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POPULATION PROJECTION OF THE CZECH REPUBLIC TO 2100

Terezie Štyglerová – Michaela Němečková¹⁾

ABSTRACT

The article presents the assumptions and results of the latest population projection of the Czech Republic prepared by the Czech Statistical Office (released in July 2013). The projection (in all three variants) was computed for the period 2013–2100 to show the whole history of almost all the cohorts currently living, especially the largest ones (born in the 1970s). The projection assumes a slight increase in fertility compared to the current level in the medium and high scenario (and a shift to older ages), increasing life expectancy (more for men) and the continued attractiveness of the Czech Republic as a migration destination (a positive balance of migration). The article discusses population growth, in particular the decrease in population size as a result of the balance of natural change and migration and substantial changes in the age structure, and estimates are presented for the number of persons who will have old-age pension entitlements. While the article presents the assumptions (and rough comparison of the assumptions in the previous projection) and the results of future population development in all three variants, the main focus is on the medium variant.

Keywords: population projection, Czech Republic, population ageing, population decrease

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INTRODUCTION

The Czech Statistical Office published a new population projection in July 2013 (*Czech Statistical Office*, 2013a), four years after the release of the previous one. Compared to the projection published in 2009 (*Czech Statistical Office*, 2009) the new projection period was extended to 2100, specifically to 01/01/2101, to show the whole history of almost all currently living generations, especially the largest one, the generation born in the 1970s. The component method was used for the calculation (by units of age and using one calendar-year step, with the CR as one region, i.e. not as the sum of the region projections). The projection was elaborated separately in three variants – low, medium, high – to express the range of the most probable value of indicators of future population development (from the point of view of the authors). The names of the variants reflect the differences in the expect-

ed development of the individual components of population development, i.e. the smallest increase in fertility and mortality and the lowest net migration were incorporated into the low variant, while for the high variant it was vice versa. The authors consider the assumptions and results of the medium variant the most likely outcome, but possible future population development should be interpreted according to the results given by both extreme variants. The projection assumed a fluent development and thus does not take into account such sudden external influences as short-term deep economic crisis, significant changes in the system of social measurements, legislative changes affecting the conditions of entry and residence of foreigners in the CR, epidemics of diseases, natural disasters etc., which can, of course, occur and in the short term can significantly affect population development.

1) The authors of the article are also the authors of the projection discussed here.

The used input population size and structure by sex and age, which was the population as of 1 January 2013, was based on the Census 2011 results. The last projected results on the population structure are as of 1 January 2101 and refer to population change for the year 2100.

PROJECTION SCENARIOS

The assumptions formulated about future population development were mainly based on recent demographic development in the Czech Republic as known and understood at the time the projection was calculated, on the demographic situation and trends in most developed European countries, and, in a short term perspective, on currently applicable legislation or proposed legislative changes.²⁾ The assumptions and results of other current projections for the Czech Republic³⁾ were also examined (*Eurostat*, 2011; *United Nations*).

Like Projection 2009, the basic assumptions in the new projection were a further rise in the fertility rate (but this time only in the medium and the high variant) and life expectancy and positive net migration (except a short period of negative migration balance in the low variant), but they were the lower values of the aggregated indicators characterising the total level of these demographic processes

that were used. This was mainly the case of fertility and migration, but there were also slightly more moderate expectations concerning the estimate of the increase in life expectancy. Thus in the context of the previous projection the latest population projection prepared by the Czech Statistical Office presents a more pessimistic image of the future demographic development of the Czech Republic.

The more pessimistic expectation for the development of fertility intensity in Projection 2013 than in the projection prepared four years earlier was based on the recent trend in the total fertility rate. Projection 2009 was prepared at the time of a sharp increase in fertility, while in the period of 1995–2005 the total fertility rate was under 1.3 children per woman and by 2008 had risen as high as 1.50. The optimistic vision of a further continuation of this development was one of the projection's basic assumptions. It was expected that the emerging economic crisis would not be long term and that the effect on the fertility level would thus be only short term. However, the increase in the fertility rate soon ceased. Even four years later the total fertility rate had neither surpassed nor reached the level of 2008. Moreover, fertility was lower in 2011–2012 than in 2008–2010 and also the preliminary results for 2013 do not indicate that fertility is recovering. For a large part of the population the conditions for having children are not

Table 1 Expected development of fertility, mortality and external migration in 2012–2100

Year	Total fertility rate			Life expectancy at birth (men / women)			Net migration		
	low	medium	high	low	medium	high	low	medium	high
2012 ^{a)}	1.45	1.45	1.45	75.0/80.9	75.0/80.9	75.0/80.9	10,293	10,293	10,293
2015	1.45	1.45	1.45	75.6/81.4	75.8/81.6	75.9/81.8	–996	8,934	18,864
2030	1.45	1.50	1.52	78.2/83.8	79.5/85.1	80.6/86.1	2,226	11,659	21,110
2050	1.45	1.56	1.61	81.1/86.2	83.0/88.0	84.6/89.3	5,571	14,384	23,291
2100	1.45	1.56	1.61	84.2/88.8	86.6/91.1	88.4/92.9	10,350	17,671	25,400

Note: ^{a)} observed data.

- 2) New legislation on the residence of foreigners in the Czech Republic, which institutes a more restrictive approach to migration for the purpose of employment and business, was in the inter-ministerial commenting stage of legislative procedure at the time the assumptions of this projection were being prepared.
- 3) However, comparing the assumptions and results of these projections cannot be the subject of this article given the scope of such a topic.

ideal, especially as far as the economic situation and achieving an easy and affordable work-life balance for women are concerned. In spite of the recent trend in fertility, Projection 2013 assumes a gradual, but not very significant, increase in the fertility rate, but only in the medium and high scenarios. The low scenario calculated with the stagnation of the total fertility rate at its 2012 level, i.e. at 1.45 children per woman. But all three scenarios envision a further increase in the mean age of mothers at childbirth varying according to the given variant.

The maximum (target) level of the total fertility rate was set from 1.45 in the low scenario, through 1.56 in the medium scenario, to 1.61 in the high scenario. For the next three years the scenario of fertility was identical in all three variants, assuming stagnation at the current level of 1.45 children per woman, but with a slightly rising mean age of mothers at childbirth. By 2030, the rise in the total fertility rate to 1.50 in the medium and 1.52 in the high scenario was included in the projection, along with a continuing decline in the fertility of younger women (aged 28 years and under) and increase in the fertility of older women, especially women aged 35 and over. These age-specific structural changes in fertility were expected to continue in the next two decades but at a slower pace. For the period of 2030–2050 a rise in fertility to 1.56 in the medium scenario and to 1.61 in the high scenario were envisioned, and the models of fertility in 2050 for all three scenarios were fixed for the rest of the projection period (2051–2100). The apex of high fertility intensity was expected to remain around the age of 30, but the age-specific rates were considered to be slightly higher than they currently are. The medium scenario used 30.8 years as its target average age at childbirth, and this average age was 0.2 of a year higher in the high scenario and 0.4 of a year lower in the low scenario.

Hypotheses for the earliest future development of fertility were formulated primarily on the basis of the generation approach, but a combination of the cohort and period approaches was used for subsequent periods. The estimated intensity of fertility and its structure by the age of each cohort were corrected to fulfil the initial estimates of the target values of the total period fertility rates and their structures by age in turning years (2030 and 2050). It was as-

sumed that preceding and future development would lead to a decrease in completed fertility rates over time. It is highly probable that completed fertility rate will not even reach two children per woman. So, in our calculations we assumed that the last birth cohort of women whose completed fertility is higher than 2.0 children were born in the late 1950s and early 1960s. For women born in the 1960s lower completed fertility rate is assumed (2.0–1.89). And, further continuation of this trend is expected so women born in the 1970s and 1980s will not reach the fertility levels of older cohorts. Their completed cohort fertility rates are assumed at 1.86–1.64 children per woman and 1.61–1.53, respectively. Only for cohorts born in the mid-1980s and younger, the completed fertility rate is assumed to stabilise at around 1.53–1.54.

The age-specific fertility rates for individual birth cohorts offer clear evidence of past changes in the timing of childbearing and thus of potential changes in the future. While women born in 1965 have on average 1.68 children at the age of 30, women born in 1970 have only 1.46, women born in 1975 only 1.14 and women born in 1980 even fewer – 0.93 children. The age of peak fertility was 21 years in the 1965 and 1970 cohorts, but 30 years for women born in 1975. We envisioned peak fertility in the 29–31 age range for younger birth cohorts too.

Unlike the fertility rate, the life expectancy of men and women was assumed to increase in all variants and for the whole projection period. Thus, none of the scenarios envisions either the deterioration or the stagnation of mortality intensity in the Czech Republic in the next nine decades. A more significant decrease in mortality was expected for men, which will result in a further reduction of excess male mortality. These assumptions reflect the trend in mortality since the late 1980s, the fact that the Czech Republic still lags behind more developed countries in this regard, and the assumptions included in other population projections for the Czech Republic and the visions of other demographers (e.g. Rychtaříková). Since the mortality trend in reality differed very little from what was expected in Projection 2009, the target values of life expectancy at birth to 2030 remain the same in the new projection. In reaction to mortality assumptions in other population projections for the Czech Republic and some comments in the media or feedback

Figure 1 Observed and expected age-specific fertility rates (per 1,000 females) in 2012–2100, medium scenario

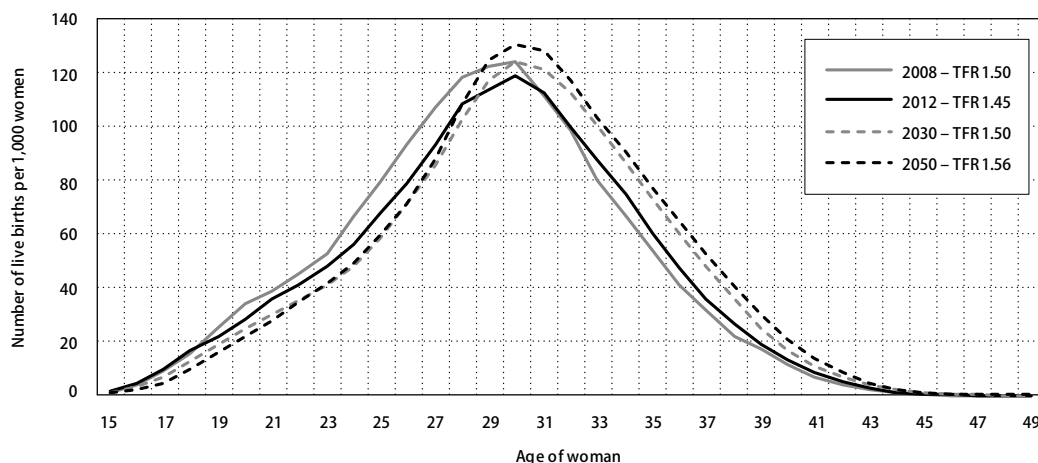
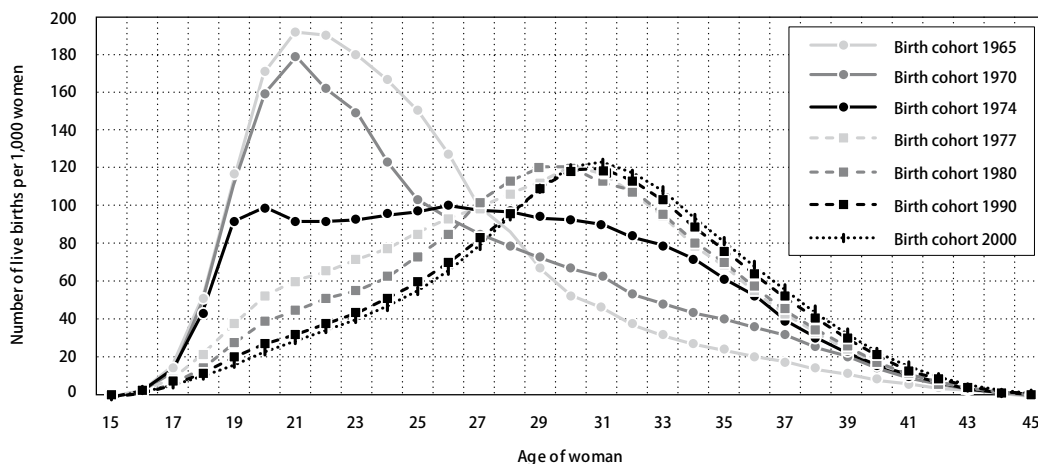


Figure 2 Observed and expected age-specific fertility rates (per 1,000 females) for selected birth cohorts, medium scenario



from experts (e.g. Burcin & Kučera) about optimistic expectations for the future development of mortality in Projection 2009, a slower increase in life expectancy for the rest of the projected period (2031–2100) was used in the scenarios in Projection 2013, so that the values of life expectancy at birth that Projection 2009 expected to reach in 2065 (the last year of that projection) were expected to be reached in 2100

in the new projection. Methodologically, the target values of life expectancy at birth and the probabilities of deaths for each sex and age were set for the years 2030, 2050 and 2100. Between these turning years the linear interpolation of indicators was applied. Unlike the mortality age profile currently used in the life tables produced by the Czech Statistical Office (Gompertz-Makeham function at higher ages),

the expected mortality at higher ages was adjusted to the logistic profile.

In the medium scenario, life expectancy at birth was expected to increase from the current 75.0 years for men and 80.9 years for women by 4.5 and 4.2 years, respectively, until 2030, and then to rise gradually to the end of the century by a further 7.1 years for men and 6.0 years for women to reach 86.6 and 91.1 years. A less intensive increase, to 84.2 and 88.8 years, respectively, to be reached in 2100 (in total by 9.2 and 7.9 years between 2012 and 2100), was used in the low scenario. Conversely, the high scenario calculates with the most intensive decrease of mortality, the target values of life expectancy in 2100 were 88.4 and 92.9 years (total increase by 13.4 and 12.1 years).

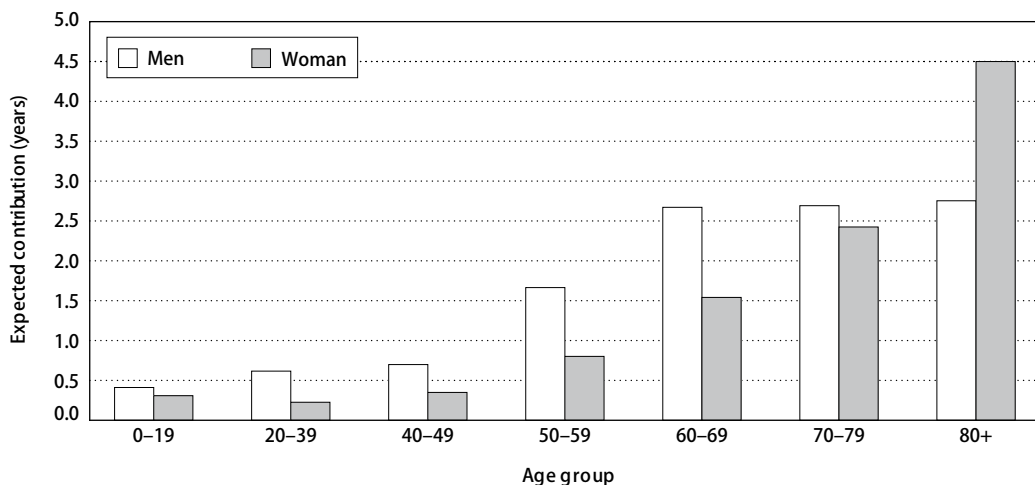
It was expected that the decrease in mortality in the age 60 and over will determine the future development of the total mortality rate the most. Concerning female mortality, the decrease will be concentrated mainly in the age group 80 years and over. However, a decrease was also expected in other age groups (generally the lower the age the lower the influence on rise in life expectancy at birth).

It is well known that the most difficult part of making population projections is forecasting the future vol-

ume of external migration and its structure according to sex, age and country of origin. International migration is significantly influenced by external factors, most notably legislation defining the conditions of entry and residence of foreigners in the country, which can continuously be altered in response to current political, economic, social or demographic circumstances. In addition, the trend in external migration in the Czech Republic has been very uneven in the recent past, mainly owing to changes in methodology and data sources for statistics, and another very important issue has been that of data quality. Thus the assumptions about future development could not be reliably based on long-term time series of migration indicators. The recent development was unstable, with various short-term fluctuations such as a doubling of net migration in 2007–2008, a negative balance in 2001, or a decrease in 2012. Some of the fluctuations were produced by a change in data source.

Real net migration in 2010 and 2011 (15.6 and 16.9 thousand) corresponds most closely to the low-scenario estimate in Projection 2009 (expected gains 15 thousand yearly). In 2012, the excess of immigrants over emigrants decreased to 10.3 thousand. The still unfavourable economic situation and the preparation of new, generally more restrictive, migration legislation were the bases

Figure 3 Expected contributions of age groups to the rise in life expectancy between 2012 and 2100, medium scenario



for assuming lower positive net migration in Projection 2013, including the possibility of a temporary period of a negative migration balance in the low variant.

Methodologically the forecasting of external migration in Projection 2013 was based on the expected volume and sex and age structure of external immigration and expected rates of emigration by sex and age. These structures and rates were applied as fixed for the whole projection period and were the same in all three variants, and they were created as an average of the structures observed in 2002–2012. The overall size of immigration flows into the Czech Republic from abroad was assumed to be 20–40 thousand per year, depending on the variant. The number of emigrants will have a generally decreasing trend in all three variants as a consequence of changes in the age structure and the depopulation of the Czech Republic. The result is a rise in net migration from 8.6 thousand in 2013 to 17.7 thousand in the medium projection variant. In the high variant net migration is expected to range from 18.6 thousand to 25.4 thousand, and in the low variant a negative balance of foreign migration is even expected in the early years of the projection, which will later increase to 10.4 thousand persons by the end of the projection period.

PROJECTION RESULTS

Projected population size

The basic results of a projection are population size and age structure. According to the results of demographic statistics (following up to the Census 2011 results) the population of the Czech Republic was 10,516,125 as of 1 January 2013. Since 2003 the population of the Czech Republic has been increasing, particularly owing to external migration. The natural increase (excess of live births over deaths) had also been positive since 2006, but it dropped in the last two years and is projected to be negative in 2013 and in the years to come.

According to the results of Projection 2013, the recent population increase will soon be replaced by a population decrease. The population will continuously grow to 10.54 million (as of 1 January 2018) in the medium variant, and to 10.66 million (by 1 January 2027) in the high variant. The entire increase will come from the positive balance in external migration. The balance in natural change will be negative throughout the period of the projection. Due to the stagnation of low fertility and negative net migration in the early years of the projection the low variant indicates a long-term trend of population decreases in the Czech Republic with no year of exception.

Table 2 Projected population (thousand) in 2011–2101 (1 January)

	2011 ^{a)}	2021	2031	2041	2051	2061	2071	2081	2091	2101
Medium variant										
Total	10,487	10,528	10,374	10,098	9,778	9,337	8,781	8,308	7,965	7,684
Men	5,147	5,175	5,097	4,967	4,825	4,611	4,347	4,139	3,987	3,854
Women	5,340	5,353	5,276	5,130	4,953	4,726	4,434	4,169	3,978	3,829
Low variant										
Total	10,487	10,418	10,062	9,567	9,030	8,374	7,639	7,016	6,527	6,095
Men	5,147	5,114	4,927	4,680	4,418	4,091	3,739	3,455	3,228	3,021
Women	5,340	5,305	5,135	4,887	4,612	4,283	3,900	3,561	3,299	3,074
High variant										
Total	10,487	10,634	10,654	10,571	10,442	10,186	9,793	9,450	9,234	9,083
Men	5,147	5,235	5,255	5,231	5,192	5,078	4,897	4,755	4,674	4,598
Women	5,340	5,399	5,399	5,340	5,249	5,108	4,896	4,696	4,567	4,486

Note: ^{a)} observed data.

By the middle of this century (as of 1 January 2051) the population of the Czech Republic will decrease to 9.778 million in the medium variant (by 738 thousands). The low and the high variants project a population size of 9.030 and 10.442 million, respectively. The most noticeable depopulation is projected to occur in the period between 2050 and 2080. By the end of century the population of the Czech Republic will be between 6.1 and 9.1 million, i.e. 13–42% lower than at the projection threshold.

The population of the Czech Republic will decrease despite the projected long-term and continuous gains from international migration because net migration will not be able to offset the increasing difference between the number of live births and deaths. According to the medium variant the Czech Republic will gain more than 1 million inhabitants through migration by the end of century, but it will lose more than 4 million people by natural change.

Projected natural change

The number of live births peaked in 2008, when a total of 119.6 thousand children were born. In the following years the number of live births went down and this trend will not change until the beginning of the 2030s. At that time the local minimum of live births is projected to occur at a level of 78 thousand in the medium variant. The subsequent revival and increase in natality will peak around the year 2040 (at 85 thousand live births), as a consequence of the higher natality observed at the start of the century. Then the number of live births will continuously fall (or stagnate in 2060–2075) to 60 thousand live births per year. The timing of the periods of higher or lower natality is the same in all the projection variants; the only difference is in the levels.

The number of deaths will go up in all variants despite the expected increasing life expectancy at birth. The rise in deaths will accelerate in the 2030s when the large birth cohorts (born after the Second World War) pass the ages of highest mortality. After a two-decade stagnation the number of deaths will revive and will peak around the year 2070 (at 140 thousand in the medium variant). Only then will the number of deaths decrease to its current level (97–115 thousand).

Projected age structure

Like the previous projection, Projection 2013 draws attention to changes in the age structure. They will be dynamic and significant. The Czech population will get older.

The current age structure of the Czech population is characterised by a small number and share of children, a relatively large share of people in economically active age, and an (as yet) not too large number and share of elderly people. Although both the number and the share of children aged 14 and under are increasing, they are still lower than at the beginning of the century and according to the projection results will never reach that level again. The recent wave of an increasing share of children will peak at 15.4% in 2019 and in the next two decades will drop to 12.1%. In the following years the share of children will fluctuate between 12% and 13%.

