature on migrant fertility by analysing long-term development of a migrant population in terms of their fertility behaviour, and by testing the theoretical considerations of migration effects on fertility. This is done by using the Generations and Gender Survey (GGS), which is based on a life course approach and includes several life history modules (Vikat et al. 2007). Furthermore, the study incorporates data on first and second generation Russian immigrants in Estonia as well as the population of their origin country, which provides the opportunity to compare immigrants with the native Estonians and Russians in Russia. The Estonian case allows for an analysis of both first and second generation immigrants that in many Western and Northern European countries is not yet possible, due to the later timing of mass immigration in these countries (e.g. Scott & Stanfors 2010, Andersson 2004, Milewski 2010, Puur et al. 2009a).

The main objective of the present research is to find out whether first and second generation immigrant Russians show convergence with the native Estonian population, or have maintained their origin country behaviour. Thus, the study attempts to view the degree of demographic integration from the fertility perspective. The main research question is as follows: What are the childbearing patterns of first and second generation immigrant Russians in Estonia, in comparison with the native populations of Estonia and their fellows in Russia? More specifically, this research seeks answers to two questions: 1) Are first and second generation immigrant Russians more similar in their fertility behaviour to native Estonians or to native Russians? 2) Are second generation immigrant

Russians more alike to Estonian native population in their fertility behaviour than first generation immigrant Russians?

This study focuses on the timing of first birth and on the time interval from first to second birth. In connection to migration, timing of the first child seems to be one of the crucial points in determining the following fertility behaviour (Katus & Puur 2006). The appearance of the second child is, on one hand, significant in determining the fertility levels of a group as a whole and, on the other hand, helps to understand timing choices at the individual level. The four observation groups include first generation immigrant Russians in Estonia, second generation immigrant Russians in Estonia, Russians in Russia and native Estonians – their patterns of fertility timing are analysed by using piecewise constant exponential models. The sample, operationalization of observation groups and covariates are detailed in the data and methods section.

2. THE HISTORY OF MIGRANT POPULATION IN ESTONIA

Migration processes in Estonia were similar in some respects but different in other respects compared to the rest of Western and Northern European countries' experiences. The main difference comes from the fact that Estonia was incorporated into the Soviet Union after the World War II and thus immigration from former Soviet Union started immediately after the war ended (Sakkeus 1994). Earlier timing of immigration to Estonia makes it an interesting case study since only few Western and Northern European countries have such a large proportion of first and second generation immigrants to test the theory of migration effect on fertility. The more recent influx of immigrants to Western and Northern European countries has also been suggested as one of the reasons for lack of research in this field (Puur et al. 2009a).

In addition to the different timing of immigration, Soviet republics experienced forced migration in the 1940s, mostly in the form of deportations (Puur et al. 2009b). These events partly created favourable grounds for mass immigration, especially for Estonia. Migration policies of the Soviet Union in general were centrally directed from all-union government level, which used highly regulated housing and labour market policies as the main instruments for the execution of migration policies. The Soviet Union was characterized by a planned economy and especially by the preferential development of the industrial sector. Therefore the main focus was on the development of regions within the Soviet Union with either high mineral resources or where existing infrastructure had all the necessary prerequisites for economic activity (like Estonia and Latvia (Kõll & Valge 1998)). Migration policies of the Soviet Union can be regarded as labour force policies that created incentives to move, arranged from a central level. Furthermore, housing was highly regulated, financed and managed by the Soviet state (Buckley et al. 2011, Kährik 2006, Kulu 2003); the role of private market was restricted. In addition to that, migrants (as well as the 'nomenclature') received housing in a facilitating manner - they were favoured due to belonging to the labour force needed for economic development, and because housing was a deficit product (Kährik 2006). Construction and industry workers as well as government employees had especially easy access to new housing (Kährik 2006, Kulu 2003). Usually these labour migrants were granted a place to

live immediately upon arrival (Kulu 2003). When a child was born to a young family, they could queue up to ask for a bigger living place (Katus & Puur 2006). Indirectly, fertility could be affected depending on whether one lived in an urban (where apartments dominate) or rural (bigger houses prevail) environment.

However, similarly to European countries, foreign-origin population of Estonia had relatively distant demographic, cultural and geographical backgrounds, a young age structure, labour market mobility as the main type of migration, employment of foreign-origin population in specific areas and sectors, and low rates of intermarriage with the native population (Puur et al. 2009a). Family-union purposes became relevant in later cohorts (Puur et al. 2009a), similar to countries such as Germany, the Netherlands or Sweden (Milewski 2010, Gaarssen & Nicolaas 2008, Andersson 2004).

During the Soviet Union period, the countries incorporated into this entity remained relatively autonomous, and Estonia in particular had its own political and power structures, similar to an independent country (Liimets 2008). Thus, the migration flows between countries (at least concerning Estonia) within the Soviet Union cannot be regarded as internal migration.

One of the main reasons why these migration flows, in regard to a high proportion (a third of the population) of foreign-origin population, affected Estonia and Latvia so significantly, is the different timing of demographic transitions between receiving and sending countries (Katus et al. 2005). Additionally, Estonia's infrastructure was quite developed in the international context by the time it was incorporated with the Soviet Union (Kõll & Valge 1998), making it a favourable region for the Soviet Union's purposes of the expansive industrial development. Therefore, during the post-war decade, immigration flows were the highest ever recorded in Estonia with a peak of 45000 migrants entering in 1955 (which was about 4% of the total Estonian population in 1955), decreasing only after the mid 1950-s (Sakkeus 1994). Another larger flow of immigration took place at the end of 1960s with a peak of 30000 migrants in 1970 (2,2% of the total Estonian population in 1970), when immigrants originating from more distant parts of eastern and southern Soviet Union entered the country (Sakkeus 1994).

By 1989, the foreign-born population of just the first generation comprised 26% (additional 10% was second generation) of the total Estonian population, thereby making Estonia a country with one of the biggest shares of immigrant population in Europe (Katus et al. 2002a). Concerning the migration after regaining independence in 1991, it has been estimated that about 4% of current foreign-origin population in Estonia arrived after that period (Sakkeus 2007).

With regard to the composition of the immigrant population, they were mostly of Slavic ethnicity (Katus et al. 2002b). By 2000, 80% of the foreign-origin population in Estonia was of Russian origin (Statistics Estonia 2011). The age structure of the foreign-origin population was relatively young compared to the native Estonian population (Katus & Puur 2006) as is common for every migrant group (Rogers et al. 1978). The educational structure shows that those who had remained in Estonia display an equivalent or higher

educational level to that of the native Estonian population (Sakkeus 2007). Despite their educational levels, migrants were often employed in fields that were better paid, but required less qualification (Puur & Sakkeus 1999). This was caused by the Soviet specificity of preferring working class, e.g. wage differences were in favour of industrial and agricultural workers (Klesment & Sakkeus 2010).

3. THEORETICAL BACKGROUND

Research on migrant fertility brings forward different hypotheses which can in broad terms be divided into short- and long-term migration effects, depending on the duration that the migration effect can have. Short-term impacts of migration on fertility have been described by the hypotheses of *disruption, interrelation of events and adaptation* (Andersson 2004, Milewski 2010). This paper will test only long-term hypotheses as the short-term hypotheses require constructing additional time-varying variables which will be done in the next phase of analysis.

Long-term effects of the migration event on fertility have been characterised by the *socialisation* hypothesis which assumes that migrants' fertility behaviour reflects the prevalent behaviour, norms, and values that they have been exposed to during their childhood and adolescence (Andersson 2004, Kulu & Milewski 2007, Milewski 2010). If a first-generation migrant has been mainly influenced by the origin country context, (s)he will exhibit fertility behaviour that is similar to that population. Therefore we distinguish between those first generation migrants who migrated to Estonia in their childhood or teens (or before age 18) and those who migrated as adults (at age 18 or later). The former would have been more exposed to the new host country values, and thus may resemble native Estonians whereas the latter would have been mostly socialised to the Russian society, and thus should resemble their origin country more than the native Estonians. Second-generation migrants are expected to be influenced more by host country norms, values and behaviour, and therefore they might resemble the native population of the host country in their fertility behaviour. Since Estonian migrants often attended Russian-speaking schools and were socialised in a Russian (or Soviet, but Russian-speaking) environment through media, schools, contacts with their origin country and parents' norms and values, it is also possible that due to their low integration with regard to other spheres of society (Integration Monitoring Survey 2011) they actually resemble their parental generations' fertility behaviour.

