

## Cohort research on Russian youth intraregional migration

### ***Abstract***

*As long as migration involves mainly young people, their relocation to the big cities has the strongest impact on demographic structures both in core and peripheral areas. That is why we are focusing our prime attention on this particular age group. Unfortunately, Russian migration statistics is quite unreliable. It has failed to record "student age" movement in the last decades. So we consider the best way to fill this gap is to use the Census data. In this paper we used the so called "survival method". The core idea is to compare cohorts in adjacent census years taking mortality into account. The discrepancy would stand for migration. The curtail advantage of this method is that, having appropriate data, we can evaluate migration losses and gains at any administrative level. Our data allows us to study intraregional population dynamics. As mortality is insignificant in youth cohorts, we are mostly dealing with migration. Our estimates show that during the last intercensal period (2002-2010) up to 70% of youth cohorts have left regional periphery for good after graduating school. For comparison, previous intercensal period (1989-2002) has shown only 40% decrease in periphery's youth cohorts. At the end of the paper we estimate the return rate of "student age" movers. There is no significant return to the demographically depleted periphery in the young working ages.*

### ***Key words***

*Inner periphery, internal migration, youth migration, cohort migration studies, Census maps, survival method.*

### ***Introduction***

Migration has a huge influence on demographic structure formation both in donor and host areas. And this factor is eventually becoming more and more important with populations' demographic development. According to the idea of the Third Demographic Transition, migration is becoming the main driver of population dynamics in the most demographically developed countries (Coleman, 2006). This tendency became clear on the international level only in the last several decades when, after the Second World War, the developed countries experienced a great inflow of international migrants (Borjas, 1989; Fassmann and Munz, 1992; Massey et al., 1993; Willekens, 1994; Filipov and Schuster, 2010; Wilson et al., 2013; Ediev et al., 2013). The phenomenon took time to be noticed because of the difficulties with migration statistics record. The effect of migration on demographic structure formation is much more significant at subnational level. That is why this effect was firstly noticed and studied for the internal migration (Ravenstein, 1885; Zipf, 1946; Hyrenius, 1951; Zelinsky, 1971; Fielding, 1989; Champion et al., 1998).

In this research we are studying the impact of migration on demographic structures at sub-regional level of administrative division using census data. We are focusing our prime attention on the youth migration because their relocation determines the greatest changes in the demographic structure. Migration is the lot of young. This thesis is very well known. The selectiveness of migration was noted even in Ravenstein's "Laws of migration" (Ravenstein, 1885). The term of "differential mobility" was firstly introduced by Dorothy Thomas (Thomas, 1938). Empirical support for this finding was provided later (Castro and Rogers, 1983; Bailey, 1993; Millington, 2000; Rogers et al., 2002).

## Visual analysis and hypothesis

The hypothesis about the remarkable role of internal migration in the process of demographic structure formation was caused and supported by visual analysis of Russian Census 2010 maps. The maps were built at the sub-regional level of administrative division. At the moment of Census 2010 there were 83 regions in Russia and more than 2300 municipal districts. The choice of the level of municipal districts gives us the unique possibility to study intraregional migration.

The idea of our hypothesis formation is clear. Census provides us with the demographic structure of the population. The demographic structure itself shows the result of long-lasting influence of demographic processes. Diversity in the levels of fertility and mortality persist but are not able to explain huge differences within regions. So the internal spatial difference of demographic structure characteristics could be seen as a clear imprint of migration due to the mentioned above age selectiveness of the demographic process. We would like to show here just one of the number of Russian Census maps. For the whole gallery of maps see the link in Appendix (maps #1-8), see also (Кашницкий, 2014).