The population aged 15–64 years will change more markedly. The number of inhabitants in this age group reached its peak in 2009 at 7.43 million. It then started to decrease and this trend will be a long-term one (except for some periods of stagnation). The pace of the decrease will be quickest up until 2020. As the large cohorts born in late 1940s and early 1950s reach age 65 and over, the number of 15–64 year-olds in the population will decrease

Table 3 Projected average number of vital events and average population increase in 2011–2100 (thousand), medium variant

	2011–2020	2021–2030	2031–2040	2041–2050	2051–2060	2061–2070	2071–2080	2081–2090	2091–2100
Live births	101.3	83.5	81.6	82.6	72.5	69.1	68.9	63.6	60.5
Deaths	107.3	110.0	121.6	128.3	131.5	140.3	132.5	114.9	106.1
Natural increase	–6.0	–26.5	–40.0	–45.8	–59.0	–71.2	–63.7	–51.3	–45.6
Net migration	10.2	11.1	12.4	13.8	14.9	15.6	16.3	17.0	17.5
Total increase	4.1	–15.4	–27.6	–32.0	–44.1	–55.6	–47.3	–34.3	–28.1

Figure 4 Projected development of natural change in 2010–2100

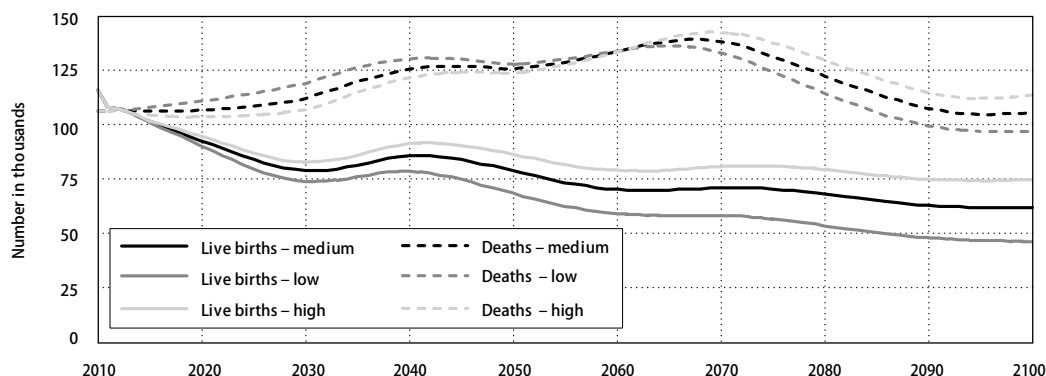


Table 4 Projected population by main age groups in 2011–2101 (1 January)

Age	Population (thousands)				Proportion of age group (%)			
	2011 ^a	2031	2051	2101	2011	2031	2051	2101
Medium variant								
0–14	1,522	1,332	1,262	937	14.5	12.8	12.9	12.2
15–64	7,328	6,525	5,342	4,248	69.9	62.9	54.6	55.3
65+	1,637	2,516	3,174	2,499	15.6	24.3	32.5	32.5
Low variant								
0–14	1,522	1,271	1,124	690	14.5	12.6	12.4	11.3
15–64	7,328	6,355	4,963	4,248	69.9	63.2	55.0	55.2
65+	1,637	2,436	2,943	2,038	15.6	24.2	32.6	33.4
High variant								
0–14	1,522	1,381	1,368	1,138	14.5	13.0	13.1	12.5
15–64	7,328	6,690	5,701	4,998	69.9	62.8	54.6	55.0
65+	1,637	2,583	3,372	2,947	15.6	24.2	32.3	32.4

Note: ^a observed data.

to 6.69–6.82 million (until 2020). Another and more significant decrease is projected to occur in the 2040s and 2050s. In this period the largest cohorts born in 1970s will reach the age of 65. By 2060 the size of the population aged 15–64 will be only around 5 million. The share of this age group will decrease from 70% (2013) to 55%.

The growth in the size of the population of seniors aged 65 and over will be the most significant. The numerical size of this age group has been increasing from the beginning of the 21st century and the subsequent rate of year-on-year increase will be connected with the age

structure (i.e. with how large the relevant birth cohorts are) and mortality level. Life expectancy has been improving and a continuous trend is expected in the projection, so a larger share of people will live to see their 65th birthday. The number of people aged 65 and over will be strongly influenced by the effects of individual cohorts born in the 20th century moving i to the over 65 category, as these cohorts substantially vary in size. Currently the large cohorts born in the late 1940s are moving beyond the age of 65; the next wave of more intensive ageing will occur in connection with the large cohorts born in the 1970s. They will begin to cause increases in the size

of the population of seniors over the age of 65 starting in the 2040s. The number of people aged 65 and over will peak around the year 2057 at 3.0–3.5 million (3.2 million in the medium variant), which means that the figure at that time could be twice what it is today. By the end of the century the number of seniors will decrease, but the projected level (2–3 million) will be higher than the current size (1.7 million).

There is no doubt that ageing will be the main feature of population development. The share of the population aged 65 and over will increase from one-sixth to one-third; the average age will rise from 41.3 to 50 years. The index of ageing (the number of people aged 65 and over per hundred children aged 0–14) will quickly rise from the current 113. It should reach 150 level before the middle of the 2020s, a value of 200 in the 2030s and 250 in the middle of the century. This means that the number of seniors will be more than 2.5 times greater than the number of children (aged 14 and under) in the Czech Republic in the middle of this century and in essence during the whole second half of this century.

The relation between the population sizes of the main age groups describes potential economic dependency. Since the age limit of 15 years does not fully correspond to the real shift from the non-active to the active economic age group, an alternative

age dependency ratio was defined with an age limit of 20 years (see Figure 5). The age dependency ratio has been rising in the Czech population and it will continue to do so significantly rise, especially from the 2040s. It is projected to peak in the late 2050s and early 2060s. In the medium variant there will be 104 persons aged 0–19 or 65+ per thousand people aged 20–64 in the Czech Republic on 01/01/2059, and in the following decade the index will decrease to 94. This development will be driven by the rise of the elderly dependent component (65+), while the younger dependent component (0–19) will not change significantly. For comparison, the current value of this index is 57 (persons aged 0–19 and 65+ per hundred people aged 20–64).

The potential increase in economic dependency should be mitigated by a shift in the official retirement age. The age dependency ratio (with people aged 0–19 and 65+ defined as economically inactive) reflecting these changes (called RET here) shows an increase from the current 69 to 76 in 2025, an ensuing decrease to 72 in 2036, and then a significant rise to 85 in 2056. But by the horizon of the projection it should be lower than today (around 60). Similarly, the estimated number of old-age pensioners (according to the currently valid legislation) will increase from the current 2.23 million to peak at 2.79 million (in 2050 according to the medium variant) and then go down to 1.62 million.

Figure 5 Projected absolute and relative age structure, 2013 and 2101 (1 January)

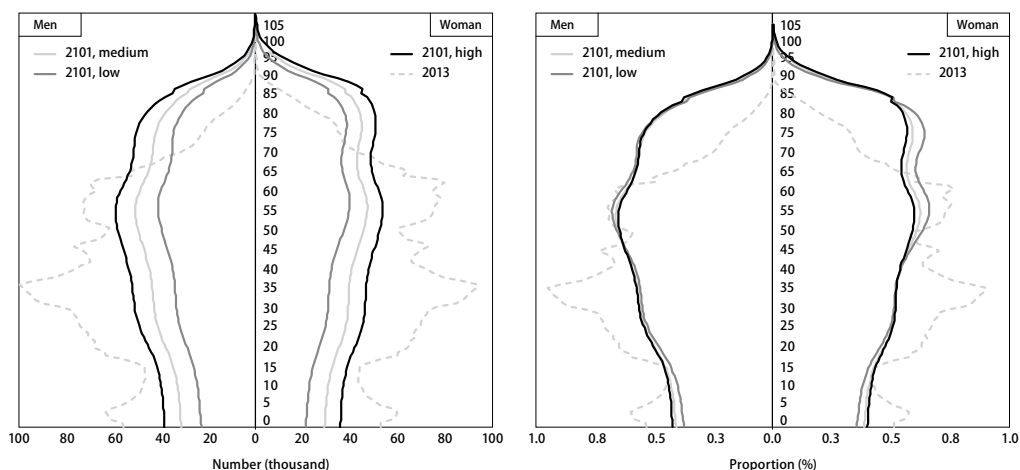
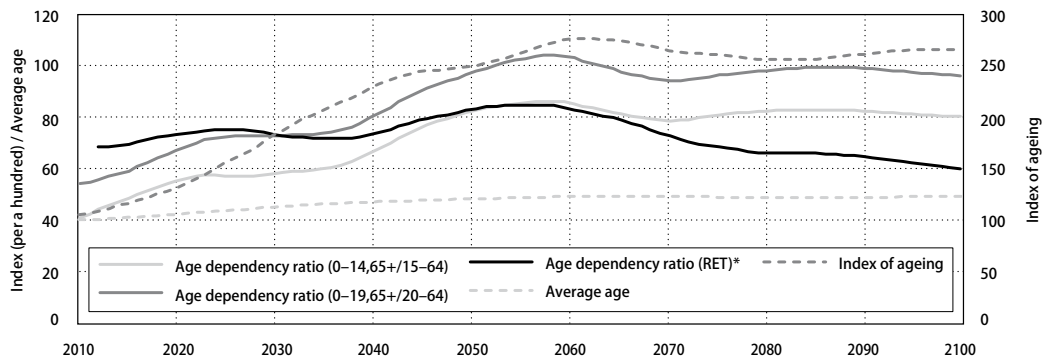


Figure 6 Projected indicators of the age structure and potential economic dependency, medium variant



Note: *) The number of people aged 0–19 years and estimated number of old age pensioners per 100 estimated number of people in productive age.

CONCLUSION

It is necessary to consider the above-cited results of the latest population projection for the Czech Republic in relation to the assumed scenarios of the future development of fertility, mortality and external migration and in relation to the initial sex and age structures of the population. The adopted scenarios reflect the level of knowledge about the demographic situation at the time the projection was calculated and understandably they can only be fulfilled to a certain extent. However, even though the projected results may not be fully confirmed by real development, it is highly probable that the main tendencies in the projected development of the age structure will occur because they are in the short and medium term significantly determined by the current age structure. To express the uncertainty of the population projection, which naturally rises with time, three variants of the projection were calculated.

Based on the present age structure of the population of the Czech Republic it is certain that the population will age. The relative share of seniors aged 65 and over will grow to a third of the population in the middle of the 2050s and the size of population aged 15–64 will significantly diminish absolutely and relatively. Even the higher fertility and the larger migration gains assumed in the high variant do not prevent population ageing. Migration (even massive) may maintain the population size at its current level, but it can-

not significantly change the age structure towards making it younger. It will not turn around the decrease in the share of persons aged 15–64 years and the increase in the proportion of elderly in the population. Only a high and stable level of fertility can moderate population ageing, but achieving and maintaining that seems unrealistic in the current conditions. Thus, population ageing, the intensity of which is a key finding of the projection, should be taken as an unavoidable process that will affect many areas of the functioning of society and will become a subject of attention not just from demographers. It is evident that changes in the age structure of the Czech population will have substantial consequences mainly on the social security system and health care system and should be accompanied by changes in these systems, in the system of services aimed at the elderly and many other areas of society.

Another finding from the project is that the population will begin to decrease, in 2017 according to the medium variant, in 2027 according to the high variant, and in the low variant as early as the first year of the projection, i.e. in 2013. The only increases will come from external migration, while natural change is projected to be negative at the outset of the projection period in all three variants. Thus a negative natural balance will be a permanent feature of demographic development in the Czech Republic. The population could be 13–42% lower at the end

of the century than it was at the beginning of 2013. With the expected gains of inhabitants through migration, the proportion of foreigners in the population will grow. At present, the Czech Republic has a below-average share of foreigners in the population among the European countries at slightly over 4% of the population, which should rise to a fifth of the population (in the medium variant). It may seem difficult to imagine this from the present point of the view, but if the assumption that the Czech Re-

public shall remain attractive for migrants in the long term, it will occur as a process (not a sudden change), to which Czech society will adapt and get used to gradually.

Detailed results on the population size and the population structure by sex and age and selected aggregated analytical indicators of all three variants are available on the website of the Czech Statistical Office <http://www.czso.cz/csu/2013edicniplan.nsf/p/4020-13>.

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MALE FERTILITY IN THE CZECH REPUBLIC – FIRST EMPIRICAL EVIDENCE^{*) †)}

Beatrice Chromková Manea¹⁾ – Ladislav Rabušic

ABSTRACT

The present article tackles new empirical evidence in the study of male reproductive behaviour in the Czech Republic. It builds on a previously published theoretical and methodological overview on the chosen topic. We will try to answer the following questions: (1) What is the completed male fertility level and what preferences do men have regarding family size? (2) What are the determinants of male fertility? For this purpose, we use data from an ad-hoc survey conducted in 2011 on a representative sample of men aged 40–55. The results are presented in a comparative perspective – male/female indicators. The article includes a description of the main demographic indicators of fertility with a subchapter on the measurement of fertility ideals and preferences. Further on, we present some of the covariates which determine the final level of male fertility and the ideal number of children at both individual and societal levels. Some of the findings point to the lack of data from official statistics necessary to calculate the main indicators of male fertility. However, these deficiencies are partially removed by the results obtained from the analysis run on survey data.

Keywords: male fertility behaviour, completed fertility rates, ideal number of children, fertility determinants

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1. INTRODUCTION

The international and Czech literature examining the causes of low fertility has identified a number of factors as lying behind this demographic phenomenon. Until recently, these were usually extracted from data generated by research on female fertility. Men themselves were rarely the subject of study, or even mentioned, and, if they were, it was usually in connection with male contraception and family planning – and very often in the context of the less developed countries.

This situation began to change in the second half of the 1990s, since which time the issues of male reproductive behaviour and male fertility have gradually, and rightly, been coming into focus of international experts in the area of population studies – see e.g. *Goldschneider – Kaufman*, 1996; *Sonenstein et al.*, 1997; *Green – Biddlecom*, 2000; *Bledsoe – Lerner – Guyer*, 2000; *Toulemon*, 2001; *Tölke – Diewald*, 2003; *Rotkirch – Basten*, 2010; and *Zhang*, 2011. The reason behind this is obvious: reproduction and fertility result from behavioural

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interaction between a man and a woman and researchers seeking to comprehend this interaction and to be able to model (and possibly predict) reproduction should not ignore one of the elements of this interaction.

This research initiative has also found reflection in the Czech environment. Thanks to an overview paper by *Rabušic and Chromková Manea* (2011) – the first of its kind in the Czech Republic – certain contextual attributes of male fertility studies have been introduced into the discourse of Czech population studies. However, what needs yet to be addressed are the reasons why male fertility has hitherto rarely been discussed in analyses of reproduction, and a clarification of which indicators of male reproduction are available and which, on the contrary, are not.

The aim of this article is to build on the fore-mentioned paper and to present the first empirical findings about male fertility in the Czech Republic. We concern ourselves with the following research questions: (1) What is the completed male fertility level and what preferences do men have regarding family size? (2) What are the determinants of male fertility? Where data are available and where

it makes sense, a comparison will be drawn between men and women.

2. METHOD

If we want to gain insight into male fertility, we should compare its patterns with those of female fertility. The problem here is that we cannot generate the same indicators for men as we can for women from Czech statistical data. Births reports, which form the basis for fertility statistics, do not provide full information on all fathers – they are limited to data on fathers of children born within marriage, with data on men whose child was conceived and born out of wedlock often missing.²⁾ Data are therefore not available on the total number of children born to men or on their age distribution. These gaps in statistical recording make it impossible, for example, to compare male and female age-specific fertility rates or to compare completed fertility and out-of-wedlock fertility rates in the male and female populations.³⁾ Where it is not possible to rely on official statistics, relevant data must be obtained from quantitative surveys.

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- 2) Part of the children conceived before marriage (out of wedlock) is legitimised later by marriage (the so-called premarital conception). However, Zeman (2007: 20) points out that during the communist period most of births out of wedlock were first-order births, while nowadays a considerable portion of births outside marriage are second-order births, which may indicate the existence of functional cohabiting relationships replacing marriage, and not only premarital cohabitation with mostly first-order births, which were later legitimised by marriage.
 - 3) Since 2007, the situation has somewhat improved as to the availability of data on fathers. Records concerning children of single, divorced and widowed women have been expanded to also include analysis of the data on fathers. The problem, though, is that these data on fathers is submitted, on a voluntary basis, by the mothers of the children. From the statistical point of view, such data are likely to be incomplete. Analysis of the 2011 data shows that: ‘The highest proportion of births with no father information provided was among third-born children and children born of higher birth order. In 2011, these children accounted for 12.9% of the total number of births, and for 34.8% of children born out of wedlock. The lowest proportion of children with no father information provided out of all live births of the given birth order was among second-born children – 6.0% in 2011. In the group of children born out of wedlock, the relatively lowest proportion of children with missing father data was found among first-born children (20.0% in 2011). The proportion of children with no information on the father declines with increasing education of the mother. These children accounted for 37.3% of all children born to women with primary school education, but only 2.5% of children born to university-educated mothers. The proportion of children with no father information given also declines with the increasing age of the mother. In the group of children born to women below the age of 20 father information was missing in the case of almost every other child in 2011 (49.1%), compared to only 4.7% in the group of children born to women aged 30–34 and 7.2% in the group of children whose mother was 35 years old or older at the time of the birth (Vývoj, 2011: 20–21).’

We will seek answers to our questions by drawing on data from a representative quantitative survey for the male population aged 40–55 (see Table 5 in appendix for the sample characteristics).⁴⁾ The survey was conducted in the second half of the year 2011. Using a random sample method and a standardised questionnaire, interviewers from the *Median* agency, which carried out the data collection, interviewed men between 40 and 55 years of age, which is the age relevant to our research interests. Men in this age bracket represented the sample unit. If the man lived in a household with a female partner, whether married or cohabiting, the woman was also interviewed (using a specific questionnaire for women). In this way, data was obtained from 800 couples: as mentioned above, men were aged 40–55 years; the age range of their partners was broader. If the man lived alone, data was collected from him only – there were 450 such cases. If random sampling brought the interviewer into a household of a woman living without a male partner and aged 40–55 years, the woman was interviewed based on the questionnaire version for women. The number of these female respondents was restricted to 450. In total, information was obtained from 2,500 respondents (1,600 men and women in couples, 450 men without a spouse/partner and 450 women without a spouse/partner). For the purposes of this paper, we will largely work with the subsample of men and women aged 40+.

3. RESULTS

3.1. Completed fertility

Let us now examine male reproductive behaviour on the basis of the data collected in the special sociological survey referred to above, titled ‘Male Reproductive Behaviour’ and conducted at the end of 2011. These data provide insight into the completed

male fertility level, and moreover, into the attitudes of men concerning the number of children, conception intentions and other characteristics that affect fertility.

A standard indicator of fertility levels is the completed fertility rate. In Czech demographic statistics, the completed fertility rate is not calculated for the male population, and thus is also not published. Our survey data make this calculation possible, as it might be assumed that our male respondents, aged 40–55 years, have for the most part completed their reproduction and are rarely likely to become fathers at this age. The number of children reported by the male respondents in the survey could be interpreted as their completed number of children.⁵⁾ However, as the male reproductive cycle is not limited by a fixed age ceiling, and given the age range of the male respondents’ partners (see the paragraph below), a supplementary question was included in the questionnaire asking whether the respondent was still considering having a child in the future and how many. We could then calculate the hypothetical completed fertility rate as the total number of children the respondent already had (and had had) and the number of children he would still like to have.

The age distribution of the female part of our sample used for comparison with males differs from that of their male counterparts and ranges between 20 and 65 years. As a quarter of the females in the sample were aged 20–40 years, it could be assumed that their reproductive cycle was not finished yet. We therefore performed calculations of the completed fertility level (in the case of women aged over 40 years), as well as the hypothetical completed fertility level of women.

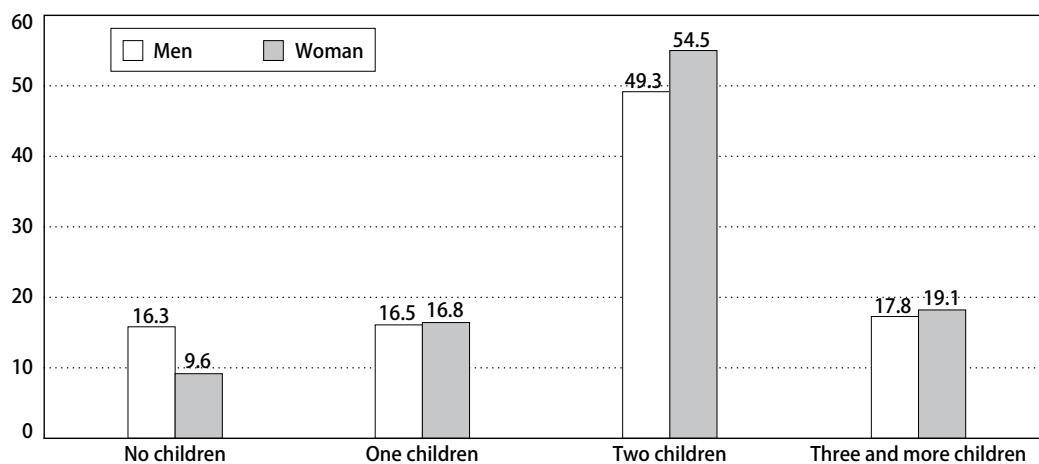
Figure 1 presents the structure of male or female respondents aged 40 and over according to the number of children they have. It shows that childlessness was more common among men than among women.⁶⁾ The proportion of men and women who had one child was the same (17%). Two was the most frequent

4) We required the sample to be representative for the Czech male population aged 40–55. Stratified random sampling was carried out in several steps by Median agency. The primary sampling units were determined on the basis of representativeness of the size of residence and county. Sampling frame was based on all address in the Czech Republic, where strata were made up of all geographic territorial units (size of residence and county).

5) All children reported by the male respondents, including adopted children, stepchildren and deceased children were considered in our analyses.

6) The difference is statistically significant at the 0.01 level (according to a t-test).

Figure 1 Percentage distribution of respondents aged 40+ regardless of family status according to the number of children they have (N=2321)



Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

number of children both among men and women. The proportion of women who had two children was higher than that of men, the percentages being 55% and 49%, respectively.⁷⁾

These findings are not particularly surprising. An even higher proportion of childless men than childless women might have been expected considering that the first marriage rate is lower for men than it is for women and, at the same time, the remarriage rate among divorced men and women is about the same.⁸⁾ The statistically significant higher proportion of childless men than childless women is also confirmed by data from another survey we conducted in 2005 (unpublished results).⁹⁾ In this survey, 27% of men compared to only 10% of women in the 35–39 age group were childless; 20% of men had one child (24% of women), 42% of men had two children (52% of women), and 11% of men had three children (14% of women). Given that the respondents were born

in the period 1965–1985, they constitute one of the first generations whose reproductive period falls, more or less, under the new demographic regime. The data above indicated that the total fertility rate of Czech women would not be particularly staggering in 5–6 years' time, that is in 2010–2011.¹⁰⁾

Data from our survey thus indicate the following pattern: men are childless statistically significantly more often than women, and women have two children statistically significantly more often than men. Men and women who have one child do not statistically differ, and neither do those who have three or more children (according to T-test results).

However, men and women basically do not differ as regards the total average number of children, as shown in Table 1 (the row 'completed fertility rate'). On average, men had 1.75 children and women had 1.84 children. In the light of the divorce and remarriage rates (but bearing in mind that the remarriage

7) The difference is statistically significant at the 0.05 level.

8) Total male first marriage rate based on first-nuptiality tables was 53.5% in 2011, while the female rate was 61% in 2011 (data from *Demografická ročenka ČR 2011*).

9) This sociological survey was called 'Marriage, Work and Family' and the data were collected from a representative sample of Czech women aged 20–40 and their male partners (N = 2,456 respondents) in 2005. *Unpublished*.

10) Indeed, the total fertility rate was 1.49 in 2010 and 1.43 in 2011.

rates for divorced men and women are similar), we expected men to have higher completed fertility rates, as they marry younger female partners with whom have higher chances to have additional children and have a higher average number of children than women.^{11), 12)} Our expectation was not fulfilled, but partially confirmed the results obtained by *Pakosta* (2008), who found, on the one hand, that divorcing before childbearing in the case of women increases the likelihood that women give birth to only one child, and, on the other hand, a large proportion of women who divorced after having a child(ren) and remarry then plan to have/have another child (they attempt to fulfill their desired number of children not reached in the previous marriage), which is reflected in a higher completed fertility rate for remarried women compared with women who never divorced.

If men aged 40–47 have been realised their expected fertility (see Table 1), the level of completed fertility would obviously have increased slightly, but not enough to reach and outdo the rates for women.

Yet another finding can be drawn from Table 1. The average number of children in the group of male respondents aged 48–55 years is higher than

the average figures in the 40–47 age group, which suggests that men have children even around the age of fifty. The average number of children in the group of women aged 48 years and over is also higher than in the 40–47 age group.¹³⁾ This might be due to the higher completed fertility rate of older cohorts, which had children in the 1970s. This is valid for men too (see *Rychtaříková*, 2004).