Selectivity hypothesis captures the effects of migrants' characteristics or migrant population structure on fertility (Andersson 2004, Milewski 2010). Though selective effects are not 'caused' by migration, the theory regards migrants as a specific group of people who are initially differentiated from their origin country population even prior to migrating. Selectivity refers to migrants having different measured or unmeasured attributes (for instance, fertility) that distinguishes them from their population of origin. They could carry characteristics which are more prevalent in the new destination population and therefore have a higher probability of migrating to this destination than the origin country population (Milewski 2010). Alternatively, they could demonstrate even a third type of behaviour, which is distinct from the origin country population. The

characteristics that distinguish migrants from natives (compositional differences) may also leave long-term traces on fertility differentials.

Differences between immigrants and native population of the host country can be attributed to compositional factors, such as age, sex, education, marital status, type of region of origin – urban or rural (Buckley et al. 2011, Milewski 2010). These can explain the advantages in health status (Buckley et al. 2011) or the existence of fertility differentials (Milewski 2010) among certain groups. As suggested by Milewski (2010), the hypotheses of fertility differentials can be tested when compositional differences between the different groups are removed (by controlling for socio-demographic structure).

Hypotheses regarding the first generation immigrant Russians

The reason for low adaptability of first generation immigrants could be the result of different socialising environments (Rahnu 2011). While growing up, first generation immigrant Russians who were exposed to the values, norms and behaviour of their origin country environment would resemble Russians in Russia. Those who were more exposed to the host country's values and norms, would resemble the native Estonians more. Thus the first long-term effect hypothesis is as follows *(H1): it is expected that the first generation immigrant Russians who migrated to Estonia as adults resemble their origin country population more than the native Estonians in terms of their fertility behaviour.*

(H2): it is expected that the one and a half generation immigrant Russians resemble native Estonians more than Russians in Russia in terms of their fertility behaviour.

Since the migrants in Estonia have been different from that of the native population of Estonia as well as their counterparts in Russia, i.e. mainly young people entered Estonia at the time of migration (but also due to other measured or unmeasured characteristics), it is expected that age and other related structural differences (such as educational attainment, type of region of origin, experience and age of migration) cause different fertility outcomes for the observed groups. As a way of diminishing structural effects, we have included only urban population to the analysis and those migrants who have had their first child after migrating to Estonia. In addition, main characteristics will be controlled for.

Hypothesis regarding the second generation immigrant Russians

As for the second generation immigrant Russians, since they have been born in Estonia it is assumed that the main socialisation of this group has taken place in the environment of their residence country, compared to the first generation migrants. Therefore the hypothesis for the second generation based on the socialisation theory is as follows *(H3): the second generation immigrant Russians' fertility behaviour resembles native Estonians more than the first generation immigrant Russians do.*

4. DATA AND METHODS

4.1 Data and sample

The data used for analysis are retrospective micro-data collected within the framework of the Generations and Gender Programme (GGP) in both Estonia and Russia (wave 1) during 2004 and 2005. GGP focused on family and fertility changes by examining several cohorts and each individual's life course from various aspects such as marital history, childbirth, labour force experiences, educational and migration history, health etc. Vikat et al. (2007) give a more detailed overview of the methodological concept behind this survey framework. The Estonian survey followed the event-history approach meticulously since the cohort perspective would be an important addition to existing cross-sectional data on the population, often influenced by unstable periods of data collection. Also, such a perspective was seen as a way of combining micro (the individual) and macro level (population and society) approaches (Katus et al. 2008, Tuma & Hannan 1984). Different birth cohorts show different levels of completeness of life careers, therefore it is only natural that some of the events or processes cannot be seen yet fully from the data of younger cohorts (Katus et al. 2008).

The Estonian GGS survey interviewed 7855 individuals. The Estonian response rate was 70,2%, with a slightly higher rate for women. The Russian GGS first wave included 11261 individuals. The Russian total response rate for that wave was one of the lowest among the GGS participating countries with the level of 44,1%. In the case of Russia, attrition was biggest in larger cities and urban areas – for example the response rate for Moscow and St.Petersburg was only 14,4%, thus potentially being more biased towards the rural and smaller urban area population. In addition, men and respondents born in the 1920-s as well as 1980s had the highest attrition rates (Sinyavskaya 2012). Low response rates in the Russian major urban settlements of St. Petersburg and Moscow may remarkably influence results. Therefore we conducted analyses with and without including these two cities as a way to test the non-response bias – following the example of Kesseli (2007). The results did not differ much, but this paper will only show results without St.Petersburg and Moscow.

Despite the event-history nature of the survey, in some cases the harmonised Russian data file had some missing information which made the analysis more complicated. For example, there was no response or information available for the type of child (biological or not) in over 1500 cases. In cases when the recorded children had no response on the type, it was assumed that all were biological – thus their information (e.g. date of birth) was used and these cases could be included in the analysis. This increased the proportion of Russians with one child from 67% to 80% and with two children from 3% to 36%. In cases where some of the children of the respondent were marked as biological whereas some other children of the same respondent had no response on the type, it was assumed that only those marked as 'biological children' were actually biological, so only those marked so were included in the analysis. Therefore it is probable that the share of biological children is underestimated in this dataset, also when considering that data from two major cities is underreported.

Although the surveys themselves have focused more on women than men (by having larger samples of women), which coincides with the classical view of how to tally births in a population, our analyses include both male and female respondents. Thus gender is included as one of the main demographic control variables. All respondents born between 1924 and 1983 and who have reported urban settlement as their current type of settlement at the time of the interview are the focus of this study. The latter was done to diminish possible structural differences because over 95% of immigrant population in Estonia has settled or lives in urban areas. In addition, this has been suggested by Milewski (2010) as one of the ways to adjust for fertility differentials. Furthermore, socialisation takes into account the impact of the surrounding environment, and it has been established that fertility is generally higher in rural areas.

The definitions of native and foreign-origin populations in this study were not based on the legal definition of citizenship which has been indicated to be insufficient (Haug 2000), but rather on the place of birth of migrants, their parents and grandparents. An individual is considered as belonging to the native population of Estonia when at least one of the parents or at least one of the grandparents was born in Estonia - thus also including those who might have been born abroad, but have migrated back to Estonia at some point in their life. Also descendants of mixed marriages are considered as native Estonians. The immigrant group under observation in this study includes only Russians, since most of the immigrants in Estonia are of Slavic origin, especially of Russian origin. By limiting the immigrant group to people of Russian origin, structural effects which might originate from cultural heritage (Rahnu 2011) are diminished. Another reason for only including Russian immigrants is the availability of comparable data in Russia. First-generation immigrant Russians were defined as people who were not born in Estonia and have a Russian ethnic affiliation (self-reported ethnicity). In addition, first generation immigrants migrating to Estonia before age 18 (or 1,5 generation) were separated from those migrating after age 18 for better estimation of the socialisation hypothesis. Second generation immigrant Russians were defined as people who have no parents and grandparents born in Estonia, but who themselves have been born in Estonia after 1945, and have a Russian ethnic affiliation. In addition, Russians in Russia are included according to self-reported ethnic affiliation as a fourth observation group to enable comparison with the immigrants' origin country demographic behaviour. These groups were combined from two datasets: the Russian GGS first wave and the Estonian GGS dataset.

Additionally, the first generation immigrant Russians (including 1,5 generation) were selected to include only those respondents who have conceived their first child after migration in order to be able to test the effect of migration on fertility. First generation immigrant Russians who had their first birth before migrating to Estonia have not been included in the analysis (24% of them were omitted from analysis due to this reason). In addition, first generation migrants who migrated between their first and second birth have not been included in the analysis in order to test more fully for socialisation effect. Furthermore, there is no distinction made between migrants moving to Estonia before 1991 and after 1991 (when Estonia regained independence) since the share of migrants moving after 1991 is very small – only four percent (Sakkeus 2007).

In total, after manipulations with data based on region of living (including only urban, but taking into account both men and women) the sample size is 9965 cases, consisting of 324 1,5 generation immigrant Russians, 448 first generation immigrant Russians who migrated as adults, 689 second generation immigrant Russians, 3361 native Estonian population representatives, and 5143 Russians in Russia. Table 1 shows the main sample characteristics for the sample used in the analysis.

4.2 Variables

This study focuses on the timing of first child conception and on the time interval between first and second birth. The dependent variable for the timing of first birth is age of the respondent at conception of first child. This was calculated by subtracting nine months from the age at first birth, in order to be able to distinguish those who have conceived their child after migration from those who conceived their child before migration (the latter were not included in the analyses) to be able to test the effect of migration on fertility. Respondents were at risk of first birth from age 15 until the event occurred or until the interview took place. If respondents had not experienced birth by the time of interview, they were censored at their age, or if they were older than 45 at that time, they were censored at age 45. Respondents having their first child after age 45 were censored at age 45. If the respondent had twins as first children, they were taken into account under first birth and only once.

The dependent variable for the timing of second birth is the time interval in months between first and second birth (also subtracting nine months). Respondents were at risk of second birth from the moment of first birth until the event occurred or until the interview took place. Therefore only those experiencing first birth were included in the analysis of the timing of second birth. Censoring in this analysis was done in the same way as in the analysis of first birth.

The main independent variable indicates the ***group identification,*** distinguishing between the 1,5 generation immigrant Russians, the first generation Russian immigrants (migrating to Estonia after age 18), the second generation Russian immigrants, Russians in Russia and native Estonians (see 4.1 for description of the groups).

Birth cohort distinguishes between 10-year birth cohorts, starting with the 1924-1933 cohort and ending with the 1974-1983 cohort. This variable controls for the impact of different cohorts on the timing of births and is used as a control for differences in age structure between the four observation groups. For both first and second birth timing, interaction effects between the group identification and cohort variables were included to disentangle cohort and period effects on fertility among the observation groups.

Educational attainment is a time-varying variable which controls for the association between education and fertility and avoids anticipatory analysis (Hoem & Kreyenfeld 2006). However, the harmonised data files included only the highest attained education level (according to ISCED 1997 categorisation) by the time of the interview or indicated whether the respondent was still in school at that time. This information was used to

construct a time-varying education variable by splitting educational status into different episodes according to respondents' approximate educational status at each of these episodes. The construction of education histories was based on the assumption that basic education in the Estonian and Russian education systems were attained by age 15 at the latest, medium or (post)secondary (non-tertiary) education were attained by age 18 and higher or tertiary education attained by age 23. Also, a separate value was created for the episodes when one was in school, thus making the education variable a time-varying one. There are limitations to using such a broad categorisation. However, this reconstruction should be sufficient to compensate for the anticipatory effect of education. In some cases the values could not be determined, due to missing information on education variables. However, these were entered into the analysis into the 'unknown' category in order to include as many cases in the analysis as possible.

Although only urban population is included, the type of region of origin can influence the behaviour in adulthood as well, as a result of socialisation. Therefore the ***type of region of origin*** has been added as one of the control variables, indicating whether originating from rural or urban background has an impact on timing of births within each observation group. Unfortunately the type of origin settlement could not be withdrawn from the Russian file in a similar detailed way as from the Estonian file. Therefore the urban-rural origin division is only a general adjustment. For Estonians and immigrants in Estonia, the construction of the variable was based on where the person had spent most of their childhood (until age 14 if they had moved from their place of birth in the meantime), whereas for Russian respondents, this variable was available only based on their place of birth. As there were several missing cases or more specifically, missing labels for some of the regions in the Russian file, these cases were coded into a separate 'unknown' category under the region of origin variable and were also included in the analysis.

Partner's country of birth controls for the partner's origin because this may affect the fertility decisions and behaviour. Three categories distinguish partners born in the same country, partners born abroad and respondents who do not have a partner or for whom information on partner's country of birth was not available. However, this reflects only the current partner's country of birth. In the next phase of analysis a time-varying variable should be included with the information about the partner at the time of the births.

In the analysis of second birth timing, a control variable of the ***age at first birth*** was included with the following categories: 15-24, 25-34, 35-45 years and other.

4.3. Method of analysis

As we investigated differentials in timing of childbearing and had retrospective data we used an appropriate event-history analysis method. A piecewise constant exponential model was chosen to analyse different fertility timings. As childbearing is a time-dependent process, this method can handle time-varying variables as well as censored cases in the most flexible, yet detailed way. Since timing of two processes is the main focus of this study, a certain baseline hazard can be assumed with piecewise constant

exponential model (Blossfeld et al. 2007). As fertility usually has a relatively clear age-specific pattern and is within the margins of reproductive age, it would be important to know how this pattern varies between different groups. By specifying sub-episodes of the process under observation, a piecewise model gives a more accurate estimation of birth timing risks than compared to Cox regression, for example, which does not assume any shape of baseline hazard. In this analysis, the sub-episodes of timing of first and second birth were split into two-year periods. To better check the fulfilment of the proportionality assumption, interactions between the group identification and baseline (duration until first or second birth) variables were also included.

5. RESULTS
5.1. Descriptive results

As the timing of birth is an age-specific process, the descriptive results aim to establish the general age structural proportions of the observation groups. Table 1 indicates that the first generation immigrant Russians and the 1,5 generation immigrant Russians in the GGS sample have the oldest age structure as more of them belong to the older cohorts than the rest of the groups, leaving relatively small share of the first generation to the youngest cohort (4.7%). The share of second generation immigrant Russians only grows with younger cohorts.

The different age structures of the observation groups is also reflected by the mean ages of the observation groups: the second generation immigrant Russians are youngest with an average age of 37 years while the first generation is oldest. 1,5 generation migrants have ten years lower mean age at interview compared to the first generation migrants who moved to Estonia as adults – 50.6 and 60.8, respectively. These differences reflect the age-specific nature of migrating at younger ages, but when this inflow suddenly stopped in the 1990s, ageing of the foreign-origin population accelerated and contributed to the ageing of the whole population. Also, there are more first generation immigrant Russians from older cohorts (hence their older mean age) than among the 1,5 generation who are also represented in the younger birth cohorts. Native Estonians and Russians in Russia hold a middle position with both having 47 years as the average age of the group.

The 1,5 generation as well as the first generation have the largest proportions of those who have had a first child (85.5% and 89.3%, respectively), reflecting their older age structure and that more of them had finished their childbearing careers by the time of interview. Russians in Russia follow with 80.9%. The second generation immigrant Russians have the lowest proportion of those having had a first child (68.8%) as they have the youngest age structure.

1,5 generation and first generation migrants show the highest proportion of having had a second child (53.4% and 57.8%, respectively), followed by native Estonians (50.3%). 36% of Russians in Russia have had a second child which is comparable to the 33,4% of the second generation immigrant Russians' proportion. For the latter group, their younger age structure is the main reason for low shares of people with two children. It is possible that due to missing information on the type of children in the Russian dataset, the number and share of biological first and second children for Russians is underestimated in our sample.

Regarding the average ages at first birth (without subtracting nine months), some of the differences between the groups stand out. The second generation immigrant Russians have the lowest average age at first birth: they are on average 23.5 years old when this event occurs. This reflects their unfinished childbearing careers by the time of interview. However, the 1,5 generation migrants follow with 23.8 years. The native Estonians have an average age at first birth of 24.9, for Russians in Russia it is 24.4 and for the first

generation migrants who moved as adults it is the highest at 25.9 years. Age structure differences are also reflected in the differences of age at second birth.

Table 1. Sample characteristics by observation groups (in %, if not stated otherwise)

	2nd	Native	Russians	1,5	1st
	N=689	N=3361	N=5143	N=324	N=448
First birth occurred	68,8	76,6	80,9	85,5	89,3
Second birth occurred	33,4	50,3	36,0	53,4	57,8
Female	58,2	66,2	62,2	70,1	67,9
Mean age at interview (in years)	37,0	47,4	47,7	50,6	60,8
Mean age at first birth (in years)	23,5	24,9	24,4	23,8	25,9
Mean age at second birth (in years)	28,0	28,5	28,6	28,7	30,0
Birth cohort					
1924-1933	0	11,7	10,8	5,9	23,4
1934-1943	0	14,4	15,4	21,0	28,4
1944-1953	14,8	15,0	16,7	25,6	21,9
1954-1963	20,5	16,2	20,1	21,6	21,7
1964-1973	27,9	19,6	17,5	14,8	4,7
1974-1983	36,9	23,0	19,5	11,1	0
Educational level					
Low (ISCED 0-2)	10,0	18,1	14,2	15,7	27,2
Medium (ISCED 3)	73,1	64,6	63,4	64,8	52,9
ISCED 4	16,4	15,3	16,8	17,9	19,6
High (ISCED 5-6)	0,4	2,0	0,4	1,5	0,2
Unknown	0	0	5,2	0	0
Currently in education	9,7	9,6	6,1	3,4	0
Partner's country of birth					
Born in the same country	43,3	58,1	61,4	26,5	20,5
Born abroad	20,2	6,1	5,8	37,7	41,5
No partner or n/a	36,6	35,8	32,7	35,8	38,0
Type of region of origin					
Rural	2,8	39,1	36,5	21,0	57,5
Urban	97,2	60,9	55,3	79,0	42,5
Unknown	0	0	8,2	0	0
Age at migration					
Migration before 18	0	3,3	0	100	0
Migration at or after 18	0	1,8	0	0	100
No migration	100	94,9	100	0	0
Age at first birth					
15-24	53,6	49,5	56,3	64,2	49,5
25-34	13,8	25,0	22,3	20,4	36,2
34-45	1,3	2,1	2,1	0,9	3,6
Other age or no birth	31,3	23,4	19,3	4,5	2,4