No differences could be found between the groups regarding the hypothetical completed fertility rate either (see Table 1), with a level of 1.83 children for men and 1.90 for women. The hypothetical completed fertility level is slightly higher than the actual completed fertility rate in the group of men aged 40–47 years, indicating that some men at this age were still planning to have children. As regards women aged 40 years and over, the actual and hypothetical completed fertility do not de facto differ. Hence, the surveyed generation of women were not planning to have children with their spouses or partners past the age of 40.

These findings do not point to any substantial differences in the reproductive behaviour of men and women who, for the most part, fulfilled their fertility aspirations in the period of so-called ‘Czech

Table 1 Actual and hypothetical completed fertility by sex and age groups (respondents aged 40+)

	Males total (N=1,251)	Age 40–47 (N=613)	Age 48–55 (N=619)
Completed fertility rate (CFR)	1.75	1.65	1.85
Hypothetical completed fertility rate (HCFR)	1.83	1.80	1.86
	Females total (N=1,070)	Age 40–47 (N=585)	Age 48+ (N=507)
Completed fertility rate (CFR)	1.84	1.82	1.94
Hypothetical completed fertility rate (HCFR)	1.90	1.88	1.94

Source: Data set Male Reproductive Behaviour 2011; authors' calculations.

- 11) We also take into account conclusions by e.g. *Bumpass* (1984) and *Loomis and Landale* (1994) who claim that previous parity may play an important role in the woman's subsequent fertility behaviour, since it may reduce the probability of the woman conceiving another child if she already has two or more children from a previous relationship.
- 12) Divorced men who remarry are in most of the cases older than their female partners. For example, in 2011 20% of all remarried men were on average 10–14 years older than their female partners (and about 20% of them 7–9 years older than women). On the other hand, 17% of all women who remarried were on average one year older than their husbands (and about the same proportion were 5–6 years older) – data from *Demografická ročenka ČR 2011*.
- 13) One would think that the number of stepchildren might influence the level of the completed fertility rate. However, only 2.7% of all women aged 40+ are stepmothers, while 7% of all men in our sample have step-children.

socialism'. Although it might therefore seem that it is not necessary to concern ourselves with the issue of male reproductive behaviour, we would not agree with such a conclusion. We are convinced that these analyses are meaningful – at the very least because we now know more about male fertility than we did before conducting our survey. The small differences found could be attributed to a cohort effect, since we surveyed the generation of respondents born in the period 1956–1971 whose reproductive patterns were rooted in the conditions of the old (that is socialist) demographic regime, with all its peculiarities.¹⁴ If we continue to study male reproduction and if we examine different cohorts, we can expect to witness very interesting diachronic developments brought about by the differentiation and individualisation of lifestyles of subsequent generations.

3.2 Family size preferences – the ideal and reality

In their pursuit to understand fertility rates, researchers increasingly believe that it is necessary to also explore individual preferences, motivations and intentions, as these are important predictors affecting, at the individual level (and also in the aggregate form of the total fertility rate), the final number of children men and women have. Preferences, motivations and intentions are part of a person's individual social and psychological profile, but they are also contextdependent – e.g. related to a person's situation in terms of economic circumstances or success in the marriage/mating market, affected by social norms (and stereotypes) and so on.

Demographers and sociologists have therefore introduced further indicators, which help reveal various aspects of fertility and reproductive behaviour: the ideal number of children, the preferred number of children, the intended/expected number of children and the desired number of children, in order to pinpoint the mechanisms that ultimately determine the final number of children men and women have. *Miller and Pasta* (1995a, 1995b) and *Miller* (1994) claim, for example, that the desired and intended number of children are key concepts for understand-

ing, and therefore also for predicting, fertility rates and family size. They uphold the opinion that a distinction needs to be made between desires/preferences and intentions: desires/preferences are an expression of what people want to do, while intentions refer to what people plan to do. Desires/preferences are underlined by attitudes, beliefs and motivations. Consequently, they propose that distinct indicators should be constructed for each of these categories.

In our survey, we used the variable 'ideal number of children'. As is generally known, what this variable actually measures sensitively depends on how the question is formulated and phrased. It may indeed be formulated at the individual level (the number of children the respondent would desire to have under ideal life conditions) or at a general societal level (the ideal number of children in general). Multiple surveys have shown what we suspected, that the reported ideal number of children at a general level is higher on average than the reported ideal number at the individual level. In addition, it has repeatedly been shown that there exists a distinction between the ideal number of children, the intended number of children and the actual number of children. *Van Peer* (2002) and *van Peer and Rabušić* (2008) have confirmed that the individual norm governing the number of children is set lower than the general norm and that the actual (realised) fertility level is below what is considered ideal at the individual level.

Let us now examine our survey findings on male reproductive fertility from the point of view of the ideal number of children. The questionnaire asked about the ideal number of children at both the individual and the general societal level. The ideal number of children at the individual level was assessed using the question: 'If circumstances in your life were entirely favourable how many children would you like to have in total?' The ideal number of children at the general societal level was measured using the question: 'What do you think is the ideal number of children in a family?' These questions were asked separately from each other during the interview to avoid the so-called 'halo effect', whereby an answer

14) As regards the family, it means the discourse establishing the family as the basis of the state and the social pressure on people to have children.

Table 2 Percentage distribution of respondents according to the ideal and the actual number of children (all respondents – N=2,500)

Number of children (% Col)	Social ideal		Individual ideal		Actual number of children	
	Males	Females	Males	Females	Males	Females
No child	1.6	0.5	3.3	0.9	16.3	10.7
1 child	13.4	9.2	14.5	9.9	16.5	18.0
2 children	69.9	73.9	58.2	61.9	49.3	53.1
3+ children	15.0	16.3	24.0	27.2	17.8	18.2
Average number of children	2.00	2.07	2.10	2.22	1.69	1.79

Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

Note: The societal ideal was indicated by the question: 'What do you think is the ideal number of children in a family?' The individual ideal was indicated by the question: 'And if circumstances in your life were entirely favourable how many children would you like to have in total?'

to one question influences the answer to the following question. The resulting percentage distribution of respondents according to number of children and fertility averages for each indicator are presented in Table 2.

It has again been confirmed that the perceived individual and the societal ideal concerning the number of children are on average higher than the actual average number of children (see the last row in Table 2). The disparity between the two ideal numbers and the reality is particularly marked in the case of childlessness. Being childless is almost never seen as an ideal (the value ranges between 1% and 3%), while the reality is many times higher (16% in the case of men and 11% in the case of women). The one-child ideal points to interesting results: while it is viewed as a societal and individual ideal by 13% and 15% of men, respectively, and by 9% and 10% of women, respectively, the reality is different, particularly in the case of women: 18% of women stopped at one child, which is almost double the ideal number, and so did 17% of men – here the ideal only slightly differs from the reality. This finding further confirms our prognosis, formulated in 2007, that the proportion of women with only one child (that is their final number of children) will stand at about 20–25% around the years 2020–2025 (for more details see *Rabušic – Chromková Manea* (2007), where arguments supporting this prognosis are presented).

Considerable differences can also be seen in the case of the two-child model. Two children are largely regarded – by 70% of men and 74% of women

– as a general societal ideal (that is as an ideal number of children in a family). At the individual level, the preference for two children is much weaker: expressed by 58% of men and 62% of women. The reality is quite different, even below the level of individual preferences: 49% of men and 53% of women ultimately had two children (the difference between the proportions of the actual and the ideal number of children is statistically significant).

Variations between the real number of children and the ideal number of children at both the individual and the societal level are also found for the model 3+ children. This model is chosen to be ideal at the individual level by 24% of all men, respectively 27% of women, while only 15% of all men and 16% of all women consider it to be ideal at the general social level. On the other hand, only approximately 18% of men and women have 3 or more children.

As Table 2 shows, in many cases the real number of children is lower than the ideal, desired number. There is a variety of reasons why the declared ideal numbers concerning family size differ from the actual family size: postponing marriage or partnership (and hence conception) until a later age, career as a life priority, economic circumstances, the health condition of one or both partners, and divorce. Also, conflicting preferences between the spouses (partners) concerning the number of children may play a role.¹⁵⁾ Last but not least, the Czech social climate that 'prefers' the two-child model might put some pressure on those who prefer more than two children.

15) For details on couple dynamics and its impact on fertility, see *Chromková Manea – Fučík*, 2007.

3.3. Variables in the context of male fertility

What are the characteristics men possess that determine their completed fertility rate, on the one hand, and their views of the ideal number of children, on the other hand? Since our study is essentially an exploratory analysis – inasmuch as the research topic is new – we do not test any deductively derived hypotheses and we will begin with a simple bivariate description. We will ask to what extent the basic characteristics of age, family status, education and level of religiosity influence the variability of the dependent variables – completed fertility rate, the ideal number of children at the individual level and the ideal number of children at the general societal level. Inspired by *Catherine Hakim's* (2000) preference theory, we have added a synthetic indicator measuring preferences for work and family, which should be a significant covariate of fertility behaviour.¹⁶⁾

The results of bivariate analysis including the correlation coefficients presented in Table 3 (see the columns referring to male respondents) show that the impact of the selected characteristics of the male respondents (except age, all are in the form of categorical variables) on their completed fertility rates, and the perceived ideal number of children at the individual, as well as the general societal level, is for the most part very weak or none at all. Older male respondents have on average a higher completed fertility rate than younger ones, as well as a higher ideal number of children at the individual and societal levels. Nevertheless, certain categories of independent variables did show some correlation. This applies to family status, where those male respondents who were single had a significantly lower completed fertility rate than the others (having on average 0.29 children). The ideal number of children for single men was also considerably lower in comparison with the other family status categories for men. Clearly, this is also true for education, where a downward linear trend is apparent in Table 3, where the highest completed fertility rate as well as the ideal number of children, regardless of the level of measurement, is found among men with primary education, whereas at the opposite pole are men with university

education, who have on average the lowest completed fertility rate and ideal number of children. Indeed, the Kendall's Tau coefficient of association between completed education and the completed fertility rate was -0.50 (sig. < 0.05) for men, while between completed education and the ideal number of children at the individual level was -0.45 (sig. = 0.11) for men too. However, the effect of education on views about the ideal number of children is statistically insignificant – except for male respondents with primary school education who differed from the others in terms of the ideal number of children they would like to have, if circumstances were ideal: the average was 2.58, which is the highest value of all the characteristics shown in Table 3. No differences were found – and this is a surprise – in relation to religious beliefs: be it in terms of the male actual number of children (measured as the completed fertility rate) or their perceptions of the ideal number of children. The 'preference theory' variable fulfilled, to some extent, its function as a distinguishing feature for the male population. The work-centred men have – in line with Hakim's theory – a significantly lower completed fertility rate as compared to other preference typology categories. Work-centred men also stated the lowest values when answering the questions about the ideal number of children at both the individual and societal levels. As for the measurement of association between preference typology and the dependent variables (real and ideal number of children), the levels of association as measured by the Gamma coefficient come close to zero (-0.03) and are statistically insignificant in the case of all the three dependent variables.

The following part of the paper will focus on the results for women (see the columns referring to female respondents in Table 3). As was the case with men, women of a younger age (40–47 years) have a lower completed fertility rate and ideal number of children than older age category. And similarly to their male counterparts, single female respondents showed lower values than respondents in the other family status categories in terms of their completed fertility rate (on average 0.39 children) and perceptions of the ideal number of children (on average 1.68

16) As regards the family, it means the discourse establishing the family as the basis of the state and the social pressure on people to have children.

Table 3 Average number of children (completed fertility rate), average ideal number of children at the individual level and average ideal number of children at the general societal level by selected characteristics, coefficients of association – males aged 40–55, females aged 40+, in 2011 (N=1,251 for males, N=1,070 for females)

	Completed fertility rate		Ideal number of children at the individual level		Ideal number of children at the general societal level	
	Males	Females	Males	Females	Males	Females
Age group						
Pearson coefficient (sig. level)¹⁷⁾	0.112 (sig.<0.00)	0.078 (sig.<0.01)	0.083 (sig.<0.00)	0.081 (sig.<0.01)	0.098 (sig.<0.00)	0.084 (sig.<0.01)
40–47	1.65	1.82	2.09	2.22	1.99	2.10
48+	1.85	1.94	2.11	2.33	2.09	2.14
Family status						
Eta coefficient (sig. level)	0.530	0.403	0.294	0.156	0.259	0.201
Married	1.98	2.01	2.22	2.31	2.08	2.15
Widowed	1.91	2.06	2.25	2.32	2.13	2.14
Divorced	1.87	1.84	2.16	2.30	2.04	2.09
Single	0.29	0.39	1.41	1.68	1.65	1.77
Completed education						
Kendall tau coefficient (sig. level)	-0.500 (sig.<0.05)	-0.114 (sig.<0.00)	-0.450 (sig.<0.11)	-0.179 (sig.<0.00)	-0.004 (sig.<0.89)	-0.115 (sig.<0.00)
Primary	2.23	2.54	2.58	3.03	2.13	2.30
Lower secondary / vocational	1.78	1.93	2.19	2.35	2.03	2.19
Upper secondary	1.74	1.84	2.11	2.20	2.04	2.08
University	1.59	1.64	2.10	2.09	2.05	2.04
Religious belief						
Eta coefficient (sig. level)	0.050	0.102	0.132	0.172	0.123	0.169
Religious person	1.85	2.03	2.34	2.49	2.16	2.27
Not a religious person	1.72	1.82	2.10	2.17	2.00	2.06
Preference typology¹⁸⁾						
Gamma coefficient (sig. level)	-0.030 (sig.<0.49)	0.205 (sig.<0.00)	-0.038 (sig.<0.43)	0.143 (sig.<0.05)	0.025 (sig.<0.64)	0.140 (sig.<0.01)
Work-centred	1.34	1.20	1.74	1.81	1.77	1.85
Adaptive	2.01	1.88	2.28	2.22	2.09	2.09
Family-centred	2.06	2.11	2.25	2.37	2.15	2.19
Inconsistent (ambivalent)	1.43	1.68	1.85	2.04	1.73	1.93

Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

Note: The level of religiousness was assessed using the question: 'Irrespective of whether you go to church or not, would you say you are a religious person, not a religious person or a convinced atheist?'

and 1.77, respectively). Also in the case of female respondents, there are differences between women with different levels of completed education, where primary educated women have on average the highest completed fertility level (on average 2.54 children)

and the highest ideal number of children at both the individual and societal levels (the highest value is observed for the ideal number of children at individual level, where women with primary education reported on average 3 children). Female respondents

17) To find the bivariate correlation between age and the three dependent variables, we used 'age' measured at the interval level.

with higher education levels did not significantly differ. However, the value of the association coefficient between completed education and the completed fertility rate is much weaker for women than it is for men (Kendall's Tau for females = -0.11, sig. 0.00). Similarly to men, female respondents who considered themselves religious did not differ from those who did not, in terms of their completed number of children. However, if conditions were ideal, religious women would desire to have more children than women who are not religious (2.49 : 2.17; the t-test showed, however, that this difference is not statistically significant). The typology based on the preference theory showed a more pronounced effect in the case of women than it did in the case of men: work-centred women had a much lower completed fertility rate (1.20) than any other category, while women oriented towards family had on average the highest level of completed fertility rate (2.11). It is worth mentioning that adaptive and family-centred women are quite close in their preferences for the ideal number of children at both the individual and societal levels.

Further on, the variables in Table 3 were put into a multiple linear regression analysis to find out the net effects of predictor variables (those in rows) to outcome variables (those in columns). The results are presented in Tables 4a and 4b, where the standardised beta coefficients are presented for men and women separately.¹⁹⁾ The outcome (dependent

variables – completed fertility rate, the ideal number of children at the individual level and the ideal number of children at the general societal level – are all measured at the interval level; the predictor (independent) variables other than the interval (continuous) ones, were entered as dummies.

The covariates included in our analysis were as follows:

- Age of respondent – continuous variable, respondents aged 40+
- Marital status – categorical variable, where 1 means married, 2 widowed, 3 cohabiting, 4 single – recorded into 3 dichotomous/dummy variables and using a reference coding scheme with 'single' as the reference.
- Educational level – categorical variable, where 1 means primary education (ISCED level 1 and 2), 2 is lower secondary/vocational education (ISCED 3B and 3C), 3 stands for upper secondary education (with GCSE – ISCED level 3A), and 4 is for completed university/tertiary education (ISCED level 5A, 5B or 6) – recorded into 3 dichotomous/dummies variables and using a reference coding scheme with 'university education' as reference.
- Religion – dichotomous variable coded as 1 'religious' and 2 'not religious'
- Preference typology – categorical variable, where 1 means work-oriented, 2 adaptive, 3 family-oriented and 4 inconsistent – recorded into 3 dichotomous/

18) Categories of the preference typology: work-centred, adaptive, family-centred and inconsistent (ambivalent). These categories were constructed based on two questions: (1) There has been much debate lately about the changing traditional roles of a man and a woman in the family. I will now present to you six models of the family. Which of them corresponds best with your own ideas about an ideal family arrangement? (see appendix – models, first column), and (2) There are many ways in which people can organise their lives in terms of starting a family with children, having a job, pursuing a career and pursuing hobbies. Let me give four examples. Which of them comes closest to your own views? We coded as 'committed to work' those respondents who chose the answer 'Most important for me is work – to this I subordinate my family life as well as hobbies and interests.' Those who answered 'Most important for me is to have a family and children – to this I subordinate my work as well as my hobbies and interests' are coded as 'committed to family'. 'Adaptive' are respondents who answered 'Both family and work are important for me, so I try to reconcile them'. Respondents were also offered a fourth option: 'My interests and hobbies are most important for me, so I prefer them to the family and work'. We recoded these answers as 'committed to work' because quite often personal hobbies and work are correlated, and preferences of hobbies instead of family indicate work orientations (for more information on the preference typology, see *Chromková Manea – Rabušic* – forthcoming in October 2013, in *Crespi, I. – Miller, T. (eds.) 'Family, Care and Work in Europe: Gender Issues'*).

19) We use standardised beta coefficients for interpretation as *b* coefficients are measured in different units and the effects of the various independent variables cannot be compared otherwise.

dummies variables and using a reference coding scheme with ‘inconsistent’ as reference.

The first model for the completed fertility rate has an R^2 of 0.195. This means that the predictor variables explain only 19.5% of the variation in the outcome variable. The p value for the F statistic is lower than 0.05 and it implies that at least one of the independent variables is a significant predictor of the completed fertility rate. Variable age is not a significant determinant of male completed fertility rate. All other variables do play statistically significant role, though. Being married or divorced have the strongest impact relative to the single respondents on the male completed fertility rate when controlling for other variables (0.575 and 0.520, respectively, sig. < 0.00). Religiousness, although statistically significant, has the lowest value for the standardised beta coefficient, which indicates a very weak impact of being religious on our dependent variable.

The second model aimed to determine the covariates having significant impact on the male ideal preferred number of children at the individual level

explains only 9% of the variance (R^2 is 0.087). We learn that the ideal number of children for men does not vary by age when all other variables are controlled for. As in the model for completed fertility rate, indicators for marital status are significant, but the value of the standardised beta coefficients is quite low (close to 0). As for completed education, it seems that primary education have a significant influence on the ideal preferred number of children compared to university education when other covariates are controlled for. However, the beta coefficient is low. The same effect has religiousness. As far as the preference typology is concerned, the results come to confirm that being oriented towards work as compared to being inconsistent (ambivalent) decreases the ideal preferred number of children men would like to have when controlling for the rest of determinants included in the analysis. Being family-centred has no effect in this model, however.

The third model for the ideal preferred number of children at the general societal level has an even lower explanatory power than the previous two

Table 4a Multiple linear regression models for dependent variables completed fertility level, ideal number of children at the individual level and ideal number of children at the general societal level by selected socio-demographic characteristics, standardized beta coef. – male respondents aged 40–55 (N=1,251)

	Completed fertility		Ideal number of children at the individual level		Ideal number of children at the general societal level	
	Beta coef.	Sig.	Beta coef.	Sig.	Beta coef.	Sig.
Age	0.034	0.282	0.016	0.649	0.044	0.217
Family status (ref. cat. Single)						
Married	0.575	0.000	0.197	0.004	0.146	0.028
Widowed	0.173	0.000	0.077	0.042	0.074	0.053
Divorced	0.520	0.000	0.175	0.006	0.156	0.013
Completed education (ref. cat. University)						
Primary	0.156	0.000	0.113	0.002	0.038	0.302
Lower secondary / vocational	0.164	0.001	0.063	0.230	-0.029	0.585
Upper secondary	0.136	0.004	0.050	0.343	0.002	0.969
Religious belief (ref. cat. Not a religious person)						
Religious person	0.068	0.030	0.116	0.000	0.087	0.013
Preference typology (ref. cat. Inconsistent)						
Work-centred	-0.121	0.000	-0.183	0.001	-0.154	0.000
Adaptive	excluded		excluded		excluded	
Family-centred	0.022	0.509	-0.035	0.334	0.047	0.206
Nagelkerke R square	0.195		0.087		0.066	

Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

models (R^2 only 0.066). Marital status, religious belief and to some extent preference typology have a significant impact on the dependent variable, but the beta coefficients have a very low value (close to zero).

The next table (see Table 4b) presents the same regression analysis but for female respondents. The results are quite similar to the male ones for the completed fertility rate, where being married or divorced as compared to single increases the chances of having a higher realised fertility rate (beta coefficients above 0.5). As for men, lower levels of completed education for women seem to have a significant impact on female fertility rate when all other variables are controlled for, but the values of beta coefficient are low (close to 0). A similar effect is observed for religiousness. The same pattern can be found for the ideal desired number of children at the individual level, where beta coefficients for marital status, education, religiousness and additionally preference typology are statistically significant, but their value is low (close to 0).

As for the reported ideal number of children at the general societal level, the regression model for

women contains only two variables that are statistically significant, but again the beta coefficients are low: being married (as compared to being single) or being a religious person have a growing impact on the ideal desired number of children when all other variables are controlled for in the equation.

4. FINAL REMARKS AND DISCUSSION

This article presented new empirical data on male reproductive behaviour in the Czech Republic, building on our previously published overview paper on this topic. It examines the completed fertility rates of men and women, as well as their attitudes concerning the number of children, fertility intentions, and other determinants of fertility. As regards completed fertility, we have seen that men remain childless more often than women – this is particularly evident in the case of people living outside of marriage, even when in a stable relationship. Overall, the comparison showed only small differences between male and female fertility:

Table 4b Multiple linear regression models for dependent variables completed fertility level, ideal number of children at the individual level and ideal number of children at the general societal level by selected socio-demographic characteristics, standardised beta coef. – female respondents aged 40–55 (N=1,070)

	Completed fertility		Ideal number of children at the individual level		Ideal number of children at the general societal level	
	Beta coef.	Sig.	Beta coef.	Sig.	Beta coef.	Sig.
Age	-0.005	0.891	0.024	0.500	0.030	0.830
Family status (ref. cat. Single)						
Married	0.636	0.000	0.275	0.000	0.207	0.010
Widowed	0.258	0.000	0.091	0.044	0.056	0.227
Divorced	0.536	0.000	0.207	0.005	0.133	0.080
Completed education (ref. cat. University)						
Primary	0.157	0.000	0.203	0.000	0.054	0.186
Lower secondary / vocational	0.137	0.010	0.128	0.024	0.105	0.072
Upper secondary	0.055	0.303	0.025	0.665	-0.002	0.969
Religious belief (ref. cat. Not a religious person)						
Religious person	0.087	0.008	0.152	0.000	0.143	0.000
Preference typology (ref. cat. Inconsistent)						
Work-centred	-0.104	0.003	-0.070	0.064	-0.067	0.086
Adaptive	excluded		excluded		excluded	
Family-centred	0.063	0.110	0.069	0.061	0.072	0.055
Nagelkerke R square	0.183		0.119		0.070	

Source: Data set Male Reproductive Behaviour 2011; authors' calculations.

women had on average 1.84 children and men had 1.75 children. The number of children perceived to be ideal at the individual level is on average higher than what is perceived to be ideal at the general societal level. In comparing the ideal number of children to the actual number we can see that the ideal is not being lived out in the case of people who are childless or have only one child – there were many more respondents with no or only one child than the expressed ideal would suggest. It follows that the decision not to have a child or to have only one is not necessarily made in advance. By the same token, there were fewer respondents with two children than would be expected given the declared ideal.

We also examined the possible effects of basic socio-demographic characteristics such as the respondent's age, family status, education, and religiousness, as well as the possible impact of a synthetic indicator measuring work and family-related preferences. For the most part, the influence of the independent variables has proven to be very weak or none at all. Single respondents had a markedly lower completed fertility than the others and their subjective ideal number of children was also significantly lower than was the case with the other family status

categories. Religiosity has no effect on either completed fertility or the ideal of the number of children. The indicator 'work and family-related preferences' has revealed some partial effects in the group of work-centred men who have both a lower completed fertility rate and who regard as ideal a smaller number of children. The female sample showed similar results. Our data captures reproductive behaviour of people born between 1956 and 1971 that is in the period of the old, so-called socialist, demographic regime with largely homogenised living conditions. The differentiation of lifestyles of the ensuing generations that we have been witnessing is likely to produce greater variation. This survey is only the first step and will be followed by further research: for example, we intend to analyse the timing of life events in relation to male reproduction. We will also seek to explore the phenomenon described as 'baby fever' in international literature (see e.g. *Rotkirch – Basten, 2012*) to see whether it is present in the Czech population – specifically the male population – and what possible effect it has on the completed male fertility level. We also plan to analyse the role that men have in sexual activities and the use of contraceptives, as this is also an influential attribute of male reproductive behaviour.

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Appendix

Table 5 Main sample distribution

	N – absolute values	% col
Gender		
Male	1,251	50.0
Female	1,249	50.0
Age		
20–39 ²⁰⁾	153	6.1
40–47	1,198	47.9
48+ ²¹⁾	1,142	45.7
Marital status		
Married	1,764	70.6
Widowed	47	1.9
Divorced, separated	420	16.8
Single	245	9.8
Completed education		
Primary	77	3.1
Lower secondary / vocational	970	38.8
Upper secondary	1,110	44.4
University	333	13.3
Size of residence		
up to 2,000 inhabitants	472	18.9
2,000–4,999	412	16.5
5,000–9,999	312	12.5
10,000–19,999	261	10.4
20,000–49,999	264	10.6
50,000–99,999	213	8.5
100,000–499,999	111	4.4
500,000 and more inhabitants	455	18.2

Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

20) All respondents in the age group 20–39 are women.

21) Men only up to 55.

Table 6 Typological scheme of lifestyle preferences

	A. Committed to work	B. Adaptive	C. Committed to family
1) A family where the two partners each have an equally demanding job and where housework and the care of the children are shared equally between them	Work-oriented	Adaptive	Adaptive
2) A family where the wife has a less demanding job than her husband and where she does the larger share of housework and caring for the children	Inconsistent	Adaptive	Family-oriented
3) A family where the wife has a more demanding job than her husband and where she does the larger share of housework and caring for the children	Work-oriented	Adaptive	Inconsistent
4) A family where only the husband has a job and the wife runs the home	Inconsistent	Family-oriented	Family-oriented
5) A family where the two partners each have an equally demanding job and where woman does the larger share of housework and caring for the children	Work-oriented	Adaptive	Family-oriented
6) A family where only the husband has a job and where housework and the care of the children are shared equally between them	Inconsistent	Family-oriented	Family-oriented

Source: Data set *Male Reproductive Behaviour 2011*; authors' calculations.

HOW MANY FOREIGNERS FROM THIRD COUNTRIES ARE IN FACT WORKING IN THE CZECH REPUBLIC? THE CASE OF UKRAINIAN, VIETNAMESE AND MONGOLIAN WORK PERMIT HOLDERS

Soňa Schovánková¹⁾

ABSTRACT

The aim of this contribution is to find out whether selected officially published statistical data on third country employees reflect their real volume in the Czech Republic. The author presents an analysis of various indicators of the employment activities of foreigners in the Czech Republic and applies them to the three largest groups of third country employees – Ukrainians, Vietnamese and Mongolians.

Keywords: labour migration, indicators of migration, employment of foreigners, Ukraine, Vietnam, Mongolia

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1. INTRODUCTION

The flow and volume of international labour migration²⁾ are a current issue that has figured prominently on the radar of researchers, policy makers and international organisations³⁾ for several decades. This topic is often kept visible by fears that migration poses a threat to host countries (Willekens, 1993). The opposite view is that labour migration helps to grease the wheels of the economy, as job migrants move in response to different economic opportunities (Borjas, 2001)

and reflect the needs of employers in host countries for workers with certain skills. International labour migration is also closely linked to other areas in the life of society. The topic of ‘replacement migration’ is currently often discussed in demography (Burcin – Drbohlav – Kučera, 2008), the cultural sphere, and politics, as destination countries regulate the flow and stock of people while trying to strike a balance between employers’ needs, the local labour force, and national interests (see, e.g., Davis – Hart, 2010; Khoo – Hugo – McDonald, 2010; Khoo – McDonald – Voigt-Graf – Hugo, 2007).

1) Geomigration Center, Department of Social Geography and Regional Development, Faculty of Science, Charles University in Prague.

2) Unless specified otherwise, we define labour migration as the migration of workers, i.e. both employees and entrepreneurs.

3) Such as the United Nations (UN), the International Organization for Migration (IOM), the Organization for Economic Cooperation and Development (OECD), the Council of Europe (CE), the European Union (EU) and the International Labour Organization (‘ILO’).

The areas mentioned above are all closely interconnected and their relative importance with respect to migration varies depending on the political, social and economic situation of the country. In this respect, it is possible to identify five periods of international migration to the Czech Republic since the early 1990s (Baršová – Barša, 2005; Kušniráková – Čížinský, 2011; Drbohlav *et al.*, 2010): (1) The very first, and rather liberal, regulations on the entry and residence of foreigners in the Czech Republic were formulated and applied from 1990 to 1995; the new legislation imposed no limits on and just monitored migration flows (2) The liberal approach of the early 1990s was followed by a more restrictive period between 1996 and 1999, as the country began working to fulfil the requirements for accession the European Union, and in response to an economic crisis at that time. (3) The period of 2000–2004 can be described as the institutional period, when the government adopted the principles of the Czech migration policy, which have formed the basis of the state's immigration policy up to the present day. In addition, new immigration legislation was adopted, which, though amended several times, remains in effect to date. (4) The neoliberal period of 2005–2008 was characterised by an economic boom and a local labour force shortage that was supplemented by labour from abroad. (5) The most recent period started in 2008, coinciding with the start of the current economic crisis, and can be labelled the 'neorestrictive' period, characterised by the efforts of government authorities to limit the inflow and number of foreigner labour migrants⁴⁾ from so-called third countries,⁵⁾ hoping that the jobs they had been filling will be taken over by Czechs or by workers from the European Economic Area (EEA)⁶⁾ or Swiss workers who can enter the Czech labour market freely under the same conditions as Czechs. Nevertheless, during this period two instruments of immigration policy came into force that were to make the Czech Republic more attractive to foreign labour – Green Cards and Blue Cards.⁷⁾

Accurate indicators of the number of labour migrants residing in the Czech Republic and of their structure and the factors that determine their movements can help to provide a better understanding of this phenomenon, to regulate/monitor it, and to predict future migration trends.

The aim of this article is to discuss whether officially published data on the employment of foreigners in the Czech Republic reflect the real number of foreigner employees who may have come to the Czech Republic for the purpose of employment and who actually reside and work in the Czech Republic. This article will focus primarily on statistics on migrant workers from Ukraine, Vietnam and Mongolia for the years between 2008 and 2011 who obtained work permits.

2. INTERNATIONAL MIGRATION DATA AND THE CURRENT LITERATURE

This section will begin by setting labour migration statistics in the wider context of the data collection performed by international organisations and the difficulties of data comparability between countries. It will also present the available sources of information on labour migration data in the Czech Republic. This broader framework should help the reader to better understand the importance of relevant Czech statistics on labour migration and will also serve as the basis for a more detailed specification of the aims and structure of the article.

National data on migrants and labour migrants are usually very difficult to compare between countries given the different national systems for classifying migrants, each based on the given country's legislative background, history, political needs, administrative structures and procedures and national interests. In this respect, in *Worlds in Motion* (1998: 110) Massey *et al.* admit that 'measuring the stocks and flows of immigrants [in Europe] is especially difficult because no two countries use

4) The Czech authorities define a foreigner as any individual with other than Czech citizenship (not holding a Czech passport).

5) Third countries are countries outside the EU/ European Economic Area, not including Switzerland.

6) EEA refers to the European Economic Area, i.e. EU countries, Norway and Iceland.

7) Both of these instruments will be discussed in Section 4.

the same categorization of origin nations'. They also see a problem in the different approaches countries take 'to rules of citizenship and naturalization, which determine who gets counted as an "immigrant"'.⁸⁾

Significant problems with the compatibility of statistics on migration are one reason why there is no regular systematic collection of the latest labour migration data by any international organisation. The ILO currently runs the International Labour Migration Statistics website, which is designed to provide general data on foreign workers in every country in the world. However, it seems that this ambitious project is currently unable to fulfil its aim as the data are not regularly updated (ILO, 2012). For the period 2008 – 2011 the OECD published. Information on employment, unemployment and participation rates by gender and place of birth in member states quarterly. Some attempts to systematically collect data on labour migration flows were also made by the EU in the last decades of the 20th century, but it proved very difficult to collect the statistics and the information was very inaccurate (Salt – Clarke – Wanner, 2004; Willekens, 1993). Currently, statistics on international labour migration in the EU is managed by Eurostat, the EU's statistical office, which is annually provided with the data it needs from the national statistical authorities of each Member State⁸⁾ (Eurostat, 2012).

As regards the Czech Republic, in 2010 the Czech Statistical Office (CZSO) drew up the 'Concept of Selection and Processing of Statistical Data Connected to Migration and Integration of Foreigners on the Territory of the Czech Republic' (CZSO, 2010). This document was drafted in response to a government decision and as supporting documentation for EU authorities that work on identifying internationally comparable data sets on migration and integration. It describes the nature and source of the available data on labour migration. It also points out discrepancies between what statistics on labour migration refer to

(i.e. the number of work permits or trade licences issued, or the number of foreign nationals registered at labour offices in the country, etc.) and clarifies differences between various purposes of residence of foreigners in the Czech Republic (e.g. work, family reunion, study, asylum). Another document on collection systems and practices of statistical data on foreigners in the Czech Republic was worked out by Drbohlav and Lachmanová-Medová (2009) as part of a project called Prominostat. The aim of the project was to raise awareness about the availability of migration data in all EU countries and to enhance the understanding of accessible indicators.

The Czech authorities currently publish two publications annually on the employment activity of third-country foreigners in the Czech Republic. The first is a bulletin issued by the Research Institute for Labour and Social Affairs (RILSA). This publication is often used as a data source for research on international labour migration in the Czech Republic (see Horáková, 2007, 2008, 2010b; Plewa, 2012; Trbola – Rákoczyová, 2010), though the data are not defined nor their accuracy specified in any detail. The bulletin contains clearly presented data, in the form of tables, on the number of work permits and Green and Blue Cards issued by the Czech authorities and on the number of foreign nationals registered at labour offices etc. The data come from the official databases of the Ministry of Labour and Social Affairs (MoLSA), the Ministry of Interior (MOI), the Ministry of Foreign Affairs (MFA), the Alien Police (AP), the CZSO, and other sources. Statistics are available according to citizenship or region or in a time series.

The second annual publication is 'Cizinci v ČR' (Foreigners in the CR) (see e.g. CZSO, 2012b), which presents information on, for example, changes in the number of foreigners working in the Czech Republic over the preceding year. MoLSA, MOI, AP, CZSO, etc., are the sources of these data. Even though the document provides interesting results,

8) Compulsory provision of certain data by countries was instituted in 2008, in conformity with Regulation 862/2007, which also defines a core set of indicators on international migration flows and stocks and other indicators relating to foreign residents. Even though Member States use various data sources, such as registers of work permits, residence permits, non-nationals etc., this regulation is the first attempt to improve the availability and comparability of EU migration statistics (Eurostat, 2012).

it is not clear what data are actually used as explanations of the data are absent in this publication.

One of the aims of this article is to contribute to the general awareness of the differences between indicators on the employment of foreigners in the Czech Republic. Another focus is the officially published and broadly used statistics of the CZSO (2012a) and RILSA (see *Horáková – Macounová*, 2009, 2010a, 2011, 2012) on the number of work permits, Green and Blue Cards long-term employment visas and residence permits for the purpose of employment issued. These permits are usually interpreted as representing the number of foreigners working and residing in the Czech Republic. However, how far do these data reflect reality? This article will try to take a closer look at the data set of indicators on the employment of foreigners from selected third countries, namely, Ukraine, Mongolia and Vietnam,⁹⁾ who are required to have both a work permit and long-term employment visa or long-term residence permits for the purpose of employment in order to work in the Czech Republic.¹⁰⁾ This empirical study will focus on the neorestrictive period of the economic crisis between 2008 and 2011. First, I will estimate the number of new work-permit holders who may have arrived in the Czech Republic between 2008 and 2011. Second, I will discuss the number of work-permit holders who were in fact able to stay in the Czech Republic between 2008 and 2011 for the purpose of work.

Section 3 of this article will specify the main features and relevant authorities involved in regulating the employment of foreigners in the Czech Republic. Section 4 presents indicators on the employment of foreigners in the Czech Republic.

In Section 5, the number of new foreign workers who may have arrived in the Czech Republic between 2008 and 2011 will be estimated along with the total number of work-permit holders in the country. Both estimates will be made for all third-country employees as well as for Ukrainian, Vietnamese and Mongolian workers. The conclusion will sum up the article's main findings.

3. INTERNATIONAL LABOUR MIGRATION IN THE CZECH REPUBLIC

In order to understand the differences between the indicators on the employment of third-country foreigners in the Czech Republic, I shall first describe the basic rules and procedures that must be followed in order for a foreigner to obtain the necessary permits to work and reside in the Czech Republic, and I will also identify the relevant authority.¹¹⁾ In general, in order for third-country foreigners to work legally in the Czech Republic it is not enough for them to possess just a work permit or be registered at an labour office. They must also hold a valid visa or residence permit.¹²⁾ The labour offices and MoLSA are in charge of the agenda regulating the employment of foreigners, which includes the issuance of work permits and the registration of those employees who are exempt from the need to obtain a work permit. Generally, a third-country national, who does not yet reside in but wishes to move to the Czech Republic for the purpose of work, must contact an labour office in the Czech Republic before applying for a visa or long-term residence permit for the purpose of employment at the Czech embassy in that person's home country or country of the long-term residence.

9) Based on statistics published by MoLSA (2012a) the total number of work permits and Green and Blue cards issued as of 31. 12. 2008, Ukrainians, Mongolians and Vietnamese were the three countries whose nationals make up the three largest groups of work-permit holders in the CR (see also *Pořízek*, 2010).

10) Third-country workers need to obtain both a work permit and a visa or residence permit in order to work legally in the Czech Republic. Under certain conditions they may be exempt from the need for a work permit, but they must nonetheless register with the labour office. Nevertheless, a visa or residence permit is mandatory. The types of the documentation required by different groups of foreigners in order to work legally in the Czech Republic will be specified in the Section 4.

11) In this section, rules and responsible authorities are not applicable for obtaining Blue and Green Cards.

12) The indicators are explained in Section 4.

Third-country nationals must obtain a long-term employment visa or a long-term residence permit for the purpose of employment before coming to the Czech Republic. Accepting applications and issuing visas/residence permits is the shared responsibility of the MFA, which accepts applications and issues authorised visas/residence permits through Czech embassies¹³⁾ around the world, and the MOI, which processes the applications and decides whether to approve or reject the application. A work permit or registration with a labour office is typically required first in order to obtain a visa or a long-term residence permit for the purpose of employment. During the economic crisis that started in 2008 (when the neorestrictive period of international migration in the Czech Republic began) a restrictive immigration policy (e.g. the Visapoint system, which requires applicants to make an appointment with the embassy in order to submit an application for a visa or residence permit) was introduced to limit the inflow of foreigners from selected source countries, including Ukraine, Vietnam and Mongolia.

The AP becomes involved in the process after the individual arrives in the Czech Republic. Every foreigner is required to register his or her place of residence in the Czech Republic with the AP shortly after arriving in the country.

Last but not least, foreigners are required to submit an application for the renewal of their work or residence permit before it expires to the relevant authority. The renewal of work permits lies within the remit of the labour offices and the extension of long-term employment visas and long-term residence permits is the responsibility of the MOI. Both of these processes are carried out on the territory of the Czech Republic. (MFA, 2012; MOI, 2011a, b, c; *Residency*, 2012; *Zpráva*, 2012)

4. AN OVERVIEW OF THE INDICATORS RELATED TO THIRD-COUNTRY EMPLOYEES

In this section, I shall describe the indicators on the employment of third-country workers in the Czech Republic that are collected by government authorities (and some of these indicators will be used in the fourth section of this article).

Third-country employees are defined as those persons working in the Czech Republic who hold a passport from a country other than an EEA country or Switzerland. The main purpose of residence of these foreigners in the Czech Republic is employment,¹⁴⁾ so they hold a work permit and a long-term employment visa or a long-term residence permit for the purpose of employment.

Before specifying the various indicators on the employment of foreigners in the Czech Republic, I shall clarify what indicators are available in the Czech statistics. *Salt, Clarke and Wanner* (2004: 12) have pointed out that migration is: 'complex, dynamic and difficult to pin down' and so are its indicators. On the one hand, the data used here refer to the number of permits that had been valid as of a given point in time (a type of instantaneous indicator¹⁵⁾), i.e. as of 31. 12. of the given year. On the other hand, use is also made of other indicators that show how many permits were issued or registrations processed in a period of time (a sort of interval indicators¹⁶⁾), i.e. between 1. 1. and 31. 12. of the year.

4.1 Indicators of valid work permits

Permission to work in the Czech Republic means either possession of a work permit or, in the case of foreigners who do not require a work permit to work in the CR, registration at an labour office.

13) The consular agenda is carried out by Czech embassies and by Czech consulates general.

14) Pursuant to Act No. 435/2004 Coll., on Employment and Act No. 326/1999 Coll., on the Residence of Foreigners on the Territory of the Czech Republic.

15) Types of instantaneous indicator include work permits, first work permits, renewed work permits, the number of non-EU workers who do not need a work permit to work, long-term visas or long-term residence permits for the work purpose of stay issued by a Czech embassy /consulate, long-term visas and long-term residence permits, extended visas and residence permits for the purpose of employment, permanent residence permits.

16) Types of interval indicators include long-term visas or long-term residence permits for the purpose of employment issued by a Czech embassy consulate, registration of the place of residence of foreigners at the AP.

Data on the number of work permits that have been issued and the number of people registered at a labour office are maintained by MoLSA. MoLSA provides these data to the CZSO, which publishes them monthly, quarterly, or annually, and to RILSA, where Horáková and Macounová publish data in the Bulletin on International Labour Migration in the Czech Republic (see e.g. Horáková – Macounová, 2009, 2010a, 2011, 2012).

Publicly available statistics on employment usually include data on the number of **work permits** issued, which is the sum of the number of first work permits issued and the number of renewed work permits.¹⁷⁾ Below, both components of this indicator will be specified to provide a better picture of the different information that they provide.

In general, **first work permits**¹⁸⁾ are granted to individuals who meet requirements for the position and an employer's need to fill a vacant position (including qualifications, language skills, etc.).¹⁹⁾ Because a first work permit can in rare cases be issued to a foreigner who already resides in the Czech Republic for a purpose other than the purpose of employment, for instance, for the purpose of family reunion or business, variations between individuals' life situations was simplified by presuming that all holders of first work permits were residing in their country of origin and awaiting the necessary permits (not just the work permit but also a long-term employment visa or long-term residence permit for the purpose of employment) to be issued so that they could come to the Czech Republic for employment.²⁰⁾

The indicator of **renewed work permits** indicates how many work permits were issued for the second or more times to third-country employees already residing on the territory of the Czech Republic. These statistics are considered to be relatively complete and reliable, because when foreign workers apply

to renew their work permit they must present a copy of their valid visa or residence permit allowing them to reside in the Czech Republic to the authority they are applying to. Moreover, if the authority has doubts as to whether the individual has in fact been residing in the country, officials can ask the person's employer to submit, for instance, confirmation of an employee's registration with a health insurance company, thus proving the person's history of employment with the firm. In this article, statistics on renewed work permits as of 31. 12. of the given year are used.

The indicator of **third-country employees who do not need a work permit** to work (i.e. the number of third-country foreigners registered at the labour offices) in the Czech Republic applies to people who are family members of citizens of EEA countries and of Swiss citizens and to employees who are exempt from the need for a work permit according to § 98 of the Act on Employment. The exemption applies, for example, to holders of a permanent residence permit, students and graduate students, researchers and scientists, employees assigned to the Czech Republic for a short period of time or by an employer based in any other EU country, etc.

4.2 Indicators of issued visas, residence permits and processed registrations of place of residence

Statistics on residence permits and registrations of place of residence are collected by the AP, which passes these data on to other authorities such as CZSO and RILSA to publish.

Available statistics on **long-term visas and long-term residence permits** published by CZSO (2012a) and RILSA in the bulletin by Horáková and Macounová (see, e.g., 2009, 2010a, 2011 and 2012) do not distinguish between the various purposes of residence (employment, family, study, business, etc.), or the type of permit issued by a Czech embassy (a long-term

17) Indicators are available by month or by year, nationality, region, gender and job position.

18) In this case there is no record of the individual in the system of the labour offices or MoLSA until the individual applied for the first work permit.

19) Assuming that no Czech citizen, or citizen from an EEA country or Switzerland, or a registered unemployed Czech citizen was able or willing to fill the position under the conditions set by the employer.

20) PwC (*Background*, 2012) estimates that about 2–5% of the first work permits are granted to foreigners already residing in the Czech Republic.

visa or a long-term residence permit) and or issued on the territory of the Czech Republic. In this respect, when using these statistics to analyse labour migration, it is first necessary to fully understand what information these data provide.

Data on **long-term employment visas or long-term residence permits issued by Czech embassies** are available from the AP on request. The disadvantage of these statistics is that data are not available by citizenship of those who collected their permits. Nevertheless, thanks to a Government Decree (2010),²¹ it can be presumed that the absolute majority of individuals who collected their visas and residence permits from the Czech Embassy in Ukraine were Ukrainians, that the visas and residence permits issued by the Czech Embassy in Hanoi were collected mainly by Vietnamese, and those issued by the Czech Embassy in Ulaanbaatar were collected by Mongolians (see also Jelínková – Mikušková – Trlifajová, 2011). Moreover, the issuance of the long-term employment visa or long-term residence permit for the purpose of employment is determined by a valid work permit.

Another available statistic is the number of **extended long-term employment visas and long-term residence permits for the purpose of employment**. These data can be obtained from the AP on request and indicate the number of individuals who already reside in the Czech Republic and whose main purpose of residence is employment.²² These statistics can be considered to be complete, as visa or residence permits can be extended only when the individual is present in the Czech Republic.