The highest attained education level at the time of the interview shows a higher share of those with post-secondary, but non-tertiary education (ISCED 4) among the foreign-origin population as well as Russians in Russia, with 17.9% of the 1,5 generation and 19.6% of the first generation immigrant Russians holding this level. 2% of native Estonians and 1.5% of the 1,5 generation migrants have attained a tertiary education while these proportions remain below 1% for other groups. Second generation immigrant Russians and native Estonians have the highest shares of those enrolled in education at the time of interview (9.7% and 9.6%, respectively) while it is lowest among the first generation immigrants (1.4%). Again, the age structure of the observation groups plays a role here.

Partner's origin may have an important impact in fertility decisions. All foreign-origin groups show a higher share of those with a foreign-born partner. The first generation migrants have the largest share of foreign-born partners (41.5%) compared to the 1,5 generation migrants (37.7%) and second generation migrants (20.2%). Below 10% of the native Estonians and Russians in Russia have foreign-born partners.

Regarding the type of origin settlement, second generation immigrant Russians originate predominantly from urban areas (97.2%) which corresponds to their parents' choice of living after migrating. The 1,5 generation immigrant Russians also show higher proportion of those originating from urban areas (79%) while over half of the first generation (57.5%) originates from rural regions. 55.3% of Russians in Russia come from urban areas, but this proportion is below that of native Estonians (60%), corresponding to the different timing of the demographic and mobility transition stages. It is important to note that 8.2% of the cases in the Russian file did not have enough information on the region of origin and are thus classified as 'unknown'. In case this information was available and if respondents from St.Peterburg and Moscow were included in the analysis, the share of Russians originating from urban areas migth be larger.

Age at migration concerns mostly the first generation and 1,5 generation immigrant Russians of whom 42% have migrated before age 18, thus in their childhood and with their parents. These are referred to as the '1,5 generation' migrants in this paper. The rest – 58% - have migrated in their adulthood – they are referred to as the 'first generation' in this paper. Some people among the natives have experienced migration as well, though over 95% of them have been born in Estonia.

5.2. First birth timing

Table 2 presents the hazard ratio estimates for the timing of first conception based on piecewise constant exponential models. Model 1 includes the main effects of all independent variables and shows that 1,5 generation immigrant Russians are the most likely to have a first child than other observation groups. The likelihood is almost 20% and significantly higher than for native Estonians, but it is even 26% higher compared to the first generation migrants to have a first child. This indicates that the first generation immigrant Russians and the 1,5 generation are two distinct groups.

To understand if and how the differences in the timing of first birth depend on cohorts, interactions between the group identification and cohort variables were included in Model 2. Where no observations were observed for cohort and group interactions (e.g. second generation born in 1924-1933, or first generation born in 1974-1983), these rows are not shown in the table. The 1,5 generation immigrant Russians born in 1924-1933 were set as the reference category for interactions. Therefore all other interaction effects represent relative risks compared to the reference group. The results of Model 2 are also illustrated on Figure 1.

The 1,5 generation migrants have the highest likelihood of first birth throughout most of the cohorts compared to other groups whereas the first generation migrants have one of the lowest first birth risks (except for those born in 1964-1973). 1,5 generation migrants born in 1934-1943 are closest to Russians in Russia, but these two groups diverge for those born in 1954-1963, and then converge again from the 1964-1973cohorts onwards. The 1,5 generation migrants follow a similar trend line to that of native Estonians among those born in 1924-1953. The birth cohorts of 1954-1963 become different from the native Estonians and have the lowest birth risk compared to other groups of that cohort. Russians in Russia born in 1954-1963 and 1964-1973 stand closest to the 1,5 generation migrants of the same cohorts.

Socialisation seems to work in opposite directions for the first and the 1,5 generation migrants because older cohorts of the 1,5 generation resemble Russians in Russia rather than native Estonians. However, being more similar to the native Estonians starting from the 1944-1953 cohort shows that the 1,5 generation may have socialised into the Estonian society only from these cohorts onwards. Therefore the second hypothesis is confirmed only for the 1,5 generation immigrant Russians born in 1944-1953 or later. The first generation immigrant Russians who moved to Estonia after age 18, resemble native Estonians among the older cohorts, but this reverses after the 1944-1953 cohorts when the first generation starts to resemble Russians in Russia in their first birth risks. Therefore the first hypothesis is confirmed only for the first generation immigrant Russians born in 1924-1943. It might be that instead of socialisation to the Estonian society, the older cohorts of the first generation immigrant Russians were already selective from Russians in Russians in terms of being more alike to native Estonians before or during their move. If we assume that these cohorts also arrived to Estonia earlier in terms of historical time than other cohorts of the same observation group or the 1,5 generation immigrant Russians, their flows would correspond to the migrants who came from closer regions to Estonia than compared to later periods (Sakkeus 1994).

These populations may therefore have been closer in their demographic behaviour to native Estonians.

Table 2. Piecewise constant exponential models for timing of first conception

	Mdel 1*			Model 2**		
	Hazard Ratio	**S.E.**	**Sig**	**Hazard Ratio**	**S.E.**	**Sig**
Observation group (ref: 1,5 generation)						
First generation	0,740	0,0585	0,000			
Second generation	0,903	0,0692	0,182			
Russians in Russia	0,906	0,0579	0,122			
Native Estonians	0,801	0,0519	0,001			
Birth cohort*observation group (ref:1924-1944*1,5 generation)						
1934-1943*1,5 generation				0,980	0,2682	0,942
1944-1953*1,5 generation				0,923	0,2490	0,765
1954-1963*1,5 generation				1,210	0,3311	0,487
1964-1973*1,5 generation				0,913	0,2656	0,754
1974-1983*1,5 generation				0,654	0,2250	0,217
1924-1933*First generation				0,638	0,1692	0,090
1934-1943*First generation				0,662	0,1725	0,113
1944-1953*First generation				0,803	0,2129	0,407
1954-1963*First generation				0,718	0,1910	0,213
1964-1973*First generation				1,061	0,3513	0,859
1974-1983*First generation						
1944-1953*Second generation				0,991	0,2625	0,972
1954-1963*Second generation				1,079	0,2798	0,769
1964-1973*Second generation				0,921	0,2370	0,750
1974-1983*Second generation				0,491	0,1305	0,007
1924-1933*Russians in Russia				0,779	0,1925	0,312
1934-1943*Russians in Russia				0,894	0,2201	0,650
1944-1953*Russians in Russia				0,861	0,2122	0,544
1954-1963*Russians in Russia				0,862	0,2122	0,546
1964-1973*Russians in Russia				0,994	0,2455	0,981
1974-1983*Russians in Russia				0,658	0,1637	0,093
1924-1933*Native Estonians				0,635	0,1580	0,068
1934-1943*Native Estonians				0,712	0,1765	0,170
1944-1953*Native Estonians				0,877	0,2173	0,596
1954-1963*Native Estonians				0,964	0,2390	0,881
1964-1973*Native Estonians				0,815	0,2019	0,408
1974-1983*Native Estonians				0,458	0,1148	0,002

* Model 1 controls for time until first birth since age 15, gender, birth cohort, time-varying education level, current partner's birth country, type of region of origin

** Model 2 controls for gender, birth cohort, time-varying education level, current partner's birth country, type of region of origin

The second generation immigrant Russians born in 1944-1953 and 1953-1963 are most similar to the 1,5 generation (for 1944-1953, 1954-1963 and 1964-1973 cohorts), and they also follow a similar trend line to that of native Estonians throughout all cohorts. When the second generation immigrant Russians were set as reference group (tables not shown here, available on request), they remained in-between the 1,5 generation and native Estonians. In the cohorts of 1964-1973 the 1,5 generation and second generation migrants became identical. Similarly to the 1,5 generation immigrant Russians born in 1944-1953 or later, we find support to the third hypothesis regarding the socialisation effect of the host country for the second generation immigrant Russians – they resemble more native Estonians than Russians in Russia in terms of first birth risks.