A **permanent residence permit** is usually granted to foreigners who have resided in the Czech Republic for more than five years. In this case the purpose of residence (e.g. working, business, study) is not specified for this indicator, so it cannot be used

to analyse the number of working migrants with this type of the permit.

Finally, there is the indicator on the number of foreigners who fulfilled their post-arrival duty and **registered their place of residence** with the AP. These statistics can be obtained from the AP on request and are available on holders of long-term employment visas by year of registration, citizenship and region of residence in the Czech Republic. However the data are of questionable quality. Even though individuals are required to register within three working days of arriving in the country, they often do not do this until they need to submit their visa or residence permit extension applications. The reason is that after arriving visa or residence permit registration with the AP must be done before an application to extend a visa or residence permit can be submitted to the MOI (*Background*, 2012). Therefore it is expected that the available data provide an overview of the number of working individuals who in fact arrived in the Czech Republic between 2008 and 2011 and registered their visa or residence permit. However, as of 2011, the data may be incomplete owing to the belated registrations of employees who collected their visa or residence permit from the embassy in 2011 and arrived in the Czech Republic in 2011, but registered their place of residence in 2012.

4.3 Dual permits

Since January 2009, citizens of selected third countries, including Ukraine, Mongolia and Vietnam, can apply for so-called **Green Cards**, which is a work permit and long-term residence permit in one document. The Green Card is a project of the Czech Republic and its aim was to enable third-country foreigners to enter the Czech Republic for the purpose

21) In 2010 a list of countries whose citizens can apply for their visas and residence permits at a Czech embassy/consulate in a country other than the one from which they hold a passport or where they reside was introduced. This list of countries is identical with the list of visa waiver countries and includes citizens of the US, Canada, Japan, Korea, Malaysia, Australia etc. (Governmental Decree, 2010; MFA, 2012). Consequently, third-country nationals who need to hold a valid visa or residence permit every time they enter the Schengen area can apply for a Czech visa or residence permit only at the Czech embassy/consulate in their home country or country of their long-term residence. This requirement applies also to citizens of Ukraine, Vietnam and Mongolia.

22) Individuals can either hold a work permit or be registered with an labour office in conformity with Act No. 435/2004 Coll., on Employment.

of employment relatively quickly in order to meet the actual labour needs of employers (*MoLSA*, 2007).

Another dual document is the **Blue Card**, which was introduced in January 2011 and also provides permission to work and reside in one document. This is an EU project that is open to highly qualified third-country foreigners from all over the world, so that they can work and live in EU countries. Its aim is to increase the attractiveness of the region and to become more competitive with the US, Canada and Australia (*Černá*, 2010).

Data on Green and Blue Cards are collected by the MOI and are provided to the MoLSA as well as to CZSO and RILSA. Data are usually published as the sum of work permits and Green and Blue Cards issued.

In the last three years, about 150 Green and Blue Cards were granted. The very small number of these types of permits indicates that there is little interest among foreigners and employers to legalise a working stay in the Czech Republic through these permits. Therefore, these indicators will remain outside our interest and will be mentioned only briefly in the context of the total number of employees residing in the Czech Republic.

5 OFFICIALLY PUBLISHED STATISTICS ON THE NUMBER OF THIRD-COUNTRY FOREIGNERS WORKING IN THE CZECH REPUBLIC VERSUS REALITY

Despite the availability of a relatively large number of indicators on the employment of foreigners from third countries, I will only use indicators that can help us to compare officially published statistics and my estimates of the number of third-country employees new and really residing in the Czech Republic between 2008 and 2011.

5.1 New work-permit holders from third countries who may have arrived in the Czech Republic between 2008 and 2011

Czech statistics unfortunately do not provide an indicator of new third-country employees who arrived in the country during the observed period. Nevertheless, based on the characteristics of Czech international migration as specified in Section 3, I estimated

the volume of these new migrants using the following indicators (for their specification see Section 4):

- First work permits
- Long-term employment visas issued by Czech embassies
- Long-term residence permits for the purpose of employment issued by Czech embassies
- Registrations with the AP of the place of the residence of holders of long-term employment visas

Before explaining the data, it is necessary to stress the specific relationship between indicators and some of their limitations. A long-term employment visa or long-term residence permit for the purpose of employment is issued on the basis of a valid first work permit. In this respect, it is expected that the number of first work permits issued will be slightly higher than the number of long-term visas/long-term residence permits issued. Moreover, in the case of individuals who collected their long-term visas/long-term residence permits in the end of the calendar year, they may have arrived in the Czech Republic the following year, so the registration of place of residence with the AP could have taken place the following year.

It is obvious from the available data (Table 1, part "A") that all the indicators had a primarily decreasing tendency between 2008 and 2011. While in 2008 more than 92,500 first work permits were issued in total, in 2007 the figure was more than seven times lower (the total number of first work permits in 2001 was about 12,600). The same trend can be observed when the number of first work permits is traced by nationality. About one half of all work permits issued between 2008 and 2011 were granted to Ukrainian citizens (estimated as the total number of first work permits minus first work permits issued to Ukrainians) who were about to be employed primarily in Prague and also Prague-East, Brno, Pardubice and Hradec Králové region. The number of first work permits issued to Mongolians in 2008 decreased from about thirteen thousands to approximately seven hundred in 2011. Most Mongolians obtained their first work permits for Prague, Brno, Pardubice and also Blansko, Litoměřice and Česká Lípa regions. The decrease in the number of first work permits issued to Vietnamese was from about ten thousand in 2008 to 279 in 2011. The distribution of Vietnamese varied over time: while in 2008 and 2009 the highest

demand for new Vietnamese employees was in Pardubice and the Prague-East Region, in 2010 and 2011 it was in Pardubice, Hodonín and the Beroun region.

The total number of long-term employment visas or long-term residence permits for the purpose of employment issued by Czech embassies worldwide (Table 1, part 'B') continuously decreased from tens of thousands in 2008 to only several thousand in 2011. Moreover, Table 1 also indicates that foreigners usually preferred to apply for long-term employment visas over long-term residence permits for the purpose of employment.²³⁾ The Czech embassy and consulates in Ukraine issued about 11,400 long-term employment visas and about 10,400 of long-term residence permits for the purpose of employment in 2008. The number decreased the following year and about 3,500 of each of these permits were issued. In 2010 and 2011 there were only several hundred permits of each type issued

by the Czech embassy or by consulates in Ukraine. In 2008 about two thousand long-term employment visas and long-term residence permits for the purpose of employment were issued to Mongolians by the Czech embassy in Mongolia and in the following years less than 200 long-term employment visas and less than 50 long-term residence permits for the purpose of employment. Vietnamese significantly preferred to apply for long-term employment visas over long-term residence permits for the purpose of employment. Even though in 2008 there were several thousand Vietnamese who planned to go to the Czech Republic to work, in 2010 and 2011, there were almost only individuals who collected their long-term employment visas or long-term residence permits for the purpose of employment from the Czech embassy in Hanoi.

Moreover, the ratio of the number of first work permits issued (part 'A' of Table 1) and the sum of long-term

Table 1 Indicators of new employees, 2008–2011

Citizenship / Czech Embassy or Consulate in	First work permits ¹⁾				Long-term employment visas issued by Czech Embassies abroad ²⁾				Registrations of the place of the stay in the Czech Republic of holders of long-term employment visas with the Aliens' Police ³⁾			
					Long-term residence permits for the purpose of employment issued by Czech Embassies abroad ²⁾				Registrations of the place of the stay in the Czech Republic of holders of long-term residence permits for the purpose of employment with the Aliens' Police ³⁾			
	2008	2009	2010	2011	2008	2009	2010	2011	2008	2009	2010	2011
Ukraine	49,492	22,846	10,756	5,820	11,439	3,785	759	351	12,987	1,754	274	232
					10,440	3,229	233	130	N/A ⁴⁾	N/A	N/A	N/A
Vietnam	13,475	1,125	540	279	8,931	567	83	28	1,015	3	2	6
					151	3	2	5	N/A	N/A	N/A	N/A
Mongolia	9,778	1,906	1,201	713	2,720	173	117	52	2,111	29	26	24
					2,475	51	13	13	N/A	N/A	N/A	N/A
Third countries total ¹⁾	92,568	37,797	19,764	12,621	46,487	16,388	11,239	8,903	26,036	4,409	2,212	2,022
					25,675	6,880	2,084	1,910	N/A	N/A	N/A	N/A

Source: MLSA (2012); AP (2012).

Note: ¹⁾Non-EU total refers to all Czech Embassies / Consulates worldwide that issued long-term employment visas or long-term residence permits for the purpose of employment in that year.

²⁾ First work permits valid on 31 December.

³⁾ Long-term employment visas and long-term residence permits for the purpose of employment issued by Czech Embassies during the year.

⁴⁾ Registrations of the place of the stay in the Czech Republic carried out during the year.

⁵⁾ Statistics is not available.

23) This may be explained by the time it takes to process an application. It takes about 90 to 120 days to process a long-term visa application and up to 270 days to process an application for a long-term residence permit.

employment visas and long-term residence permits for the purpose of employment issued by Czech embassies abroad (part 'B' of Table 1) indicates that between 2009 and 2011, three to twelve times more first work permits were issued to Ukrainians than the number of visa/residence permits collected from the Czech embassy and consulates in Ukraine. In the case of Vietnamese, the ratio was 2 to 8 and in the case of Mongolians even 9 to 11 between 2009 and 2011. The indicator had an increasing tendency in all these cases. By contrast, from the perspective of third countries in total, the ratio was only 1.2 – 1.6 and depending on the year the trend was increasing or decreasing.

Data on registrations of the place of the residence are available for holders of long-term employment visas only and indicate the number of third-country workers who, in fact, did arrive in the Czech Republic and reported their place of residence at the AP. In 2008 the total number of new third-country workers who registered their place of residence was 26,036, which was about half of all long-term employment visas collected that year, and about 2,000 in 2011, moreover, one half of all of these employees were registered in Prague. While in 2008, there were new employee registrations of Ukrainians, Vietnamese and Mongolians in all the regions of the Czech Republic, their regional distribution varied in the following years as the number of new employees significantly decreased.

As for Ukrainians, based on available statistics there were almost 13,000 Ukrainian employees who registered their place of residence in 2008. This is slightly more than the number of long-term employment visas issued by embassies. This discrepancy was probably due to the fact that even though the visas were issued already in 2007, individuals could have registered their stay in the Czech Republic in 2008. With respect to regional distribution, in 2009 (Figure 1) Ukrainian employees were registered in all regions of the Czech Republic except for Opava, Vsetín, Prostějov, Cheb and Tachov regions. The following years, the number of regions where new employees registered their place of residence significantly decreased (Figures 2, 3) and so did the number of new Ukrainian employees. While in 2010 they (274 employees) resided mainly in re-

gions in central and eastern Bohemia, western Moravia and the Brno region, in 2011 they (232 employees) were registered primarily in Prague and Brno and also in regions in the north-south Bohemian axis of Liberec – Prague – České Budějovice.

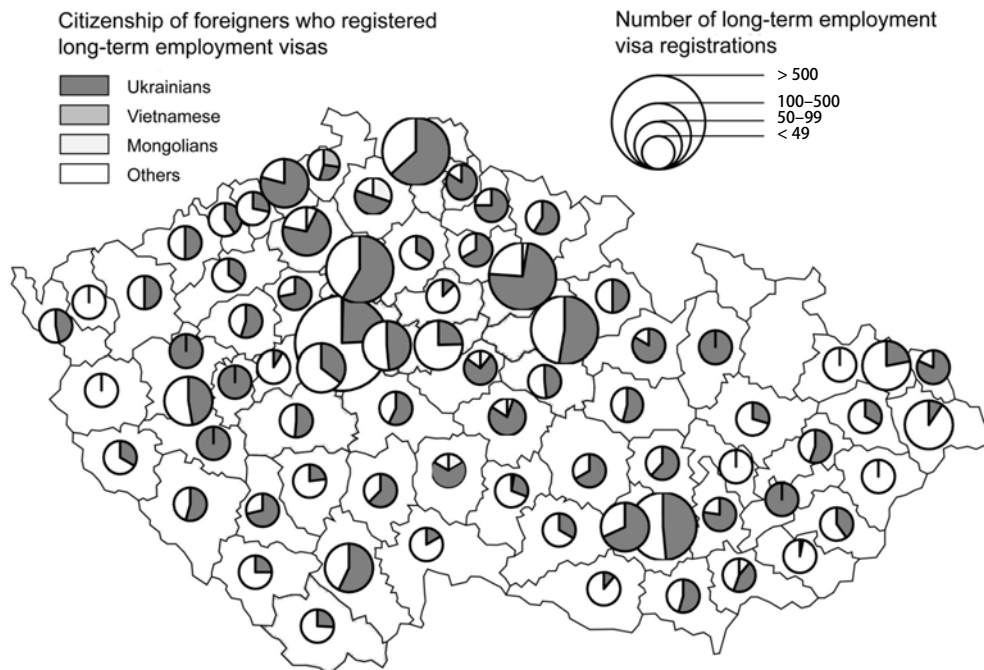
In 2008 there were registrations of about 2,000 new workers from Mongolia and 1,000 from Vietnam, but in the following years, only a few individuals who arrived in the country registered their place of residence.

Since 2009 there have been only two to six newly registered Vietnamese employees in total each year. While in 2009 (Figure 1) three new employees came to Děčín, the following year (Figure 2) two went to Prague and the Prague-West region and in 2011 (Figure 3) there were six new employees who registered their place of residence in the Prague region, Brno, Nový Jičín and Cheb.

As for registered new workers from Mongolia, a similarity can be observed in the spatial patterns in 2009 and 2010 (Figures 1, 2). Registrations were processed in the regions of Litoměřice, Česká Lípa and Prague in these years. Moreover, registrations continued in the Litoměřice region also in 2011. In 2009 new workers registered their residence also in the regions of Pardubice, Kutná Hora, Havlíčkův Brod, Pelhřimov, Jihlava and Hodonín, and in 2010 in the Pardubice, Mladá Boleslav and Prague-East regions. The distribution in 2011 differed and included also the regions of Chomutov, Kutná Hora, Pardubice and Blansko.

The regional distribution of registered places of residence of new workers from Ukraine, Mongolia and Vietnam with the AP seems to partially reflect the demand of certain corporations in the region for new workers from these countries. For example Vietnamese and Mongolian workers have often been employed with Foxconn CZ, s.r.o. in the Pardubice and Kutná Hora regions. Mongolians often work for Johnson Controls Inc. in the Česká Lípa and Litoměřice regions, for Apos – auto, s.r.o. in Blansko and for Pleas a.s. and Futaba Czech, s.r.o. in the Havlíčkův Brod area. As for new Ukrainian employees, there is no large corporation known for hiring new Ukrainians. It can, therefore, be presumed that they usually work for smaller companies or individuals (Bradáčová, 2009; Komárek, 2008; Kuthanová, 2008; Chocholáčková, 2009; Jihomoravské, 2010; Tollarová, 2012).

Figure 1 Registrations of Ukrainians, Vietnamese and Mongolians with long-term employment visas in regions in the Czech Republic in 2009



Source: AP (2012).

Note: There was carried out no registration of long-term employment visa in regions with no graph.

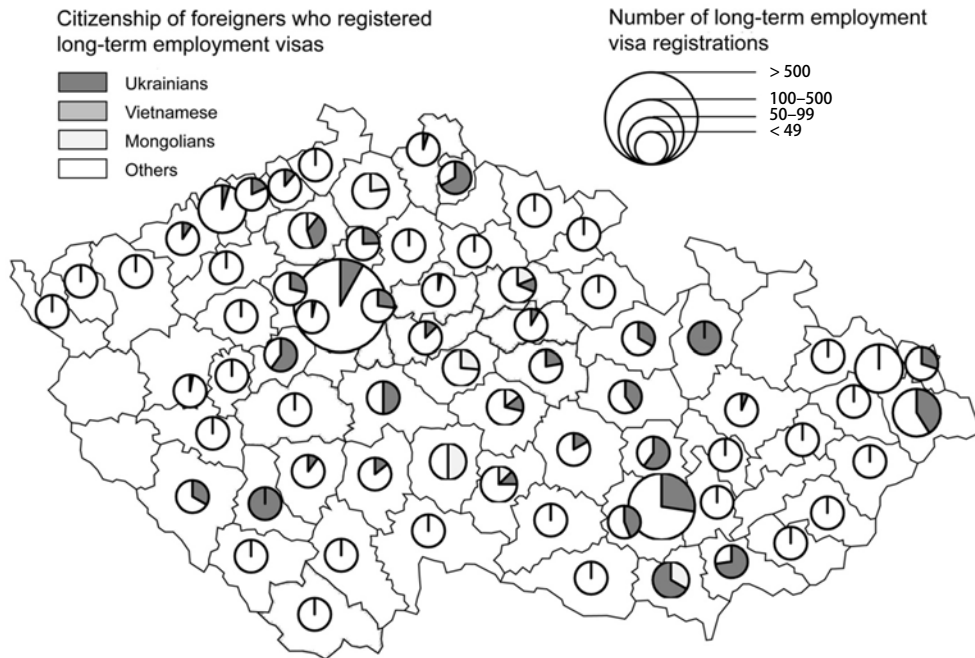
5.2 Work permit holders from third countries actually residing in the Czech Republic between 2008 and 2011 for the purpose of employment

As mentioned in Section 2, published data on the number of work permits issued are often used in analyses and comments as complete and reliable statistics on third-country foreigners working and residing in the Czech Republic. The following indicators that I described in Sections 3 and 4 will be used to show that the officially published statistics on the number of work permits issued do not correspond with the real number of foreign workers in the country:

- Total number of work permits and Green and Blue Cards issued)
- Renewed work permits
- Long-term employment visas issued by Czech embassies
- Long-term residence permits for the purpose of employment issued by Czech embassies

Before looking at the results, I will describe the specifications and limitations of this analysis: 1) Statistics on the number of visas/residence permits issued by Czech embassies are used to estimate the number of foreign workers in the Czech Republic. As discussed in Section 5.1, not all holders of visas/residence permits actually went to the Czech Republic, however, the number indicates the maximum possible number of new workers who could have come to the country; 2) The combination of instantaneous and interval indicators has its limitations, but based on the character of the data and the movement of people this is considered to be an effective way of estimating the number of workers who could be present in the Czech Republic on 31. 12. of the year; 3) It is assumed that there is a very low incidence of individuals who collected their long-term employment visas or long-term residence permits for the purpose of employment from Czech embassies

Figure 2 Registrations of Ukrainians, Vietnamese and Mongolians with long-term employment visas in regions in the Czech Republic in 2010



Source: AP (2012).

Note: There was carried out no registration of long-term employment visa in regions with no graph.

and who also obtained renewed work permits the same year being counted twice; 4) Foreigners who obtained a first work permit when already residing in the Czech Republic are not included in the analysis.

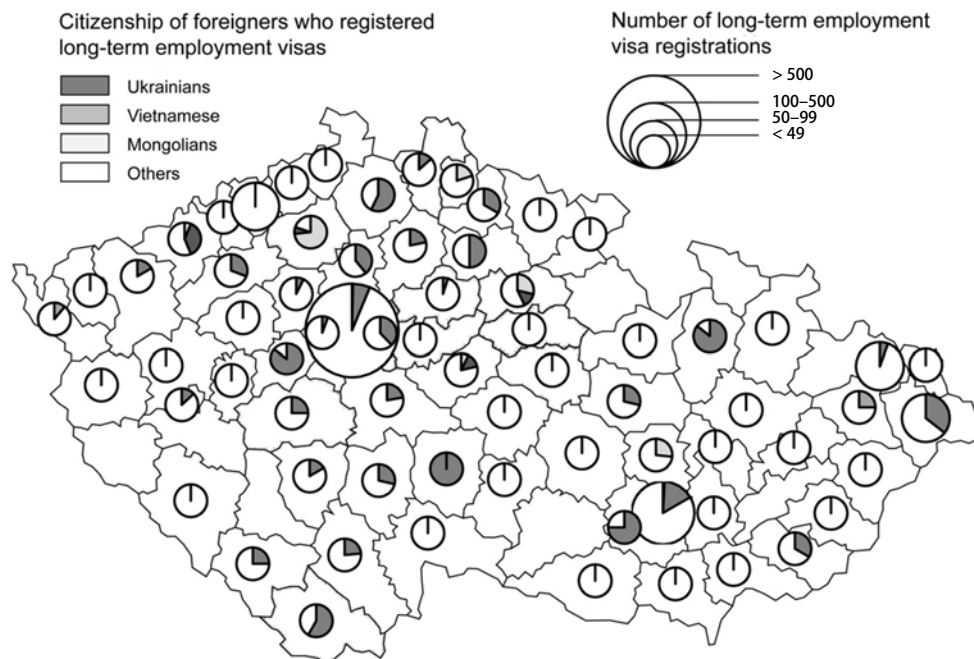
The number of potential work permit holders who could have been working in the Czech Republic in 2008, 2009, 2010 and 2011 was estimated as the sum of the number of long-term employment visas and long-term residence permits for the purpose of employment issued by Czech embassies and the number of renewed work permits (Table 2).

Table 2 shows that between 2008 and 2011 official statistics on the number of work permits and Blue and Green Cards issued to Ukrainians, Vietnamese and Mongolians was significantly higher than our estimate of the number of these foreigners who could in fact have been working in the Czech Republic.

In the case of workers from Ukraine, our estimate was about 37% lower than the officially published data

in 2008. This finding indicates that the official statistics included about 27,600 Ukrainian workers who probably were not in fact present in the Czech Republic. In 2011 the results indicate our estimate to be 'only' 24% lower than the official statistics, which indicated there were about 5,400 employees. As for Vietnamese, our estimate was 20% lower than the official statistics for 2008 (about 3,000 employees in absolute numbers). In 2009, 2010 and 2011 the difference between our estimate and the official statistics was only a few hundred (200 to 600). The most significant percentage differences between our estimate and the official statistics seemed to be in the case of Mongolian workers (35–47%). The absolute numbers of these workers who in fact did not come to the Czech Republic were ranged, however, from about 4,600 workers in 2008 to 700 workers in 2011. Moreover, Table 2 shows the trend of a decreasing difference between official statistics on the number of Ukrainians,

Figure 3 Registrations of Ukrainians, Vietnamese and Mongolians with long-term employment visas in regions in the Czech Republic in 2011



Source: AP (2012).

Note: There was carried out no registration of long-term employment visa in regions with no graph.

Vietnamese and Mongolians and our estimates between 2009 and 2011, which is explained by the low number of very new people from these countries coming to the Czech Republic for the purpose of employment (see Section 5.1).

6 CONCLUSION

This paper contributes to the discussion on labour migration indicators that differ by source, the different information that these data provide and the representativeness reflecting the real number of foreign employees in the Czech Republic. The number of work permits issued is implicitly and sometimes also explicitly considered to indicate the real number of third-country workers in fact working in the Czech Republic. This interpretation is, however, misleading, which this article has tried to show by examining indicators on work permit holders from Ukraine, Vietnam and Mongolia.

First, the number of new employees from Ukraine, Vietnam and Mongolia who entered the Czech Republic for the purpose of employment was estimated. In this respect, between 2009 and 2011 2 to 12 times more first work permits were issued to citizens from Ukraine, Vietnam and Mongolia than the number of new workers from these countries who collected their long-term employment visas or long-term residence permits for the purpose of employment from the Czech embassy and arrived in the Czech Republic to work that year.