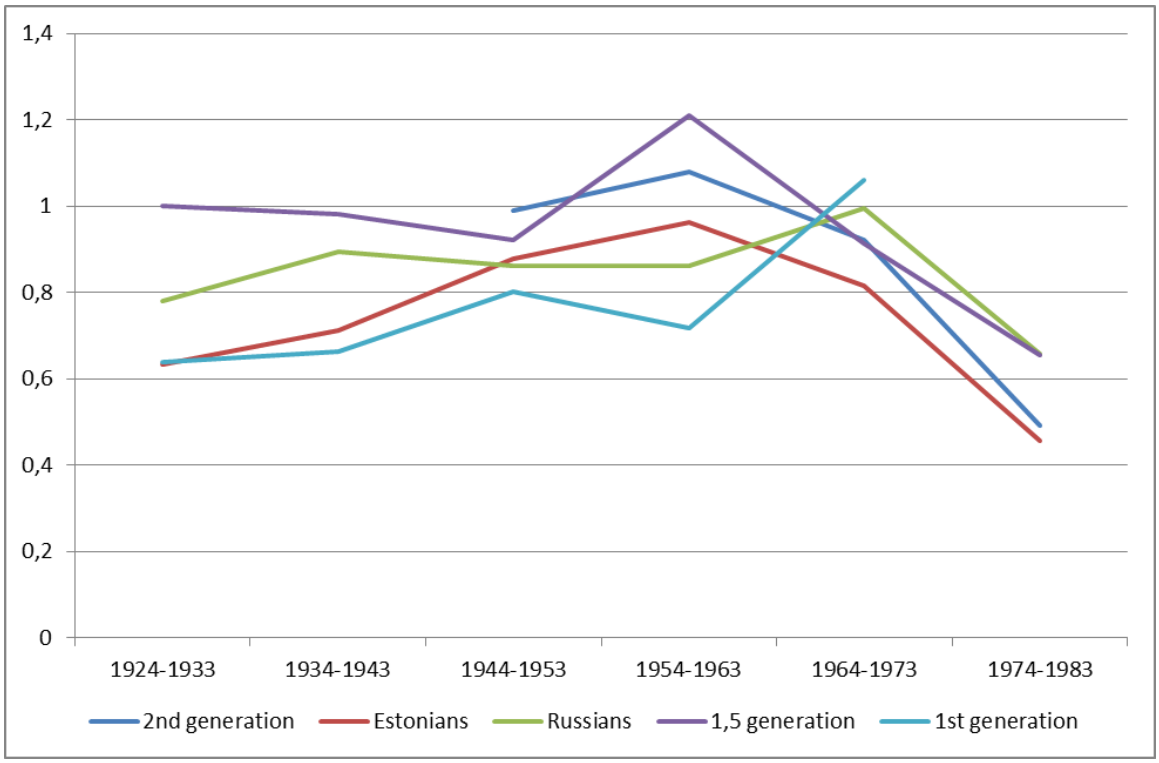


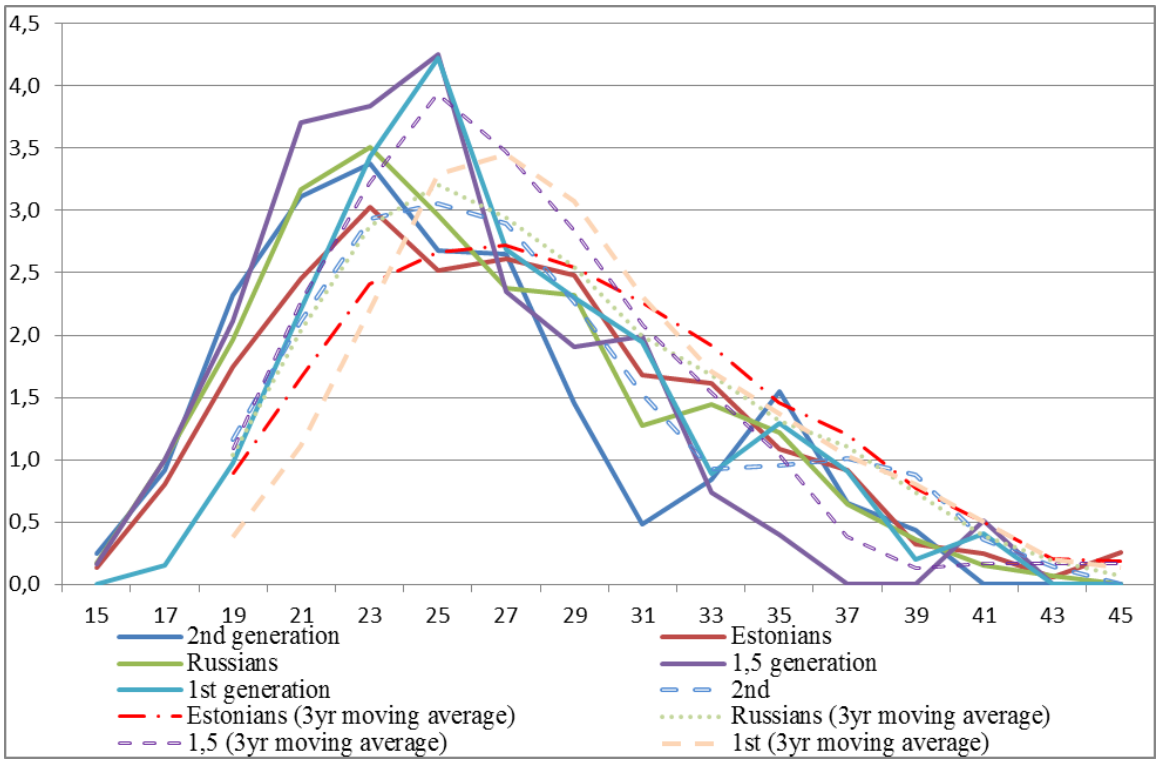
Figure 1. Timing of first conception by observation group and birth cohort, relative risks

For an even more detailed look, a separate piecewise constant exponential model (Model 3) was run with interactions between the baseline (or the duration variable of the timing of first birth in months, since age 15) and the group identification variables. Results are shown on Figure 2 (table available on request). The reference group was set for first generation immigrants having their child two years after age 15 (or at age 17).

The figure indicates risks of timing of first birth at certain age points since age 15. 1,5 generation immigrant Russians start their childbearing at earliest age together with the second generation immigrant Russians and Russians in Russia. The age at first birth for the 1,5 generation peaks at age 25 while it is at age 23 for the Russians in Russia and the second generation.

The first generation immigrant Russians who migrated after age 18 start their childbearing at the latest ages, but their age at first birth peaks also at age 25 similarly to the 1,5 generation. It should be kept in mind that only these first generation (and 1,5 generation) migrants who had their birth after migration are included in this analysis which shifts the starting time of having children to later ages for these groups. Otherwise, the age at first birth for the first generation migrants (and 1,5 generation) might resemble more that of native Estonians.

In terms of timing of first birth, the 1,5 generation resembles Russians in Russia more than native Estonians as the 1,5 generation starts their childbearing at a similar age as their origin country population. The first generation immigrant Russians start their childbearing careers the latest, but this does not suggest that they resemble native Estonians in that. The first generation does not have a similar postponement of fertility to later ages as the native Estonians do. This suggests that the first generation has not socialised to their origin country population nor to Estonia, but instead carries a third, distinctive fertility pattern. It may be related to their migration experience which has occurred during the most active childbearing ages and has postponed the start of childbearing to later ages. We cannot assess yet whether this is due to different norms and values regarding childbearing compared to Russians in Russia or due to some unmeasured characteristics.



Figue 2. Relative risks for timing of first conception at different ages since age 15

The second generation immigrant Russians resemble Russians in Russia the most in terms of the timing of first birth (this was controlled also with the second generation

immigrant Russians as reference group). The only difference from Russians in Russia is that their risk of having their first child decreases sharply after age 27 which is because of their younger age structure.

The native Estonians have the highest likelihood of having their first child between ages 31-35 compared to other groups, thus postponement of fertility and having children also at later ages is more spread among the native Estonians. This confirms the different demographic transition timing between the Estonians and Russians.

The second generation immigrant Russians were similar to native Estonians in terms of risk of first birth, but based on the timing of first birth, they have socialised more towards Russians in Russia. Since the second generation immigrant Russians are more distinct from the 1,5 generation and the first generation immigrant Russians in their timing of first birth, it is possible that the socialisation to the Russian-speaking context through media and schools has had a stronger effect for them becoming more alike to Russians than for the first generation and 1,5 generation migrants.