Nevertheless, it remains a question how many of these individuals who collected their long-term employment visas or long-term residence permits for the purpose of employment from Czech embassies in fact arrived in the Czech Republic. A partial answer can be obtained from the interval approach indicator of registrations of the place of the residence by holders of long-term employment visas during the year (data on registrations of residence permit holders are

Table 2 Official statistics on the number of employees staying in the Czech Republic versus our estimates, 2008–2011

Year	Estimation of the number of potential work permit holders who could work in the Czech Republic			Official statistics (issued work permits, Blue Cards and Green Cards) ¹⁾	Difference between official statistics and estimation total (in %) ³⁾	Difference between official statistics and estimation total (absolute numbers, in thousands)
	Long-term employment visas + long-term residence permits for the employment purpose of stay issue by Czech Embassies ¹⁾	Renewed work permits ²⁾	Estimation total			
Ukrainians						
2008	21,879	24,445	46,324	73,937	37.3	27.6
2009	7,014	25,959	32,973	48,844	32.5	15.9
2010	992	20,640	21,632	31,487	31.3	9.9
2011	481	16,528	17,009	22,441	24.2	5.4
Vietnamese						
2008	10,441	1,494	11,935	14,969	20.3	3.0
2009	570	984	1,554	2,109	26.3	0.6
2010	85	950	1,035	1,454	28.8	0.4
2011	33	643	676	922	26.7	0.2
Mongolians						
2008	5,195	2,747	7,942	12,525	36.6	4.6
2009	224	1,667	1,891	3,573	47.1	1.7
2010	130	1,474	1,604	2,675	40.0	1.0
2011	65	1,122	1,187	1,835	35.3	0.7

Source: Horáková, M. – Macounová, I. (2009, 2010, 2011, 2012); MLSA (2012); AP (2012); own calculations.

Note: ¹⁾ Officially published data by Horáková, M. – Macounová, I. (2009, 2010, 2011, 2012); Green Cards have been tracked since 2009 when they came into force; Blue Cards have been tracked since 2011 when they came into force.

²⁾ Long-term employment visas and long-term residence permits for the purpose of employment issued by Czech Embassies during the year.

³⁾ 100 % is official statistics.

not available), which is available for individual Czech regions. This indicator, however, probably does not fully reflect reality.

The decrease in the number of new employees from Ukraine, Mongolia and Vietnam after 2008 was caused not only by the decrease in the number of job opportunities in the Czech Republic but also by the restrictive immigration measures introduced. One of these measures was the launch of an official online system for making an appointment to submit an application for a long-term employment visa or long-term residence permit for the purpose of employment with the embassy – the so-called Visapoint system. This system was applied in some of the main source countries of labour migration, including Ukraine, Mongolia and Vietnam, allowing only a limited number of applicants to make an appointment to apply for a visa or residence permit for the purpose of employment. On the other hand, Visapoint makes the process of submitting long-term employment visa or long-term residence permit applications transparent, equal for all applicants in that country, more effective and more convenient for the applicant (Zpráva, 2010, 2011).

After the Visapoint system was introduced, some foreigners may have applied for business or family dependency visas/residence permits even though they intended their primary purpose of residence in the Czech Republic to be the employment. However, it is likely that involved only a small number of cases.

Secondly, the number of Ukrainian, Vietnamese and Mongolian employees who could have been working in the Czech Republic (in the selected years) was estimated and compared with official statistics on the number of work permits issued as published in Horáková and Macounová (2009, 2010a, 2011, 2012).

The difference between the official statistics published in Horáková and Macounová and our estimate indicates that even if a work permit is issued (and included in the official statistics), the person may not reside in the country. Therefore the official statistics on issued work permits seems to be a misleading indicator for determining the number of foreigner employees residing in the Czech Republic.

I believe that this article may help lead to a revision of the structure of published statistical data on foreigners employed in the Czech Republic and improve the understanding of such data, as they are important sources of information for the analysis of international labour migration. Based on the article's findings, it is suggested that the number of first and renewed work permits should be published separately from the total number of work permits issued. As for the statistics on visas and long-term residence permits, a reasonable suggestion would be to publish data on residence permits for the purpose of employment separately from the total number of permits.

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COHORT FERTILITY IN THE RESULTS OF THE 2011 POPULATION AND HOUSING CENSUS¹⁾

Roman Kurkin

Introduction and methodology

It has been possible to calculate cohort fertility rates ever since the Population and Housing Census in 1930. A question on the number of live-born children was first asked in that census. Only women aged 15 years and over now have to answer this question, which refers to the whole reproductive history of a woman. Fertility relates the number of live-born children to the number of women. Only cohort fertility can be calculated from census data (not period fertility, which is available from ongoing demographic statistics). Cohort fertility rates relate to fertility at the time of the last birthday of a woman or to a cohort of women, and they indicate the average number of live-born children of a woman. When a woman passes a certain age threshold, then we refer to completed fertility. The upper limit of the reproductive age is often defined differently because of the increasing share of women who are giving birth at older ages.

Cohorts of women born between 1941 and 1965 are considered as the reference in this paper. Their age range was between 45 and 70 years at the time of the 2011 Population and Housing Census. The majority of these women have already completed their reproduction, so it is possible to talk about completed fertility. The share of live births per woman age 45 and over has been increasing in recent years. However, this share has not yet surpassed the one promile threshold (as of 2012). It is also necessary to specify an upper age limit for the reference cohort, which if it is not set can result in biased results. Women with children often

live longer than those without children. The subject of censuses are only living persons, so the completed fertility of older women could be overrated.

Cohort fertility can also be biased by non-response. A high non-response rate was especially typical for the optional questions on ethnicity (25%) and religious belief (45%). Only 4% of women aged 15 years and over did not respond to the question on the number of live births.

Data on live births per women and in relation to women's sociodemographic characteristics are unique in nature. In the Czech Republic, there is no other way of obtain these data with such a detailed geographical breakdown. Cohort fertility rates, which are calculated from these data, are important input for population projections, and for other scientific projects, not only in the field of demographic research, or for making amendments to family policy.

Cohort fertility in the 1991, 2001 and 2011 censuses

The results of the last three Population and Housing Censuses show that the postponement of child-bearing is now a clear trend. While women between the ages of 20 and 24 in 1991 on average had one child, ten years later the figure decreased to 0.3 children and in 2011 to 0.16 children. The biggest increase in the cohort fertility rate compared to the younger age group appeared in the 20–24 age group in 1991, 25–29 in 2001 and 30–34 in 2011.

Because a relatively small share of women give birth to a child at an older age, fertility was regarded as completed between the ages of 40 and 44 in the 1991 and 2001 censuses (which gave a completed fertility rate of 2.05 children per woman). In 2011 it was 1.87 children per woman. This cohort probably has not yet reached the end of its lifetime reproduction.

1) This article was prepared with the financial support of the SVV of the Faculty of Science, Charles University in Prague.

Table 1 Cohort fertility rates, 1991–2001

Age group	Permit residence		Usual residence
	1991	2001 ¹⁾	2011
15–19	0.05	0.02	0.02
20–24	1.08	0.30	0.16
25–29	1.48	1.05	0.55
30–34	1.89	1.67	1.25
35–39	2.03	1.93	1.71
40–44	2.05	2.05	1.87
45–49	2.01	2.09	1.94
50–54	2.03	2.09	2.02
55–59	2.06	2.06	2.06
60–64	2.08	2.09	2.06
65+	2.04	2.17	2.05
Women aged 15+	1.69	1.68	1.58

Note: ¹⁾ Population and Housing Census 2001 collected data on number of children ever born, while Censuses which took place in 1991 and 2011 collected information on children ever born alive.

Source: Czech Statistical Office.

A comparison between the 2001 and the other two censuses could be affected by the fact that data on the number of children ever born was collected in 2001, while in 1991 and 2011 data was collected on the number of live births. The number of stillbirths has decreased in recent decades. Between 1920 and 1950 the share was about 2%, and after the year 1960 the rate dropped below 1% and continued to decrease. This points to the conclusion that there could be a significant bias among older age groups.

Another methodological issue emerged in connection with the distinct definition of the place of residence. The 2011 Population and Housing Census is the first one in which the results were processed by place of usual residence (in conformity with international recommendations). However the differences between permanent and usual residence are, in the case of the cohort fertility rate, quite small in Czech Republic. Even the biggest difference (women aged about 25 years) is on a level of one thousandth.

Cohort fertility by marital status

The cohort fertility of women born between 1941 and 1965 reached a figure of 2.02 children per women in the 2011 Population and Housing Census. The age of these women ranges between 45 and 70 years, so their reproductive period is concluded and for this age group it is possible to refer to completed fertility. Marital status is an important factor of reproductive behaviour, especially in the case of completed fertility. Never married women bore significantly fewer children (0.52) than all women aged 40–70 (2.02). Women married at least once most often have two children. The two-child family is still the most common family model. Divorced women are more frequently satisfied with one child (22.5% of divorced women) and widowed women relatively more often have three or more children (27.8% widowed women).

Table 2 Cohort fertility rates (cohort 1941–1965) by marital status, 2011 Census

Marital status	Number of live-born children (in %)				Cohort fertility
	0	1	2	3+	
Never married	65.0	24.7	6.8	3.6	0.52
Married	3.0	13.8	60.4	22.8	2.09
Divorced	3.8	22.5	51.9	21.8	1.99
Widowed	3.8	16.0	52.5	27.8	2.15
Not identified	22.5	25.4	35.0	17.1	1.59
Women aged 40–70	5.4	16.1	55.9	22.6	2.02

Source: Czech Statistical Office.

Cohort fertility by municipality size groups and regions

Cohort fertility rates decrease with increasing municipality size by population. This obvious trend is shown in Figure 1. While the least populous municipalities with fewer than one thousand inhabitants have about 2.2 children per women, in the big cities with a population over 100,000 inhabitants the figure is only 1.9 children. Small villages have a larger share of population with lower levels of education and therefore with poorer opportunities in the labour market, and they tend to have more children. By contrast, big cities are full of job opportunities and career odds are better. Women are less willing to interrupt their career and raise a child.

The region that traditionally has the lowest fertility rate is the Capital of Prague, where the average number of live-born children for the 1941–1965 cohort does not exceed 1.7 children. Other economically developed regions like Plzeňský and Jihomoravský follow behind with a large gap. On the other hand, the Vysočina Region has by far the highest cohort fertility rate (2.2 children per women). The Pardubický, Olomoucký a Zlínský Regions follow with 2.1 children per women. In these regions, traditions and

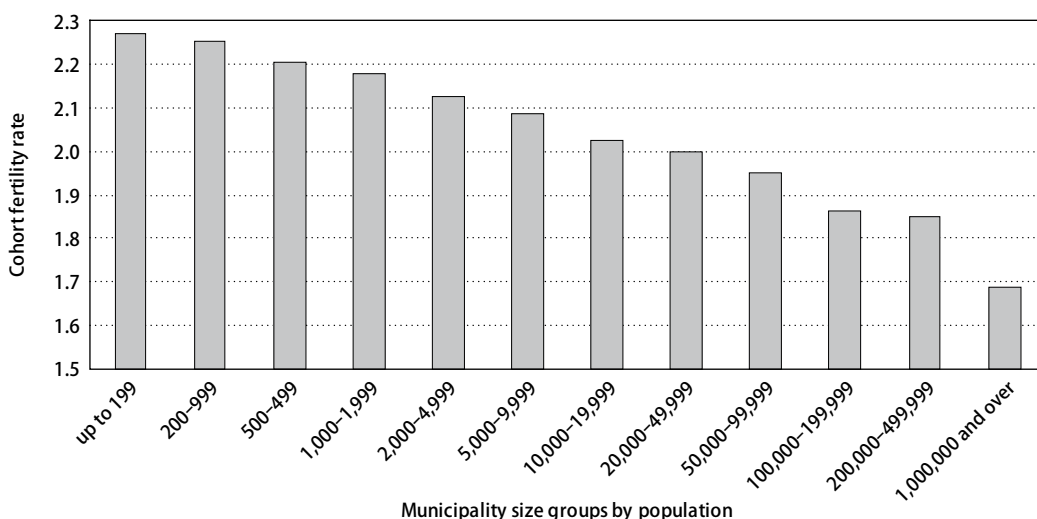
norms play a crucial role in shaping the reproductive behaviour of women.

The spatial pattern of the cohort fertility rate does not match the administrative boundaries of the regions. Therefore, it is important to look at a more detailed map (see Figure 3). Areas with the highest cohort fertility can be seen in northwestern Bohemia, around the historical border between Bohemia and Moravia, in the western part of the Moravskoslezský Region, and near the border with Slovakia in the Zlínský Region. Lower figures are found in the capitals of the administrative regions and their suburban areas.

Cohort fertility by educational attainment

Educational attainment is one of the most crucial differential characteristics of cohort fertility. Figures from the 2011 Population and Housing Census are summed into categories based on the international standard classification of education (ISCED 97). In the Czech Republic, women with a higher level of education (ISCED 4, 5 and 6 – post-secondary and tertiary education) have fewer children on average than those with a lower level of education (ISCED 2 and 3 – lower secondary or upper secondary

Figure 1 Cohort fertility rates (cohort 1941–1965) by municipality size groups, 2011 Census



Source: Czech Statistical Office.

education). Women with an ISCED 0 or 1 level of education (pre-primary or primary education) have lower cohort fertility rates than women with an ISCED 2 level of education. This is because these women are often childless (about 30% of them). However, this group is not large (only 13,000 women in the 1941–1965 cohort).

There are several explanations for the dependency between educational attainment and the number of children ever born. One of them is connected with tertiary education, which leads to the postponement of childbearing. Consequently, the time gap for fulfilling reproductive goals is smaller. Another possible explanation is that tertiary-educated women are more often successful in the labour market, which results in their prioritising of their career over family. Therefore, family policies directed at achieving a work-life balance are crucial to intensifying the level of fertility.

Cohort fertility by ethnicity and religious belief

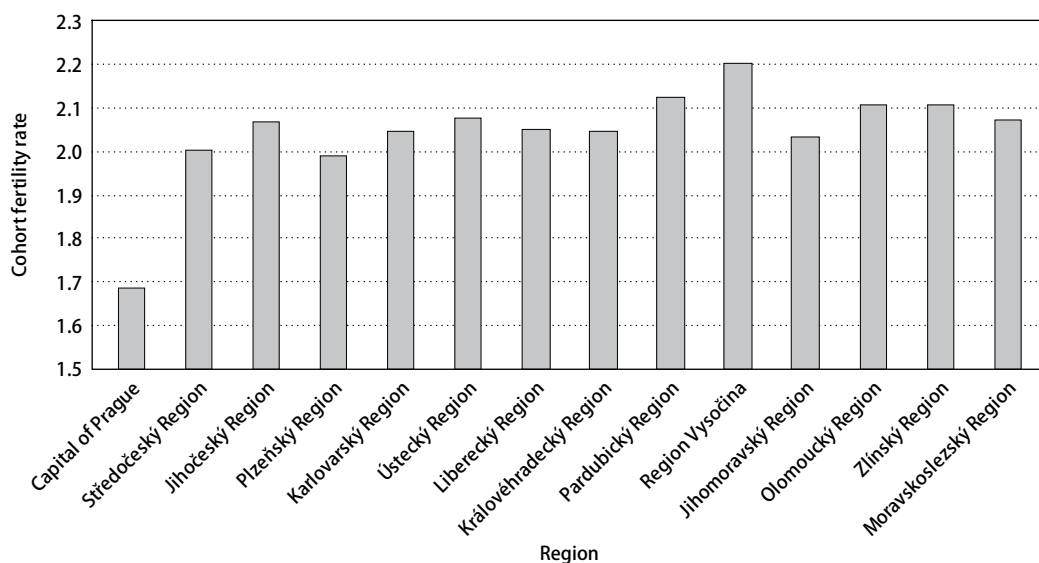
A large share of inhabitants in the 2011 Census did not declare their ethnicity (25%) or religious beliefs (45%) because, in conformity with international recommendations, these questions were optional. Moreover, these are sensitive issues. The sensitivity

of these questions is especially great in states with a totalitarian history like the Czech Republic. Cohort fertility rates by ethnicity or religious belief could be biased thanks to the large non-response rate, which probably results in an underestimation of cohort fertility by ethnicity and religious belief. The reason is that according to the results of the quality indicators, people with a lower level of education have a propensity to respond to fewer questions (this is especially true in the case of ethnicity and religious belief) and they also tend to have more children.

As can be seen in Table 4, women of Moravian and Silesian ethnicity have a cohort fertility rate more than 0.1 children higher than women with Czech ethnicity. They inhabit the same state as Czechs and do not have any strong inclination to separate from the Czech Republic. Historically, they are more traditional and more often declare a religious faith than Czechs.

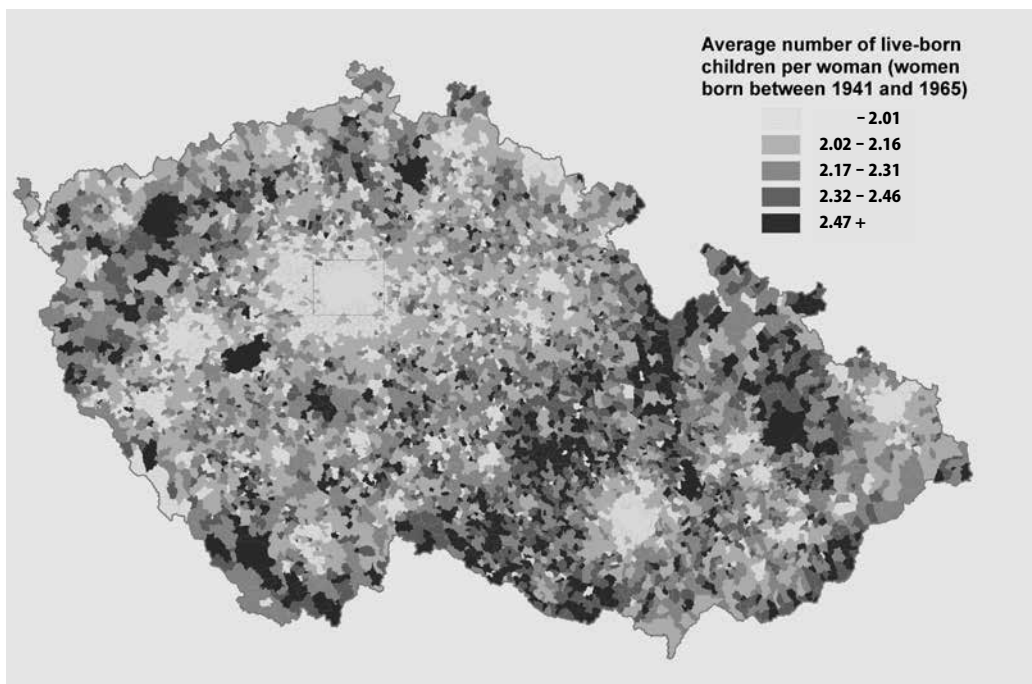
Women with Slovak (2.18 children) and Roma ethnicity (3.40 children) have even higher cohort fertility rates. Women with Russian and Ukrainian ethnicity residing in the Czech Republic have lower cohort fertility rates (1.55 and 1.77) because they are often labour migrants, who have higher education

Figure 2 Cohort fertility rates (cohort 1941–1965) by regions (NUTS 3), 2011 Census



Source: Czech Statistical Office.

Figure 2 Cohort fertility rates (cohort 1941–1965) by regions (NUTS 3), 2011 Census



Source: Czech Statistical Office.

Table 3 Cohort fertility rates (cohort 1941–1965) by educational attainment, 2011 Census

ISCED 97	Number of live-born children (%)				Cohort fertility
	0	1	2	3+	
ISCED 0	31.5	9.8	24.5	34.2	2.02
ISCED 1	26.7	10.8	25.7	36.8	2.11
ISCED 2	4.8	12.2	47.4	35.7	2.29
ISCED 3	4.3	16.0	59.1	20.7	2.01
ISCED 4	6.5	20.2	59.5	13.8	1.83
ISCED 5	8.6	22.2	57.3	12.0	1.75
ISCED 6	14.5	27.6	48.8	9.0	1.54
Not identified	14.3	18.9	41.3	25.5	1.94
Women aged 40–70	5.4	16.1	55.9	22.6	2.02

Source: Czech Statistical Office.

and tend to have fewer children than women with this ethnicity in their country of origin.

Women with a religious faith who did not identify with a particular church or religious society have on average a similar number of live-born children as women with no religious faith (see Table 4). In con-

trast, women with a religious faith who identified with a church or religious society tend to have slightly more children. Taking into account only churches with more than 20,000 members, Roman Catholic women tend on average to have more children (2.12) than women who belong to other religious denominations.

Table 4 Cohort fertility rates (cohort 1941–1965) by ethnicity and religious belief, 2011 Census

Ethnicity	Cohort fertility	Religious belief	Cohort fertility
Czech	2.00	Believers not identified with a church or religious society	1.98
Moravian	2.14		
Silesian	2.12	Believers identified with a church or religious society	2.11
Slovak	2.18		
Polish	2.05	of which:	
German	1.96	Czechoslovak Hussite Church	1.88
Roma	3.40	Roman Catholic Church	2.12
Russian	1.55	Evangelical Church of Czech Brethren	2.04
Ukrainian	1.77	Orthodox Church in the Czech Lands	1.84
Vietnamese	1.89	No religious belief	1.97
Not declared	2.08	Not declared	2.04

Source: Czech Statistical Office.

Table 5 Cohort fertility rates (cohort 1941–1965) by occupation, 2011 Census

ISCO-08 ¹⁾ , major groups	Cohort fertility
Armed forces occupations	1.94
Managers	1.85
Professionals	1.84
Technicians and associate professionals	1.87
Clerical support workers	1.90
Service and sales workers	2.02
Skilled agricultural, forestry and fishery workers	2.33
Craft and related trades workers	2.07
Plant and machine operators, and assemblers	2.09
Elementary occupations	2.16
Not applicable ²⁾	2.09
Not identified	2.08

Note: ¹⁾ International Standard Classification of Occupations; ²⁾ economically inactive population and unemployed.

Source: Czech Statistical Office.

Women employed in occupations that require a higher level of education tend on average to have fewer children. For example, professionals (lawyers, doctors, academics etc.) managers and technicians and associate professionals have cohort fertility rates of about 1.85 children per women. On the other hand, women working in less qualified occupations have more children (about 2.1 per woman). Employees in the agricultural sector have the highest cohort fertility rate (2.3 children per woman).

Conclusion

The total fertility rate (transversal indicator) decreased to a threshold of 1.3 during the 1990s. This

was an unprecedented figure, which worried not only demographers but society as a whole. The demographically strong generation known as 'Husák's children', which was born in the 1970s, when the state adopted a broad pronatalist population policy, should have given birth to more children in the 1990s. Because of the postponement of child-bearing, their children were born later and the total fertility rate eventually increased in the 2000s. The extent of the recuperation in fertility is still a question. According to the results of the 2011 Population and Housing Census, this generation has not yet completed its reproductive period, but it looks like the two-child limit, for the first time in history, will not be surpassed.

CHALLENGES OF AGEING SOCIETIES IN THE VISEGRAD COUNTRIES

Elwood D. Carlson

The Visegrad countries include Poland, the Czech Republic, Slovakia and Hungary. This edited volume presents fifteen essays in English by leading scholars in the region, sharing their insights into aging trends and prospects within the four countries. After a summary introduction by Zsuzsa Széman, Spéder and Bálint set the stage by outlining the demographic context of rapid population aging characteristic of all these countries. With special attention to data from Hungary, they also show the inexorable decline of living together with other family members and increases in self-perception as elderly, in dissatisfaction with health conditions, and in feelings of loneliness in successively older cohorts.