5.2. Second birth timing

Table 3 shows the results of piecewise constant exponential models for main and interaction effects of the risks of second birth. The main effects model (1) shows that the 1,5 generation immigrant Russians (reference group) have the lowest second birth risk while the second generation immigrant Russians have 34% higher chances of having a second child than the 1,5 generation. However, none of the groups are significantly different from the reference group.

The interaction effects between the cohort and observation group variables (Model 2) indicate that the 1,5 generation born in 1924-1953 have the lowest chances of having a second child while this risk increases for those born in 1954-1963 and 1974-1983. The first generation immigrant Russians and Russians in Russia born in 1924-1933 have the highest risk of second birth compared to other groups, and they are similar to each other throughout the cohorts. Russians in Russia born in 1974-1983 have a somewhat higher risk of second birth than previous cohorts of the same observation group, but it is the lowest compared to other observation groups of the same birth cohort.

Similarly to the risk of first birth, it seems that the 1,5 generation immigrant Russians' socialisation to the Estonian society has started from younger cohorts, in case of second birth risks starting from those born in 1954-1963. However, the cohort of 1964-1973 seems to be similar to Russians in Russia. Though the change for the 1,5 generation can be seen already in older cohorts, they resemble more Russians in Russia than native Estonians before the 1954-1963 birth cohort. Thus there is no clear indication of socialisation of the 1,5 generation immigrant Russians to the Estonian society regarding second birth risks.

Table 3. Piecewise constant exponential models of timing of second birth, ref: 1st generation

	Model 1*			Model 2**		
	Hazard Ratio	**S.E.**	**Sig**	**Hazard Ratio**	**S.E.**	**Sig**
Observation group (ref: 1,5 generation)						
First generation	1,123	0,1137	0,253			
Second generation	1,134	0,1191	0,290			
Russians in Russia	1,046	0,0894	0,601			
Native Estonians	1,278	0,1091	0,004			
Birth cohort*observation group (ref:1924-1944*1,5 generation)						
1934-1943*1,5 generation				1,036	0,3519	0,917
1944-1953*1,5 generation				1,192	0,3811	0,583
1954-1963*1,5 generation				1,752	0,5873	0,094
1964-1973*1,5 generation				1,168	0,4191	0,666
1974-1983*1,5 generation				3,454	1,8444	0,020
1924-1933*First generation				1,574	0,4975	0,151
1934-1943*First generation				1,316	0,4139	0,382
1944-1953*First generation				1,372	0,4357	0,320
1954-1963*First generation				1,463	0,4688	0,235
1964-1973*First generation				1,097	0,4713	0,830
1974-1983*First generation						
1944-1953*Second generation				1,210	0,3874	0,551
1954-1963*Second generation				2,000	0,6267	0,027
1964-1973*Second generation				1,212	0,3844	0,544
1974-1983*Second generation				2,710	1,0166	0,008
1924-1933*Russians in Russia				1,430	0,4247	0,228
1934-1943*Russians in Russia				1,216	0,3600	0,509
1944-1953*Russians in Russia				1,227	0,3636	0,489
1954-1963*Russians in Russia				1,445	0,4277	0,214
1964-1973*Russians in Russia				1,355	0,4043	0,309
1974-1983*Russians in Russia				1,785	0,5754	0,072
1924-1933*Native Estonians				1,385	0,4131	0,275
1934-1943*Native Estonians				1,471	0,4368	0,193
1944-1953*Native Estonians				1,685	0,5004	0,079
1954-1963*Native Estonians				1,909	0,5662	0,029
1964-1973*Native Estonians				1,560	0,4634	0,134
1974-1983*Native Estonians				2,389	0,7408	0,005

* Model 1 controls for time between first and second birth, gender, birth cohort, time-varying education level, current partner's birth country, type of region of origin, age at first birth

** Model 2 controls for gender, birth cohort, time-varying education level, current partner's birth country, type of region of origin, age at first birth

Native Estonians show one of the highest second birth risks, especially among those born in 1934-1953 and 1964-1973. Russians in Russia and first generation immigrant Russians have a higher birth risk among those born in 1924-1933 than native Estonians of the same cohort which reflects the different timing of the (start of the) second demographic transition of these groups. The first generation immigrant Russians resemble Russians in Russia regarding the second birth risks throughout all cohorts.

The second generation immigrant Russians are similar to Russians in Russia and to 1,5 generation immigrant Russians among those born in 1944-1953 and 1964-1973. The second generation immigrant Russians born in 1954-1963 have the highest second birth risk compared to other groups and resembles native Estonians in that, however, a clear socialisation of this group to the Estonian society cannot be observed. It might be that the younger cohorts of the second generation immigrant Russians converge with native Estonians in terms of second birth risks, but further data on completed fertility would be needed to conclude this.

Due to underreporting of the type of child, the risks of second birth of Russians in Russia may be are underestimated, and therefore conclusions regarding the Russians in Russia should be taken with caution. The results of model 2 are also illustrated on Figure 3.

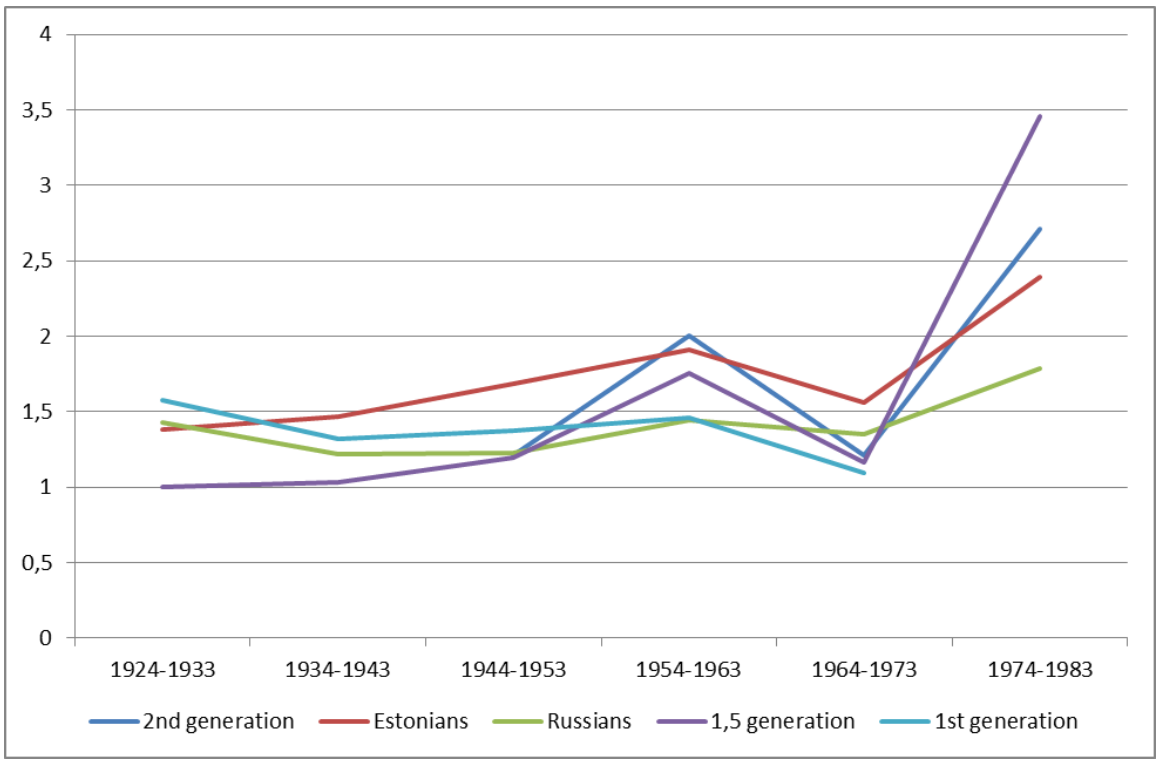


Figure 3. Timing of second birth by observation group and birth cohort, relative risks

A more detailed look at the interactions between the baseline hazard (the duration variable from first to second birth) and the group identification is illustrated on Figure 4. These results indicate that native Estonians are most likely to have their second child

shortly after the first one - within two years. Thus native Estonians start relatively late with their childbearing (not considering the special case of first generation immigrant Russians), but then tend to have their children in a short time span – their childbearing is concentrated into a certain life period only. The trend line stabilises for native Estonians after two years and is one of the lowest for later time points. The second generation immigrant Russians follow native Estonians in that they too have a higher likelihood of having their second child within four years since having the first one.

For other groups the interval between two births spans over a longer period, with the first generation immigrant Russians who migrated as adults having the highest likelihood of having their second child six to ten years after the first one. The first generation resemble Russians in Russia in their likelihoods at most of the time points. Thus, even though the migration experience seemed to indicate that the first generation immigrants start having their children at the latest ages, they do not hurry with having the second one. The 1,5 generation immigrant Russians resemble Russians in Russia too, except for the later time points the 1,5 generation starts to resemble also native Estonians, thus indicating to potential socialisation regarding postponement of births.

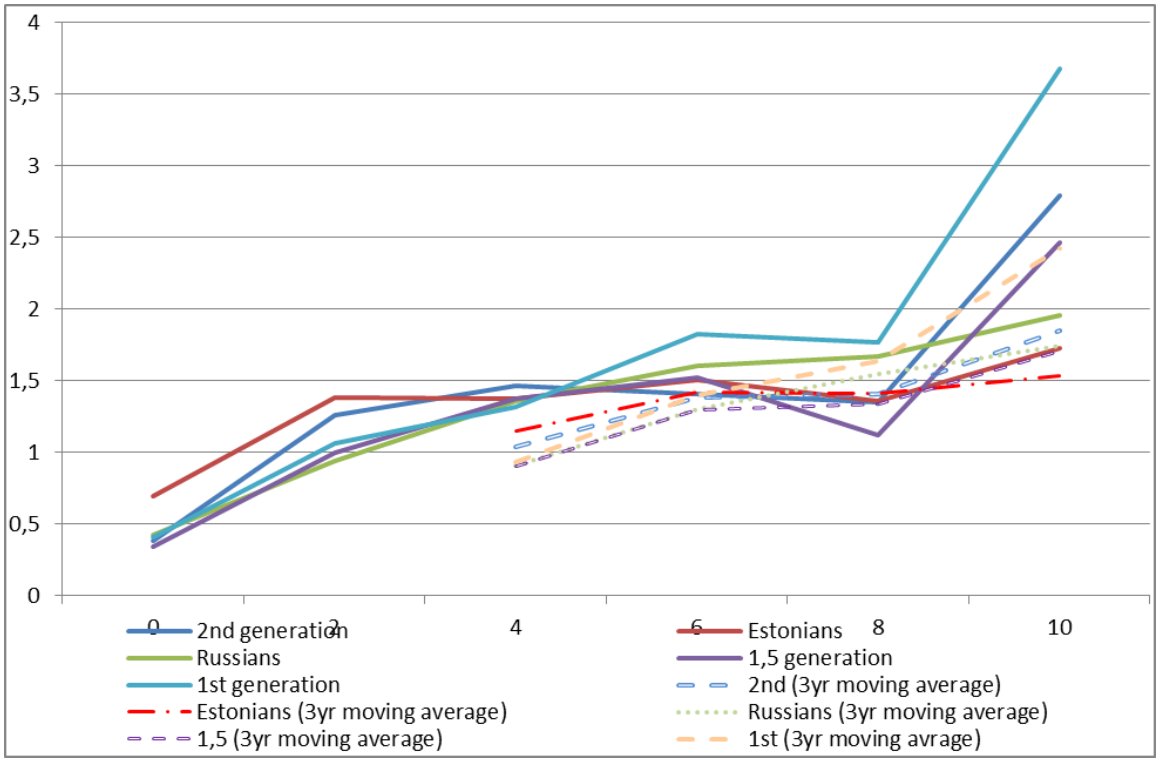


Figure 4. Relative risks for timing of second conception at different age points since first birth

6. DISCUSSION AND NEXT STEPS

This paper set the purpose of testing the effects of migration on fertility by comparing first and second generation immigrant Russians to their host and origin country populations (native Estonians and Russians in Russia, respectively). In addition, the first generation immigrant Russians were separated based on their age at migration into the one and a half generation (1,5) migrants and migrants who came to Estonia as adults ('first generation' here). The socialisation hypothesis was tested by looking at the risks and timing of first and second births with piecewise constant exponential models.

The first hypothesis regarding the first generation immigrant Russians (who moved to Estonia as adults) being more socialised in their origin country and thus resembling Russians in Russia more than native Estonians was not confirmed in terms of timing of first birth and was only partly confirmed for the older cohorts in terms of first birth risk. They started their childbearing at the latest age compared to all other groups which can be attributed to their migration coinciding with the most active childbearing ages. However, their later start of childbearing did not result in higher risks of having children in their thirties. Such a postponement effect was more visible for the native Estonians. It is also possible that older cohorts of the first generation immigrant Russians originated from closer regions to Estonia which had similar demographic behaviour, and thus these cohorts show similarities with the native Estonians in their first birth risks. Adding the region of origin (in terms of geographical location) would give more insights about it (it was not possible to include this information based on the current situation of data where labels for several Russian regions were missing). The first socialisation hypothesis (H1) was confirmed in terms of risk and timing of second birth - the first generation immigrant Russians had their second child at a similar pace as Russians in Russia did. The differences in socialisation between different cohorts of the first generation immigrants suggests that the characteristics which influence first birth, disappear or change by the time of second birth for the observation group. These characteristics may be associated either to the (stressful) move itself or to some characteristics at the new destination. Therefore other hypothesis of the migration effects on fertility should be explored.

The results for the 1,5 generation were not so straightforward. The second hypothesis (H2) regarding the 1,5 generation expected that due to them being socialised more to the Estonian society compared to the first generation migrants, the 1,5 generation would resemble native Estonians the most. This resemblance to the native Estonians emerges only in the risks of first birth among those born in 1944-1953 and later. In the timing of first birth, the 1,5 generation immigrant Russians resemble Russians in Russia – they start with childbearing relatively early, thus not confirming the second hypothesis. Also, analysis of second birth did not give a straightforward answer to the second hypothesis as there was no clear similarities in the second birth risks as well as timing of second birth between the 1,5 generation immigrant Russians and native Estonians. However, the 1,5 generation immigrants did not resemble Russians in Russia either in their risks of second birth, therefore it cannot be concluded that they have socialised to the Russian society. The birth cohort of 1954-1963 of the 1,5 generation indicated resemblance to the native Estonians, but this disappeared in the following cohorts. Although it appeared that the 1,5

generation immigrant Russians are different, or in some cases show opposite trends compared to the first generation immigrant Russians, the socialisation of the 1,5 generation to the Estonian society cannot be confirmed yet based on current results.

The third hypothesis regarding the second generation immigrant Russians resembling native Estonians was confirmed in terms of first birth risks, but not the timing of first birth. The second generation immigrant Russians had similar risks of first birth to that of the native Estonians (as well as the 1,5 generation immigrant Russians born in 1944-1953 and onwards). However, they started their childbearing at relatively early ages, resembling to Russians in Russia the most. The hypothesis was also not confirmed in terms of second birth risks where the second generation immigrant Russians resembled the 1,5 generation immigrant Russians the most, but it was confirmed regarding the timing of second where they resembled native Estonians most.

There are mixed results regarding the socialisation of foreign-origin population in Estonia in terms of their fertility behaviour. Older cohorts of the first generation migrants who moved to Estonia as adults show some similarities to the native Estonians in some indicators, but for the most part confirm socialisation to the Russian society. The 1,5 generation and second generation immigrant Russians might start showing clearer socialisation to the Estonian society once completed fertility of the younger cohorts can be assessed as well, however, at the moment the second generation immigrant Russians indicated resemblance towards Russians in Russia than the first or 1,5 generation immigrants. This suggests that some cohorts of the second generation immigrant Russians may have been influenced more by Russian environment and norms (through schools, media) than the first or 1,5 generation immigrants. On the other hand, on several occasions, the second generation immigrant Russians (who were all born after 1945) were similar to the 1,5 generation immigrant born in the same period which suggests that there might also be some period effects at play. Interestingly, the 1,5 generation immigrant Russians and first generation immigrant Russians showed opposite trends in some of the fertility indicators, stressing the need to distinguish between the generations when migrant population behaviour is analysed. Also, the age at migration helps to control for different socialisation effects at different life periods (childhood or adulthood).

Current analysis did not analyse short-term effects of migration on fertility, such as disruption, interrelation of events and adaptation which might give additional insights into the fertility differentials between the observation groups. The next steps will focus on including time-varying information about partnership(s) at the time of first and second birth, such as having a partner (or being married) at the time of the births and country of origin of the corresponding partner. For a clearer insight about migration effects on the timing of births, the duration until first birth since migration should be analysed as a time-varying variable. In addition, the analysis could be repeated for the total first generation immigrant Russians, including those who had their first child before migration in order to see how results would differ from the current ones.