Perek-Białas extends the analysis of circumstances of the elderly by cross-country comparisons of rates of labor force participation versus retirement in late working ages, a matter of acute importance in these countries since they all manifest a temporary bulge of people that will reach the end of these working ages in the coming decade, unlike countries in western Europe. The analysis highlights a sharp difference in attitudes about dependent living arrangements for retired elderly in the Visegrad countries, with attitudes in Poland and Slovakia more in favor of coresidence with children (similar to Balkan country attitudes) but attitudes in Hungary and the Czech Republic more in favor of state-mediated intergenerational transfers of wealth (similar to western European attitudes). Bodnárová follows up with details of ongoing efforts in Slovakia to cope with the challenges posed by population aging for a retirement system inherited from state socialism, with its untenable early retirement ages. Efforts at linking old-age pension payments to payments into the system during working ages and to encourage

programs for individual retirement saving are running into opposition in the population despite the disastrous prospects for the system in the absence of such changes.

Scharle considers a different economic problem facing Hungary (and probably also the other countries) where a comparatively high share of the working-age population is not employed due to disability classification. This situation, originating in the socialist period when firms sought to avoid liability for health problems of employees by retiring them early at the first sign of trouble, has translated into a persistent problem in the post-socialist context of falling demand for labor. The efforts of Hungary to encourage and re-integrate this disability population back into the labor force is another way of addressing the intensifying actuarial challenge of increasing elderly populations depending on declining numbers in the working ages.

Tóth changes the direction of the volume with her chapter on partner violence against older women, based on survey data that shows the prevalence of this often “invisible” social problem, and debunks popular myths by showing that it is unilateral, recurrent and long-lasting when it happens. With this change of focus, the book shifts from population description to analysis of policies and programs aimed at specific problems of the growing elderly population. Leichsenring provides a foundation for this new focus with a review of policies for state support of long-term care in growing elderly populations of western Europe, particularly Italy. Throughout the volume there is a frank recognition that the Visegrad countries (and eastern Europe generally) may be able to learn from experiences of western Europe, where all such policies are further advanced than in the east. Turai then looks at the very specific situation of workers providing such care to the elderly, with a focus on the subset of these workers who are immigrants from less-developed countries — a phenomenon especially salient in aging European societies. Holmerová, Vanková and Wija provide a more systemic analysis

of long-term care delivery in the Czech Republic, with added discussion of the controversy about whether healthy life expectancy or disabled life expectancy is increasing faster, and of the policy decisions that must be made about whether such long-term care is a matter for health care or wider social service agencies. Rácz then examines the outcome of such service provision, to document whether intervention programs can affect the health of the elderly, and concludes that exercise programs in particular appear to have positive effects — but the question of selectivity into such programs may need further study.

The next three chapters turn to the issue of changing housing requirements that go along with population aging. Vidovicova explores results of a Czech survey of an urban sample of older adults, to assess the role of their residential context on health and life satisfaction. Garniss examines shortcomings of housing available to seniors in Poland who wish to live independently, but who require specialized facilities to do so. The deficiencies are again traced back to the lack of attention to such issues during the state socialist period, and to a housing stock that consequently lags seriously behind emerging requirements. Széman follows up on this problem with analysis of a specific program in Hungary designed to retro-fit currently-inadequate

housing left over from the socialist era, to modify these places and make them workable for seniors with special needs who still wish to live on their own.

The final two chapters in the book, by Kucsera and by Széman, launch an entirely different topic as a way of ending the volume. These studies document the impact of electronic technology, especially transponders, cell phones, and computers, on the ability of older citizens to transcend some of the limitations imposed on them by deteriorating health, mobility, social networks and financial circumstances. Using such electronics to establish new lines of communication between the elderly and others in society (both non-coresident family members and health specialists) offers some promise of improving a quality of life that is otherwise under so much threat in all these countries.

Despite the daunting challenges of a legacy of problems inherited a generation ago from the earlier state socialist regimes in the region, these studies by scholars within the Visegrad countries illustrate the fact that their own research is producing a clear understanding of these problems and their foundations, and also is exploring and documenting new policies and practices that can help each of these countries to cope with such challenges in the coming years.

THE VIENNA YEARBOOK OF POPULATION RESEARCH 2011¹⁾

Martina Miskolczi

The yearbook of the Vienna Institute of Demography for the year 2011 is dedicated to reproduction and reproductive decision-making and family planning in a family, but not only in a family. The contributions to the yearbook focus on theoretical, meth-

odological and empirical approaches in 2011 and take in even marginal issues. Compared to the previous year, the number of articles supporting the demographic debate has increased to eight and the number of refereed articles has remained at ten. Most of the countries described in this volume are European. The book presents a variety of scientific opinions and attitudes to the fact of whether and when to have a child. Moreover, it does not limit itself

1) Morgan, P. S. – Sobotka, T. – Testa, M. R. (ed.) 2012. *Vienna Yearbook of Population Research 2011*. Volume 9. Vienna: Vienna Institute of Demography, Austrian Academy of Science. 2012. Available at: <www.oeaw.ac.at/vid/yearbook/>. ISBN 978-3-7001-7235-2.

just to the field of demography and contains also reflections on economics, politics, the social field and other areas.

In the Introduction the editors of the yearbook, *Maria Rita Testa* and *Tomáš Sobotka* from the Vienna Institute of Demography and *Philip S. Morgan* from Duke University in the United States, discuss an integrated macro-micro framework comprising four levels of analysis (the level of society = macro-level conditions; social structure = social outcome: fertility rates in the population; the individual = individual background; and action = individual reproductive behaviour) and five important linkages among them. These elements and linkages need to be investigated in order to analyse fertility decision-making and the path from intended fertility behaviour to actual fertility, i.e. whether the intention was or was not realised. Specifically, macro-level conditions, such as the societal, economic and cultural environment affect the social structure but also micro-level behaviour (individual reproductive behaviour) via macro-micro link. Societal norms impact even individual decision-making regarding reproduction.

Ajzen's Theory of Planned Behaviour (TPB) from back in the 1980s described three main determinants of intentions regarding fertility: these are the normative pressure of relatives and friends (beyond crucial factors such as partnership, education, employment, housing and work-life balance), personal attitudes towards having a child and the ability to perform that behaviour. The Theory of Planned Behaviour plays an essential role in the yearbook – most of the authors refer to it and, especially in the debate part of the book, it is the main theory. In addition, new longitudinal data in many European countries (such as the Generations and Gender Surveys) provide a great deal of useful information for analysing reproduction and reproductive decision-making in detail.

Despite the fact that the TPB was and is widely used and is useful, many attempts are made in the yearbook to overcome the difficulties related to applying the TPB to fertility. The authors in the debate part of the yearbook make a number of suggestions to extend, improve and adjust the TPB, either by incorporating the dynamic life-course trajectories of individuals (*Barber, Klobas, Liefbroer, Philipov*), using multiple behaviours opportunities

(*Barber, Philipov*), exploring more complex ideas about the links between societal and individual-level factors (*Klobas, Liefbroer, Philipov*) or adopting other methods that introduce a higher level of complexity into the theory. Another approach is to analyse the link between intentions and subsequent reproductive behaviour in the case of any type of disagreement between partners and any type of decisional conflicts in a couple (*Miller, Philipov*). However, having a child is not always the outcome of reasoned action, and the underlined motivations may not be reflected in theory at all (*Barber, Miller*). An extension of the theory is offered by *Morgan* and *Bachrach* who introduce alternative theoretical concepts; for example, explaining fertility not only as an individual function of environmental opportunities and constraints but also as a direct function of individuals' perceptions or interpretive frameworks. In the debate section all the contributors unite in calling strongly for the need for greater clarity of understanding the intention of having a child – how this intention is created, how it can be measured, whether it develops over time and what role it plays in subsequent reproductive action etc.

The first four articles in the section of refereed articles propose methodological approaches to the study of fertility preferences that could refine the existing measurement of childbearing intentions. The following three articles focus on the relationship between reproductive intentions and subsequent behaviour. The last three contributions take into account the institutional context (family policies) and the historical context.

The first contribution, **Differences between Fertility Desires and Intentions: Implications for Theory, Research and Policy** by *Miller*, proposes methodological approach to considering various fertility preferences. *Miller* describes his/a three-step motivational sequence of fertility decision-making, the so-called Theory of Conjunctural Action (TCA) (motivational traits → fertility desires → fertility intentions) and compares two constructs of intentions.

Bhrolcháin and *Beaujouan* use time series based on the General Household Survey in Great Britain in their article **Uncertainty in Fertility Intentions in Britain 1979–2007** to study uncertainty in fertility intentions. They call for deeper research in order to develop new tools for measuring fertility intentions

and levels of certainty and uncertainty. Uncertainty is explained as a rational response to the evolving life course, which might reflect different states of mind of an individual, such as ambivalence and indecision about the question of childbearing.

In **Fertility Preferences: What Measuring Second Choices Teaches Us**, *Hin et al.* introduce an analysis of the hierarchy of reproductive preferences rather than a single target (the fertility ideal). This analysis is based on an online survey in the Netherlands from 2010 that included questions about second, third or even fourth alternative choices to the ideal number of children. The distance between the ideal number of children and the second or third choice is considered differently, depending on whether the number is lower or higher than the first choice. As the authors stress, the degree of an individual's willingness to substitute one ideal for another under different circumstances provides useful insight into why many people's behaviour may deviate from their stated initial ideal.

Testa, Cavalli and *Rosina* consider couple disagreement to be the most important reason why some people do not complete their reproductive intentions in their article **Couples' Childbearing Behaviour in Italy: Which of the Partners Is Leading It?** Based on Italian data for 2003–2007, they analyse the influence of each of the partners on childbearing decision-making in the case of a conflict in a couple. They find that the family formation process starts (with no children at the beginning) with the woman in a more powerful position in the reproductive decision-making process. After the first child is born, the influence of both the man and the woman is equal, regardless of who does or does not want another child. Therefore, surveys should investigate and collect data from both partners.

Balbo and *Mills*, in their article **The Influence of the Family Network on the Realisation of Fertility Intentions**, concentrate on family networks and their role in the realisation of short-term fertility intentions. Their findings from the Netherlands' survey show that people with strong family ties and networks do not have a strong motivation to have a large family and they more often do not realise their intentions for having a second or higher-order child. Second, if a brother or sister has a young child below the age of 12, then that person is more likely to realise short-term fertility intentions.

The article **Intergenerational Transmission of Fertility Intentions and Behaviour in Germany: the Role of Contagion** by *Kotte* and *Ludwig* uses German panel data to investigate the intergenerational transmission of fertility intentions and behaviour. They concentrate on both family networks (family of origin) and on social learning and social influence networks (friends, other significant people in people's lives). They offer evidence that, with some exceptions, the family very strongly influences an individual's intentions and behaviour regarding reproduction, measured using the number of siblings and the contagion of their fertility behaviour. The authors also report that friends and other significant people in a person's life who have recently had a child have a strong short-term influence on fertility preferences. Nevertheless, there are still problems with the selectivity and endogeneity inherent in the data set.

The article **Educational Differentials in Fertility Intentions and Outcomes: Family Formation in Flanders in the Early 1990s** by *De Wachter* and *Neels* addresses the relevance of the individual's socioeconomic status in the formation and implementation of reproductive plans based on data on women in Flanders. The authors show that a tertiary level of education is linked to both higher lifetime and higher short-term fertility intentions than lower levels of education. A high level of education also led to a higher intensity of childbearing during the economically uncertain period at the beginning of 1990s. Similarly, full-time employment plays a positive role in the family formation process, especially among tertiary-educated women. Also the progression to the second and third birth was more frequent among more highly educated women.

Family Policies, Norms about Gender Roles and Fertility Decisions in France and Germany by *Rossier*, *Brachet* and *Salles* use data from France and western Germany to compare fertility decisions in these two countries with different fertility levels and reproductive decision-making attitudes. They report on the different family-related policies, gender role attitudes and child care norms. As one of the most crucial factors influencing the different behaviours in these two countries the authors detected a social norm about the compatibility of motherhood and work outside the family. The nationally dominant

model of child care in Germany emphasises the role of the mother and her personal care, whereas in France a shared, external childcare system is widely accepted.

Rotkirch, Basten, Väsiänen and *Jokela* focus on men's motivation for children in **Baby Longing and Men's Reproductive Motivation**. They use data from Finland 2007–2009 to examine the level of men's desire to have a child. Surprisingly, almost one-half of men aged 20–59 had strong feelings about having a child at least once in their life. These feelings were associated with family plans, when to become pregnant, and the union formation process. On the other hand, they were not related to socioeconomic status (income, occupation, education).

Baranowska and *Matysiak* in **Does Parenthood Increase Happiness? Evidence of Poland** explore the consequences of intended reproductive behaviour on individuals' well-being, namely on happiness. They reveal the positive effect of a first child on the happiness of mothers and (slightly more weakly) of fathers, whereas the effect of a second or higher-order birth was not proven. Explanations for this could be that their emotional needs are already satisfied by the first child, or that the increased costs that come with having a child rose more steeply than the relative emotional benefits.

There are two articles in the section titled **Data and Trends**:

- **Design and Implementation of an Online Weekly Survey to Study Unintended Pregnancies**

by *Barber, Kusunoki* and *Gatny* describes the survey 'Relationship Dynamics and Social Life', which weekly collects data on attitudes and behaviour relating to pregnancy, relationships and contraceptive use among young women aged 18–22 in the USA.

- *Chromková Manea* and *Fučík* in **Couples' Disagreement about Fertility Preferences and Family-Friendly Policy Measures in the Czech Republic** describe the findings of an ad-hoc survey titled 'Marriage, Work and Family' in the Czech Republic in 2005. They show that agreement among partners in a couple on the number of intended children in most cases (80%) occurs out of a preliminary negotiation process between the partners.

The contributions published in this volume of the *Vienna Yearbook of Demographic Research* focus on human reproductive decision-making in the context of macro-level, couple and individual perspectives in European countries. The articles discuss various aspects of the desires, intentions, decision-making and real actions with the aim of understanding how reality ends up differing from people's desires and intentions. They also take into account the family network, social surroundings, family policies and historical impacts as important factors that influence reproductive decision-making.

What Interests World Demographers Today? Insights from the 27th International Population Conference in Busan, South Korea

At the end of August, the 27th IUSSP International Population Conference for demographers and scientists dealing with population development took place in Busan, the second-largest city in South Korea. This was a truly worldwide gathering, with speakers from all five continents presenting papers. According to the organisers, representatives from more than 170 countries came and took part.

As regards the vast scope of the conference, the organisers deserve recognition for being able to prepare and run ten to twenty sessions simultaneously for a period of five days, with 308 sessions, several poster sessions, and dozens of accompanying events, all in the beautiful modern environment of the BEXCO exhibition centre in downtown Busan. Technically everything was perfectly prepared. Each speaker was simultaneously translated from English into French, French into English, or from Korean into English and French.

On Monday 26 August the conference began with the Opening Ceremony. One of the key speakers at this evening event was Professor Un-Tae Park from the Korea Institute of Population Problems. Professor Park was instrumental in bringing the 27th IUSSP Conference to South Korea. The first keynote speech was given by François Héran from the French National Institute for Demographic Studies (INED). The topic of his presentation was 'Fertility and Family-Support Policies: What Can We Learn from the European Experience?' In this speech he presented fertility trends in selected OECD countries, commenting that: 'The recent economic shocks are a major test for the persistence of this divide and the effectiveness of family policies. This is a global crisis; no country has been left untouched.'

Many sessions were held over the six days of the population conference. The sessions on 27 August, for

instance, included: Access to and impact of HAART; Low fertility groups in developing countries; Migrant aspirations and strategies; Internal migration and urbanisation: special applications; Population ageing and intergenerational transfers: challenges for social welfare policies; Population and development; Methods in adult health and mortality; Sexuality and reproductive health; Multiple faces of the health transition; Political demography of the Asia-Pacific region; Marital status and mortality; Trends in the rates of mixed marriages; Global migration trends and determinants; Labour force participation and productivity at older ages; Population and poverty; Formal demography, innovative methodologies, and their applications; Life-course influences on health and mortality.

The second day had a structure similar to the first. Among the many sessions that day were: The determinants of health behaviours among adolescents; Gender and population: policy and policy outcomes; Age patterns of adult mortality in relation to causes of death and increasing longevity; Assessing HIV risk in hard-to-reach populations. In the afternoon there numerous poster sessions, which took place every day during the conference.

The session topics of the third day were particularly interesting for participants and included: Same-sex unions and families; Population ageing and intergenerational relations; The Demographic 'dividends': challenges for the near future; Demographic windows of opportunity and economic growth; Longevity, family life and social class in the Asia-Pacific region; Gender differences in life expectancy and mortality; The effects of violence on adolescents and youth.

The fourth day of the conference followed the same structure as previous days. Session topics focused

on mortality and longevity, fertility, causes of death or the ageing of the labour force in the labour market. Some topics particularly worth mentioning are: Advances in research on abortion in sub-Saharan Africa; The demographic and socioeconomic consequences of HIV/AIDS; Advances in population projections; The economics of population ageing, Methods for projecting fertility.

Other sessions on Friday offered different experiences. These sessions were devoted to such topics as causes of death (e.g. Methods for projecting all-cause or cause-specific mortality), fertility (e.g. Public policies and low fertility – theoretical considerations), migration (e.g. Migration and health; Migration and gender), population ageing (e.g. Economic development and population ageing; Ageing in Asia; Societal and family support).

The last day of the conference featured sessions with similar types of topics as on previous days, such as: Analysing causes of death to understand trends and differentials; Population and the environment; Population and human rights; Work-family and work-life issues; The consequences of an ageing workforce; New approaches to the collection and analysis of data on mortality and cause-of-death; Family dynamics and fertility: the role of men; Migration as a mode of adaptation to extreme climate events, natural disasters and environmental change.

Among the thousands of contributions it was possible to observe how the interests of different continents vary. Generally, great attention was paid to the family, family planning and fertility, pregnancy, abortions, the structure of family life and ensuring proper conditions for the upbringing of children, including hygiene conditions (water purity) and health standards (HIV); speakers also dealt with the issues of poverty, the social heterogeneity of populations and inequality in development. Some of the papers concentrated on migration and migrants, the inclusion of migrants in their new society and their participation in the labour market. It was also possible to observe an interest in health issues, reproduction, mortality and the rise in human life expectancy. Some sessions focused on adolescents and the younger population. Looking at current problems in modern Korean society, some associated sessions concentrated on the topics of low fertility and the ways of supporting fertility in Korea and in highly

developed countries. The problems facing highly developed countries were discussed in sessions that dealt with ageing, transition strategies and the impact of ageing on all areas of human life, in other words not only from a purely demographic viewpoint, but with respect to the impact on family life and the roles of individuals, social aid, health services, education, etc.

A large share of the papers presented dealt with the populations in India and China, and among these too were papers focusing on the development of populations in developing countries. In regular sessions there were also papers (albeit to a lesser extent) that discussed the populations in European countries.

There were sessions on mortality at both young and old ages and various methods for calculating mortality were also presented and discussed. There were also sessions on internal migration and family dynamics, migration and connected strategies, the internal migration of students in higher education in the Asian-Pacific region, and new techniques for calculating migration estimates.

A considerable proportion of the topics discussed at the conference had to do with population ageing. Individual sessions focused on the increase in the life expectancy, population ageing and inter-generational relations, family life and social classes in the Asian-Pacific region, and there were also sessions devoted to health and ageing in low-, medium- and high-income countries.

Ageing, a common phenomenon in advanced countries, is now gradually beginning to occur even in less developed countries. Examples of this are the large populations of China (1.35 billion inhabitants) and India (1.22 billion inhabitants), countries that over the course of the next few decades will have to address the serious impacts of ageing on the functioning of society as a whole. Xiujian Peng from China presented an extensive and complex model linking demographic processes in China up to 2050 with the functioning of the economy and specifically with several macro-economic indicators. This research showed that China needs to raise the retirement age and that it is facing serious threats from an imbalance in the numbers of men and women in the population. This is one of the reasons why the papers on ageing drew considerable interest at the conference.

The impacts of ageing were studied from a theoretical viewpoint – models of demographic projections,

models of the burden on the productive-age population, repercussions for the efficiency of the economy measured by macro-economic indicators, etc. – and from health and social viewpoints, with papers presented on changing roles in the family, changes in social care and the health service, changes in the labour market, etc.

The effect of raising the retirement age (a current issue in the Czech Republic and an unpopular one in every country) versus raising the level of economic activity on national economies was examined in quantitative terms in a number of papers. For example Sergej Ščerbov presented the results of his research which estimate that in the majority of European countries by 2050 the raising of the level of economic activity by one to two percentage points will be replaced by raising the retirement age by one year. In a discussion with Ščerbov, we obtained his results for the Czech Republic on this country's specific example of gradually raising the retirement age. Ceren Inan of France described the effects of an ageing workforce from a psychological and social viewpoint, investigating the psychosocial risks at work in the populations of the European Union (including the Czech Republic), and also from the viewpoint of age. He found, for example, that older workers in the period of about five years before regular retirement age show less fear of losing their job and of economic insecurity. Again, we contacted Inan and are in the process of acquiring concrete information about the situation in the Czech Republic.

The theme of ageing was also frequently accompanied by discussion of a related theme – mortality. These sessions also focused on new methods used to estimate mortality rates and dealt with mortality in the oldest age groups. There were also sections dealing with maternal mortality and the differences between the life expectancy of men and women. Vladimir Canudas-Romo of Mexico discussed the stagnation of life expectancy in Mexico during the first decade of the 21st century, looking particularly closely at changes in life expectancy trends in Mexico for men and for women. He analysed the impact of the high murder rate and other causes of death on life expectancy in the country.

Other contributions dealt with the trend in life expectancy in the countries of Central and South Africa. Richard Kapend of the UK presented an assessment of the number of persons killed in periods of war and peace; this paper dealt in greater detail with the high

number of deaths during the armed conflicts in the Democratic Republic of Congo. The aim was to assess larger population declines using projection techniques.

Equally interesting were the sections that presented progressive methods for calculating mortality tables and demographic projections. One was devoted to methods used to calculate fertility projections. Another dealt with the projection of mortality in relation to cause of death. Yet another focused on projections in cases where the fertility level is considered low. And other thematic sections were centred on education and human resources. There was a section on education and fertility, with papers presenting analyses of the effect of highest completed level of education on the birth of a second child in European countries or the lifetime fertility of men and women with higher education. Another session was on education and human resources, where the contributions dealt with education, salaries, and the reduction of income imbalance in Brazil, and in one case on the differences in education and the mechanisms of changes to human resources created by married women in Japan.

Other interesting papers concerned labour productivity among older people. In particular, Isalia Nava-Bolanos of Mexico discussed the participation of elderly Mexicans in the labour market and tried to identify the main factors that impact a workforce consisting of persons over the age of 60. Another interesting contribution in this section was from Bheemeshwar Reddy Amireddy of India and was entitled: 'Which older people participate in the creation of the workforce in India?' It investigated the participation of older people in the labour market in India from 1983 to 2009–2010. It also analysed the way in which socio-economic and demographic factors influence older people to decide to join the labour market

Another interesting session was entitled 'Evaluation of planned parenthood' (reproduction policy). One paper in this section examined the effects of the restriction of abortions and budget cuts on family planning in Texas. Another paper looked at reproductive health-care policy for ethnic minorities in Vietnam.

Among all the interesting themes at this conference it is essential to mention the session devoted to the topic of the demographic dividend and economic growth. Particularly worth noting is the paper by Wolfgang Lutz, who discussed the favourable

effect of changes in the age structure following a drop in fertility, a phenomenon known as the demographic dividend. Lutz's findings indicate such positive effects as an improvement in education levels, which is crucial for productivity, and a rise in incomes, and he shows that a fundamental part of the demographic dividend is an educational dividend. In a paper entitled 'A joint link between policy, contributing to a change in fertility and the demographic dividend', Anrudh Jain looked at the opportunities for rapid economic growth to be derived from a permanent drop in fertility in India, and he drew attention to the absence of uniform timing among the Indian states and therefore the differing utilisation of certain potential.