Data restrictions included missing information on the type of children in the Russian case due to which the number of first and second births may be underestimated. Also, as the data were not representative of two major cities in Russia, this might alter the conclusions even more. Therefore conclusions made in reference to the Russians in Russia should be taken cautiously.

7. REFERENCES

Andersson, G. (2004). 'Childbearing after Migration: Fertility Patterns of Foreign-born Women in Sweden'. *International Migration Review 38(3*, pp. 747-774.

Blossfeld, H.-P. and G. Röhwer (2002). *Techniques of event history modeling. New approaches to causal analysis.* Erlbaum, Hillsdale (NJ), Second Edition.

Blossfeld, H.-P., K. Golsch and G. Röhwer (2007). *Techniques of event history modeling using Stata. New approaches to causal analysis*. Mahwah (NJ): Erlbaum.

Buckley, C.J., E.T. Hofmann and Y. Minagawa (2011). 'Does nativity matter? Correlates of immigrant health by generation in the Russian Federation.' *Demographic Research* 24(32), pp. 801-824. Max Planck Institute for Demographic Research: Rostock.

Coleman, D. (1994) .'Trends in fertility and intermarriage among immigrant populations in western Europe as measures of integration'. *Journal of Biosocial Science,* 26, pp. 107—136.

Gaarssen, J. and H. Nicolaas (2008).' Fertility of Turkish and Moroccan women in the Netherlands: Adjustment to native level within one generation', in T. Frejka, T. Sobotka, J. M. Hoem, and L. Toulemon (eds.), *Childbearing trends and policies in Europe. Demographic Research, Special Collection* 7 19 (33), pp. 1249-1280. Max Planck Institute for Demographic Research: Rostock.

Haug ,W. (2000). National and immigrant minorities: problems of measurement and definition. *Genus,* LVI(1-2), pp. 133-148.

Haug W., P.Compton, and Y.Courbage (Eds) (2002). *The demographic characteristics of immigrant populations. Population Studies* 38. Council of Europe: Strasbourg.

Hoem, J. and M. Kreyenfeld (2006). ' Anticipatory analysis and its alternatives in life-course research. Part 2: Marriage and first birth.' *MPIDR Working Paper series WP 2006-007*. Max Planck Institute for Demographic Research: Rostock.

Integratsiooni monitoring (2011). *[Integration Monitoring Survey]*. Ministry of Culture of Estonia, Tallinn.

Katus, K., A.Puur and A.Põldma (2002a). *Eesti põlvkondlik rahvastikuareng [Cohort Population Development in Estonia]*. EKDK WP D-2. Estonian Interuniversity Population Research Centre: Tallinn.

Katus, K., Puur, A., and Põldma, A. (2005). 'Challenges of International Migration to Receiving Countries: Estonia in the European Perspective'. Presentation presented at the XXV IUSSP conference, Tours, France, 18-25 July, 2005.

Katus, K. and A. Puur (Eds.) (2006). *Eesti rahvastikuarengu raamat [Population Development in Estonia]*. EKDK WP D-5, Estonian Interuniversity Population Research Centre: Tallinn.

Katus, K., A.Puur and L.Sakkeus (2002b). Immigrant population in Estonia, in: W. Haug, P. Compton and Y. Courbage (Eds.), *The demographic characteristics of immigrant population. Population studies*, 38, pp.131-192. Council of Europe: Strasbourg.

Katus, K. A.Puur and Põldma, A. (2008). Estonian Family and Fertility Survey. Second round. Standard tabulations. Estonian Interuniversity Demographic Research Centre, RU series C, 26, Tallinn

Klesment M. and L. Sakkeus (2010).' Household Income Surveys in Estonia between 1950s and 1980s.' *EKDK Working Paper Series C -29*. Estonian Interuniversity Population Research Centre: Tallinn.

Kesseli, K. (2007). First Birth in Russia: Everybody does It – Young. *Finnish Yearbook of Population Research*, 43 (2007-2008), pp. 41-62.

Kulu, H. (2003). 'Housing differences in the late Soviet city: the case of Tartu, Estonia'. *International Journal of Urban and Regional Research* 27(4), pp. 897-911.

Kulu, H. and N. Milewski (Eds) (2007). Interdependencies in the life course: family, fertility, and migration . *Demographic Research, Special collection; S6.* Max Planck Institute for Demographic Research: Rostock.

Kõll A. M. and Valge, J. (1998). *Economic Nationalism and Industrial Growth. State and Industry in Estonia 1934-1939*. Studia Baltica Stockholmiensia 19, University of Stockholm: Stockholm.

Kährik, A. (2006). Socio-spatial residential segregation in post-socialist cities: the case of Tallinn, Estonia. *Dissertationes Geographicae Universitatis Tartuensis 29*. Tartu University: Tartu.

Liimets E. (2008). 'Ühest riigikorrast teise [From one state order to another]', in: E. Eek-Pajuste (ed). *Teine tulemine II. Välisministeeriumi loomise lugu. [Second coming II. History of creating Ministry of Foreign Affairs]*. Eesti Välisministeerium: Tallinn, pp.91-100.

Milewski, N. (2010). *Fertility of Immigrant. A Two-Generational Approach in Germany*. Demographic Research Monograph, Max Planck Institute for Demographic Research: Rostock, Germany.

Puur A., A. Põldma, and L. Sakkeus (2009a). Fertility patterns among foreign-origin population: evidence from Estonia. Paper presented at the XXVI IUSSP, Marrakech, Marocco, 27 Sept-2 Oct, 2009.

Puur A., A. Põldma and L. Sakkeus (2009b). Estonian Family and Fertility Survey 2nd Round. Foreign-origin population. Standard tabulations. EKDK WP C-27. Estonian Interuniversity Population Research Centre: Tallinn.

Puur, A. and L. Sakkeus. (1999). *Estonia: Migrants' Labour Market Experience in the 1990s*. Repoert edited by Zh. Zayonchkovskaya. CIS Research Center on Forced Migration, Adamant Publishing Company: Moscow.

Rahnu, L. (2011). The impact of socialization with natives on demographic behavior of foreign-origin population in Estonia. *Norface Migration Network Conference 'Migration: Economic Change, Social Challenge'*, 4-9 April 2011. University College London.

Rogers, A., R. Raquillet, and L.J. Castro (1978). 'Model migration schedules and their applications'. *Environment and Planning A* 10(5), pp. 475 – 502.

Sakkeus L. (1994). 'The Baltic States', in S. Ardittis (Editor). *The Politics of East-West Migration*, pp.68-85. St.Martin's Press: New York.

Sakkeus, L. (2007). 'Population development from the social cohesion perspective', in: A. Purju (Ed.), *Social Trends 4*, pp. 10-38. Statistics Estonia: Tallinn.

Scott, K. and M. Stanfors. (2010).' Second Generation Mothers. Do the children of immigrants adjust their fertility to host country norms?', in. T. Salzmann, B. Edmonton and J. Raymer (eds), *Demographic Aspects of Migration.* Verlag-Springer, Wiesbaden. pp. 123-152.

Sinyavskaya, O. (2012). Managing non-response in the Russian and in East European context. Presentation made at the SCOHOST's Seminar Managing Problems with Missing Data in Survey Research, Sigtuna, Sweden, 10.09.2012.

Sobotka, T. (2008). 'The diverse faces of the second demographic transition in Europe.' in: T. Frejka, T. Sobotka, J. M. Hoem, and L. Toulemon (eds.), *Childbearing trends and policies in Europe. Demographic Research, Special Collection* 7**,** 19(8), pp. 171-224.

Statistics Estonia (2011). Population Census 2000. (http://pub.stat.ee/px-web.2001/I_Databas/Population_census/13Place_of_birth._Parents_place_of_birth/13Place_of_birth._Parents_place_of_birth.asp) accessed on 28 Aug 2011.

Tuma, N. and Hannan, M. (1984). *Social Dynamics: Models and Methods*. New York, Academic Press.

Vikat, A., Z. Spéder, G. Beets, F. C. Billari, C. Bühler, A. Désesquelles, T. Fokkema, J. M. Hoem, A. MacDonald, G. Neyer, A. Pailhé, A. Pinnelli, and A. Solaz (2007). *Generations and Gender Programme: Concepts and Guidelines*. UN ECE: New York and Geneva.