An important part of the conference consisted of sections dealing with historical demography and population poverty (these papers focused on intentions relating to fertility behaviour, the growth of the child generation and nutrition in North Malawi, or on changes in fertility and the reduction of poverty in India). Also worth mentioning are the sections in which the main theme was population development and climate changes associated with this, nutrition disorders, health and mortality. Sections on the risk of HIV infection in geographically inaccessible populations, the bonds in same-sex families, or on research into

health, risky behaviour and mortality among adolescents also formed an important part of the conference.

Other areas discussed at the 27th IUSSP Conference were changes and progress in areas concerning demographic methodology, calculation procedures, data quality, and predictions and estimates.

At the Closing Ceremony of the 27th IUSSP International Population Conference, the 'Mattei Dogan Foundation Award for Comparative Research in Demography' was awarded to Gunnar Andersson from Stockholm University. He presented a paper offering various comparisons between European countries, of which two interesting topics were highlighted. He presented the gender-combinations of the first two children in the case of the birth of a third child in a family, and the trends in same-sex partnerships and opposite-sex partnerships/marriages.

We would like to acknowledge that our participation in the 27th IUSSP population conference was made possible with the support of the Internal Grant Agency (IGA 24/2013) and with support of the Rector's Office at the University of Economics in Prague.

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University of Economics in Prague

More information

- <http://www.iussp.org/en/event/17/info>
- <http://www.iussp.org/sites/default/files/Conference%20Programme.pdf>

In Memory of Ladislav Růžička

On 10 July 2013, Ladislav (Lado) Růžička, a distinguished Czech demographer who spent much of his professional career in Australia, passed away. His death closed the life story of a remarkable man, and one of the very few Czechs to make a mark in the international demographic scene.

Růžička was born in Prague on 9 November 1920. As a young man he suffered the consequences of the Nazi and then the Communist dictatorships. Under each of those regimes, he was expelled from university studies and forced to leave Prague to perform manual jobs. Gradually, however, Růžička's intellectual abilities and extreme tenacity enabled him to overcome this initial handicap. In 1958 he took a job as an assistant in the Department of Hygiene and Epidemiology at Charles University, where he began working on his doctoral thesis on mortality and causes of death in the working-age population (the study was published as a book by Academia in 1966). In the bibliography of Czechoslovak statistics and demography compiled by Jaroslav Podzimek, there are more than 40 publications dating from between 1959 and 1968 that list Růžička as author or co-author. The majority of Růžička's output in this period consists of studies on mortality and causes of death, but there is also work on nuptiality, fertility, rural population change, demographic ageing, and the methodology of population projections. The high point of Růžička's academic work in the 1960s is his monograph *Sebevražednost v Československu z hlediska demografického a sociologického* (Suicide in Czechoslovakia from a Demographic and Sociological Perspective; Academia 1968) and the succinctly titled *Demografie* (Svoboda 1971), a comprehensive volume that he co-authored with Vladimír Srb and Milan Kučera and that until the mid-1980s was generally regarded as the basic textbook of demography in the Czech language.

In the late 1960s, during the political thaw in Czechoslovakia, Růžička was invited to join as a consultant the Population Division of the United Nations in New York. Růžička accepted this invitation with pleasure, and after the Warsaw Pact invasion



of Czechoslovakia he decided not to return to Prague. Life in New York, however, was not to his taste, so in 1969 he had himself transferred to India for a two-year engagement as a UN expert at the International Institute of Population Studies in Bombay. While there, he learned that the Department of Demography at the Australian National University in Canberra (ANU) was looking for a lecturer and decided to apply. The prominent Australian demographer Jack C. Caldwell, who at that time headed the Department, later recalled how much effort it took him to persuade ANU to give a chance to a fifty-year-old Czech with an unpronounceable name who had hitherto published almost exclusively in his native tongue. But Caldwell's efforts paid off and Růžička was eventually hired by the ANU. He approached his journey to Australia in a manner that provides a good illustration of his character and sense of adventure: he exchanged the air ticket from Bombay to Canberra that the ANU sent him for a cheaper one to Perth, there he bought

a second-hand car and drove across the Australian outback until, after some obstacles along the way, he arrived happily in front of the building of ANU's Research School of Social Sciences.

Růžička's time in Australia was an extraordinarily successful and productive period in his life. He and Jack Caldwell got along brilliantly together both professionally and personally, and they quickly became close colleagues. In 1977 they published their joint study *The End of Demographic Transition in Australia*, which until today is viewed as a major contribution to the demographic history of Australia for its methodological inventiveness and documentary depth. But above all, Růžička's time in Canberra allowed him to fully pursue his life-long interest in the comparative analysis of mortality and the health status of human populations, as is apparent from the many articles he published in respected journals and the numerous books he edited under the auspices of the International Union for the Scientific Study of Population (IUSSP). Růžička also published noteworthy studies on nuptiality and fertility in Australia and other countries. Evidence of the high quality of Růžička's scientific output is that he was bestowed membership in the Australian Academy of Social Sciences in 1976, and was repeatedly invited to perform important organisational functions in the IUSSP, including serving for several years as the chair of the IUSSP Scientific Committee on Biological and Social Correlates of Mortality. In addition to pursuing research at ANU, Růžička also taught there, drawing on his deep knowledge of statistical demography. He thus influenced the early education of dozens of young demographers, many of whom later went on to success even outside Australia (examples include Alan Lopez, Peter McDonald and Gigi Santow). In recognition of Růžička's pedagogic legacy, the ANU established in 2000 *The Lado Ruzicka Prize in Social Research* that is being awarded annually to outstanding postgraduate students.

Růžička's erudition, industriousness, and personal charm earned him the friendship and genuine respect of his Australian colleagues. When Jack Caldwell on the occasion of Růžička's 80th birthday wrote in the journal *Demos* that "Lado Ruzicka was Czechoslovakia's gift

to Australian demography", he was making a friendly compliment as well as stating an undeniable fact.

Růžička remained in touch with Czech demography after 1968 and watched its progress with keen interest. For years he exchanged letters with his former Prague colleagues – mainly Vladimír Srb, Vladimír Wynnyczk and Milan Kučera – and he was a regular reader of the journal *Demografie*. He visited Prague briefly in the spring of 1990 and again two years later, and on both occasions he spoke at seminars of the Czechoslovak Demographic Society. During his visits to Prague he also offered selfless assistance to young Czech demographers, including the writer of these lines who, thanks to Ladislav Růžička, in 1992 won a three-year PhD scholarship at ANU.

In 1985 Růžička retired from ANU, but not from work. In the 1990s he initiated, or contributed to, the writing of more than a dozen scholarly publications and often worked as a consultant for WHO, AusAID and other organisations. With his wife Penny Kane he published articles on various demographic topics, and together they beautifully renovated the building of an old school in Major's Creek, a former gold-mining village in New South Wales, where Lado and Penny welcomed many friends as guests and from where they often set out in their off-road car on long journeys into the remote corners of Australia. The last seventeen years of Růžička's life were affected by serious health problems, which he faced, however, with extraordinary courage and an admirable state of mind. In July 2012 he left his beloved Australia and moved to England to be closer to his Czech and English relatives. He died one year later.

With the passing of Ladislav Růžička, Czech and world demography have lost an extraordinary figure. Those who had the luck to know him personally will remember him as an exceptionally intelligent, erudite, practical, and unsentimental individual, but also a very sensitive and kind human being who lived life to the fullest and with joy. Many of us loved him, and we all acknowledge his achievements in demography and his contribution to science.

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Population and vital statistics of the Czech Republic 2012: Towns with more than 50,000 inhabitants

Town	Population 1 July	Population 31 December	Marriages	Divorces	Live births	Abortions	Deaths	Increase (decrease)			Marriages	Divorces	Live births	Deaths	Total increase
								Natural	Net migration	Total					
								per 1,000 inhabitants							
Praha	1,243,695	1,246,780	5,807	2,788	14,176	4,171	12,411	1,765	3,351	5,116	4.7	2.2	11.4	10.0	4.1
Brno	378,191	378,327	1,742	1,194	4,365	1,199	3,925	440	-1,078	-638	4.6	3.2	11.5	10.4	-1.7
Ostrava	298,327	297,421	1,276	830	2,932	1,094	3,341	-409	-1,792	-2,201	4.3	2.8	9.8	11.2	-7.4
Plzeň	167,323	167,472	755	435	1,712	787	1,755	-43	213	170	4.5	2.6	10.2	10.5	1.0
Liberec	102,141	102,113	477	286	1,176	499	1,059	117	-9	108	4.7	2.8	11.5	10.4	1.1
Olomouc	99,325	99,471	506	296	1,106	368	996	110	-168	-58	5.1	3.0	11.1	10.0	-0.6
Ústí nad Labem	93,943	93,747	365	260	998	420	947	51	-562	-511	3.9	2.8	10.6	10.1	-5.4
České Budějovice	93,523	93,467	464	278	1,071	492	1,021	50	-203	-153	5.0	3.0	11.5	10.9	-1.6
Hradec Králové	93,225	93,035	412	192	932	361	947	-15	-440	-455	4.4	2.1	10.0	10.2	-4.9
Pardubice	89,501	89,467	423	243	974	265	989	-15	-70	-85	4.7	2.7	10.9	11.1	-0.9
Havířov	77,894	77,371	364	228	724	318	869	-145	-987	-1,132	4.7	2.9	9.3	11.2	-14.5
Zlín	75,557	75,555	301	221	768	253	747	21	-126	-105	4.0	2.9	10.2	9.9	-1.4
Kladno	68,595	68,551	318	217	757	340	794	-37	-94	-131	4.6	3.2	11.0	11.6	-1.9
Most	67,202	67,490	269	194	654	310	673	-19	451	432	4.0	2.9	9.7	10.0	6.4
Opava	58,076	58,054	235	147	581	234	577	4	-231	-227	4.0	2.5	10.0	9.9	-3.9
Karviná	58,411	57,842	215	157	532	222	710	-178	-813	-991	3.7	2.7	9.1	12.2	-17.0
Frydek-Místek	57,581	57,523	261	181	584	253	548	36	-260	-224	4.5	3.1	10.1	9.5	-3.9
Jihlava	50,664	50,598	251	130	537	184	490	47	-118	-71	5.0	2.6	10.6	9.7	-1.4
Teplice	50,352	50,330	211	155	525	251	569	-44	-10	-54	4.2	3.1	10.4	11.3	-1.1
Děčín	50,297	50,289	205	154	505	276	525	-20	-2	-22	4.1	3.1	10.0	10.4	-0.4
Karlovy Vary	50,373	50,172	233	144	426	174	557	-131	-291	-422	4.6	2.9	8.5	11.1	-8.4

Radek Havel

Population and vital statistics of the Czech Republic 2012: Areas and regions

Area (NUTS 2), region (NUTS 3)	Population 1 July	Population 31 December	Marriages	Divorces	Live births	Abortions	Deaths			Increase (decrease)			Marriages	Divorces	Live births	Deaths	Total increase
							Total	Within 1 year	Within 28 days	Natural	Net migration	Total					
Česká republika	10,509,286	10,516,125	45,206	26,402	108,576	37,733	108,189	285	175	387	10,293	10,680	4.3	2.5	10.3	10.3	1.0
Praha	1,243,695	1,246,780	5,807	2,788	14,176	4,171	12,411	22	11	1,765	3,351	5,116	4.7	2.2	11.4	10.0	4.1
Střední Čechy	1,285,945	1,291,816	5,567	3,614	14,428	4,861	12,752	30	25	1,676	10,795	12,471	4.3	2.8	11.2	9.9	9.7
Jihozápad	1,208,397	1,209,298	5,254	3,047	12,423	4,824	12,507	33	20	-84	1,535	1,451	4.3	2.5	10.3	10.4	1.2
Severozápad	1,129,801	1,128,490	4,638	3,174	11,035	5,072	12,031	42	23	-996	-1,705	-2,701	4.1	2.8	9.8	10.6	-2.4
Severovýchod	1,508,292	1,507,980	6,471	3,771	15,444	5,511	15,614	47	28	-170	-717	-887	4.3	2.5	10.2	10.4	-0.6
Jihovýchod	1,678,769	1,679,857	7,181	3,996	17,487	5,230	16,932	55	36	555	1,052	1,607	4.3	2.4	10.4	10.1	1.0
Střední Morava	1,226,136	1,225,302	5,089	2,853	11,796	3,841	12,794	30	18	-998	-1,368	-2,366	4.2	2.3	9.6	10.4	-1.9
Moravskoslezsko	1,228,251	1,226,602	5,199	3,159	11,787	4,223	13,148	26	14	-1,361	-2,650	-4,011	4.2	2.6	9.6	10.7	-3.3
Hl. m. Praha	1,243,695	1,246,780	5,807	2,788	14,176	4,171	12,411	22	11	1,765	3,351	5,116	4.7	2.2	11.4	10.0	4.1
Středočeský kraj	1,285,945	1,291,816	5,567	3,614	14,428	4,861	12,752	30	25	1,676	10,795	12,471	4.3	2.8	11.2	9.9	9.7
Jihočeský kraj	636,381	636,611	2,756	1,595	6,655	2,419	6,504	18	9	151	322	473	4.3	2.5	10.5	10.2	0.7
Přelžský kraj	572,016	572,687	2,498	1,452	5,768	2,405	6,003	15	11	-235	1,213	978	4.4	2.5	10.1	10.5	1.7
Karlovarský kraj	302,484	301,726	1,297	880	2,820	1,253	3,072	9	4	-252	-1,187	-1,439	4.3	2.9	9.3	10.2	-4.8
Ústecký kraj	827,317	826,764	3,341	2,294	8,215	3,819	8,959	33	19	-744	-518	-1,262	4.0	2.8	9.9	10.8	-1.5
Liberecký kraj	438,593	438,594	1,929	1,142	4,592	1,939	4,386	13	8	206	-212	-6	4.4	2.6	10.5	10.0	0.0
Královéhradecký kraj	553,290	552,946	2,337	1,354	5,467	2,010	5,825	18	10	-358	-552	-910	4.2	2.4	9.9	10.5	-1.6
Pardubický kraj	516,409	516,440	2,205	1,275	5,385	1,562	5,403	16	10	-18	47	29	4.3	2.5	10.4	10.5	0.1
Kraj Vysočina	511,627	511,207	2,208	995	5,148	1,557	5,223	12	10	-75	-655	-730	4.3	1.9	10.1	10.2	-1.4
Jihomoravský kraj	1,167,142	1,168,650	4,973	3,001	12,339	3,673	11,709	43	26	630	1,707	2,337	4.3	2.6	10.6	10.0	2.0
Olomoucký kraj	637,837	637,609	2,669	1,526	6,303	2,043	6,701	16	11	-398	-631	-1,029	4.2	2.4	9.9	10.5	-1.6
Zlínský kraj	588,299	587,693	2,420	1,327	5,493	1,798	6,093	14	7	-600	-737	-1,337	4.1	2.3	9.3	10.4	-2.3
Moravskoslezský kraj	1,228,251	1,226,602	5,199	3,159	11,787	4,223	13,148	26	14	-1,361	-2,650	-4,011	4.2	2.6	9.6	10.7	-3.3

Radek Havel

Abstracts of Articles Published in the Journal Demografie in 2013 (Nos. 1–3)

Jitka Rychtaříková

TWO DIFFERENT POPULATIONS: CHILDREN BORN IN AND OUT OF WEDLOCK

The decomposition of factors impacting fertility change in the Czech Republic between the years 1986 and 2010 showed that the decrease in the fertility rate and the increase in the illegitimacy ratio were related to the rise in the share of unmarried women. Logistic regression revealed that nonmarital births occurred more often among younger mothers with lower education levels and most of these were first-order births. Births to unmarried women without a reported father had a higher risk of being stillborn or having a low birth weight.

Keywords: marital fertility, nonmarital fertility, time change, decomposition, logistic regression, Czech Republic

Demografie, 2013, **55: 04–26**

Klára Hulíková Tesárková – Petr Mazouch

BASIC COHORT MORTALITY ANALYSIS AT HIGHER AGES: AN ANALYSIS OF THE RECTANGULARISATION PROCESS BASED ON COHORTS BORN IN 1890–1910 IN THE CZECH REPUBLIC AND FRANCE

The aim of the article is to conduct a basic mortality analysis of persons aged 60 and over, focusing on the cohort perspective. The Czech Republic and France were selected for comparison. Owing to data availability the analysis covered cohorts born in 1890–1910, where for each of the two countries it was possible to use data only from one particular source. Moreover, these cohorts can be assumed to be extinct today. People in these cohorts reached the age of 60 and over starting in the year 1950, so it is also possible to study significant period effects on cohort data caused by developments in the second half of the 20th century. This approach makes it possible to study mortality development at the highest ages while using the concept of rectangularisation of the survival curve, or mortality compression, as theoretical basis of the analysis. The assumptions of this concept were not however fully verified for any of the studied populations.

Keywords: mortality, cohort life tables, period life tables, limit of the life span, life expectancy, rectangularisation process

Demografie, 2013, **55: 27–46**

Michal Katuša – Jozef Mládek – Branislav Bleha

ATTITUDES TO FAMILY FORMATION AMONG THE URBAN POPULATION IN BRATISLAVA AND THE POPULATION OF SLOVAKIA AS A WHOLE

The article focuses on the reproductive and family behaviour of the population of Bratislava by combining official statistical data with the results of a survey completed in 2009. With respect to the substantial demographic changes that have occurred in the past 15–20 years, Bratislava appears to be ahead of other urban and rural populations in Slovakia, because the postponement of fertility and other changes began taking place there sooner. The extent of the changes also seems to be stronger in Bratislava than in other regional populations. The survey thus constitutes a case study of an urban population, who seem to be displaying a pioneering pattern of behaviour within Slovakia. The main goal of the study is to show, using a quantitative survey, what attitudes and preferences are typical of (in particular) young people in Bratislava and what ideational shifts and differences have occurred, compared to the results of previous surveys published several years ago. The question of a shift from tradition and altruism to modernity and liberalism is under discussion.

Keywords: reproductive behaviour, family behaviour, Bratislava, Slovakia, survey *Demografie*, 2013, **55: 47–66**

Markéta Kocová

ANALYSIS OF MORTALITY DEVELOPMENT IN RUSSIA USING VARIOUS DECOMPOSITION METHODS

This article analyses the development of mortality in Russia from 1960 to 2010, with a focus on the period after the collapse of the Soviet Union, when the intensity of mortality sharply increased. It uses various decomposition methods often applied in demographic analyses of mortality to explore in detail mortality in the largest country in the world. The use of different decomposition methods of decomposition allows us to observe mortality from multiple angles and thus to reveal the hidden features of mortality development in Russia.

Keywords: mortality, Russia, decomposition, senescent and background
mortality, causes of death, mortality crisis *Demografie*, 2013, **55: 105–116**

Michaela Šimečková

THE TRANSFORMATION OF LATE MATERNITY IN THE CZECH REPUBLIC FROM A DEMOGRAPHIC POINT OF VIEW

The article thematically treats the issue of late motherhood in the Czech Republic from a demographic point of view. It describes the changes that have occurred since the 1920s up to the present as to fertility of women aged over 35, using selected demographic indicators. It focuses on the analysis of selected demographic factors using binary logistic regression. In the very end, the character of late motherhood is discussed. Based on the results of the analysis, it distinguishes three different types of late motherhood.

Keywords: late motherhood, maternity, fertility, Czech Republic,
logistic regression *Demografie*, 2013, **55: 117–131**

Mohammad Salim Zahangir – Mosammat Zamilun Nahar

FERTILITY IN RURAL AND URBAN BANGLADESH: A COMPARATIVE STUDY

This article uses data from the 2007 Bangladesh Demographic and Health Survey (BDHS) on women aged 40–49 to conduct a comparative study of rural and urban completed fertility. Application of the technique of binary logistic regression shows that female education and labour force participation in Model 1 and age at first marriage in Models 1 and 2 are the leading mechanisms in relation to rural and urban fertility. Access to mass media is significant to some extent, followed by religion and spousal age difference. The male spouse's education and having ever used any method of contraception are found to be insignificant. Rural women are more likely to have more children than their urban counterparts.

Keywords: rural and urban, fertility, mean CEB, binary logistic regression, Bangladesh

Demografie, 2013, 55: 132–144

Terezie Štyglerová – Michaela Němečková

POPULATION DEVELOPMENT OF THE CZECH REPUBLIC IN 2012

This article describes the demographic situation in the Czech Republic in 2012 and evaluates it in the context of development since 2005, focusing mainly on the last year-on-year change. The study analyses the decelerating pace of population growth, the process of changing age and marital status structures towards population ageing and the growing share of unmarried. It examines the continuing decreases in nuptiality and mortality, the decline in the divorce rate in the last two years since peaking in 2010 and the stagnation of fertility after its rise in 2002–2008. Migration and abortion rate are also discussed.

Keywords: demographic development, population, age structure, nuptiality divorce, fertility, abortion, mortality, migration, Czech Republic

Demografie, 2013, 55: 189–207

Ladislav Rabušic – Beatrice Chromková Manea

FAMILY SIZE – OPINIONS, NORMS AND REALITY

Many studies point to the fact that realised fertility is below the level of ideal family size and below fertility intentions (e.g. Goldstein – Lutz – Testa, 2003). In this article, the authors focus on the relationship between opinions on family size, the ideal number of children, and the actual number of children, using data from a sociological study conducted on the Czech population aged 40–55. The first part of the paper deals with issue of family size from a normative point of view and presents three indicators: small, large and standard family size. It then goes on to discuss the desired number of children under ideal conditions and the actual number of children, and tackles the issue of how these two indicators are linked. It also investigates whether people have a clear idea of the number of children they want to have, whether their plans change in time, and how their plans relate to realised fertility.

Keywords: reproductive behaviour, fertility ideals, normative family size, actual number of children

Demografie, 2013, 55: 208–219

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- Roubíček, V. 1997. *Úvod do demografie*. Prague: Codex Bohemia.
- Hantrais, L. (ed.). 2000. *Gendered Policies in Europe. Reconciling Employment and Family Life*. London: Macmillan Press.
- *Potrady*. 2005. Prague: Ústav zdravotnických informací a statistiky.

Articles in periodicals

- Bakalář, E. and Kovařík, J. 2000. 'Fathers, Fatherhood in the Czech Republic.' *Demografie*, 42, pp. 266–272.

For periodicals that use consecutive page numbering within a volume it is not necessary to indicate the issue number.

Chapter contributions

Daly, M. 2004. 'Family Policy in European Countries.' In *Perspectives on Family Policy in the Czech Republic*, pp. 62–71. Prague: MPSV ČR.

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Conference papers

Maur, E. 'Problems with the Study of Migration in the Czech Lands in Early Modern History.' Paper presented at the conference 'The History of Migration in the Czech Lands during the Early Modern Period. Prague, 14. 10. 2005.

References

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Syrovátka, A. 1962a. 'Injuries in the Household.' *Czech Paediatrics*, 17, pp. 750–753.

Syrovátka, A. 1962b. 'Child Mortality from Automobile Accidents in the Czech Lands.' *Czech Medical Journal*, 101, pp. 1513–1517.

In-text references

(Srb, 2004); (Srb, 2004: pp. 36–37); (Syrovátka et al., 1984).

Table and figure headings

Table 1: Population and vital statistics, 1990–2010

Figure 1: Relative age distribution of foreigners and total population of CR, 31 Dec 2009

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