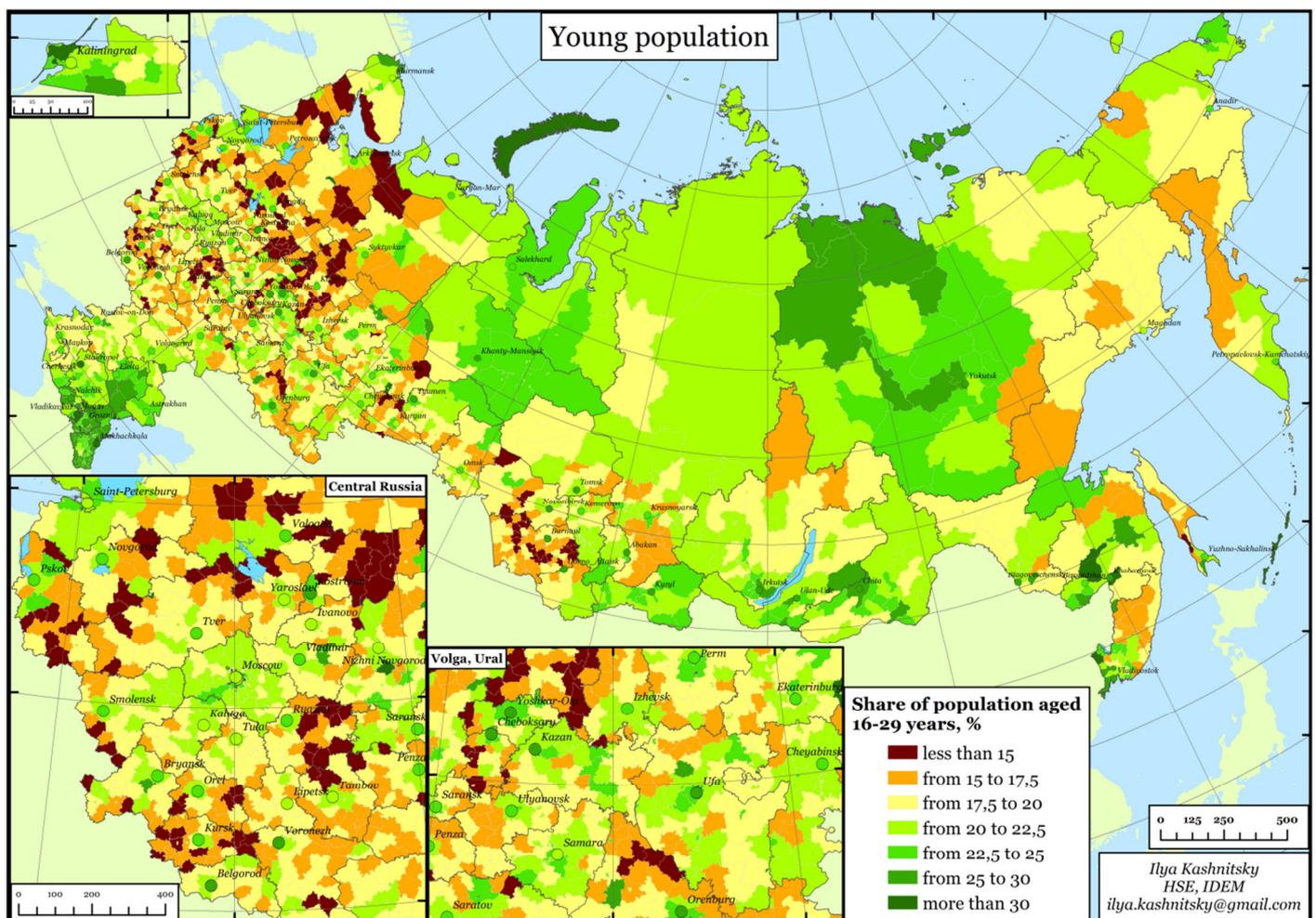


Figure 1. Share of young population (aged 16-29) by Russian municipal districts, Census 2010.

It is obvious that every regional center is much younger than the surrounding inner periphery. Naturally, regional centers have also smaller demographic burden, bigger share of young female population. Here we tend to see the clear impact of migration, mainly internal but also interregional and even international. Our further cohort-wise investigation of intraregional migration is aimed to support this hypothesis.

## Phenomenon of institutional population

Closer look at the Census maps (Figure1, Appendix #1-8) shows that not only regional centers are relatively young but also some unexpected peripheral districts. It is very unlikely that some “random” peripheral districts are somehow desirable for the young migrants. The key for this puzzle is Russian huge institutional population. By the term of institutional population we use to mean soldiers, prisoners, term workers, special hospitals’ patients. Young age profile is also typical for such migration streams. Sometimes, as in the case of soldiers, the age distribution is concentrated at certain ages even stronger than is usual for age selectivity of “normal” migration. These “institutional migrants” move involuntary skewing sex-age structures dramatically in the “unexpected” host areas. We are going to investigate the effect of institutional population location using the example of Kaliningrad region, which is a known dislocation place of significant army forces.

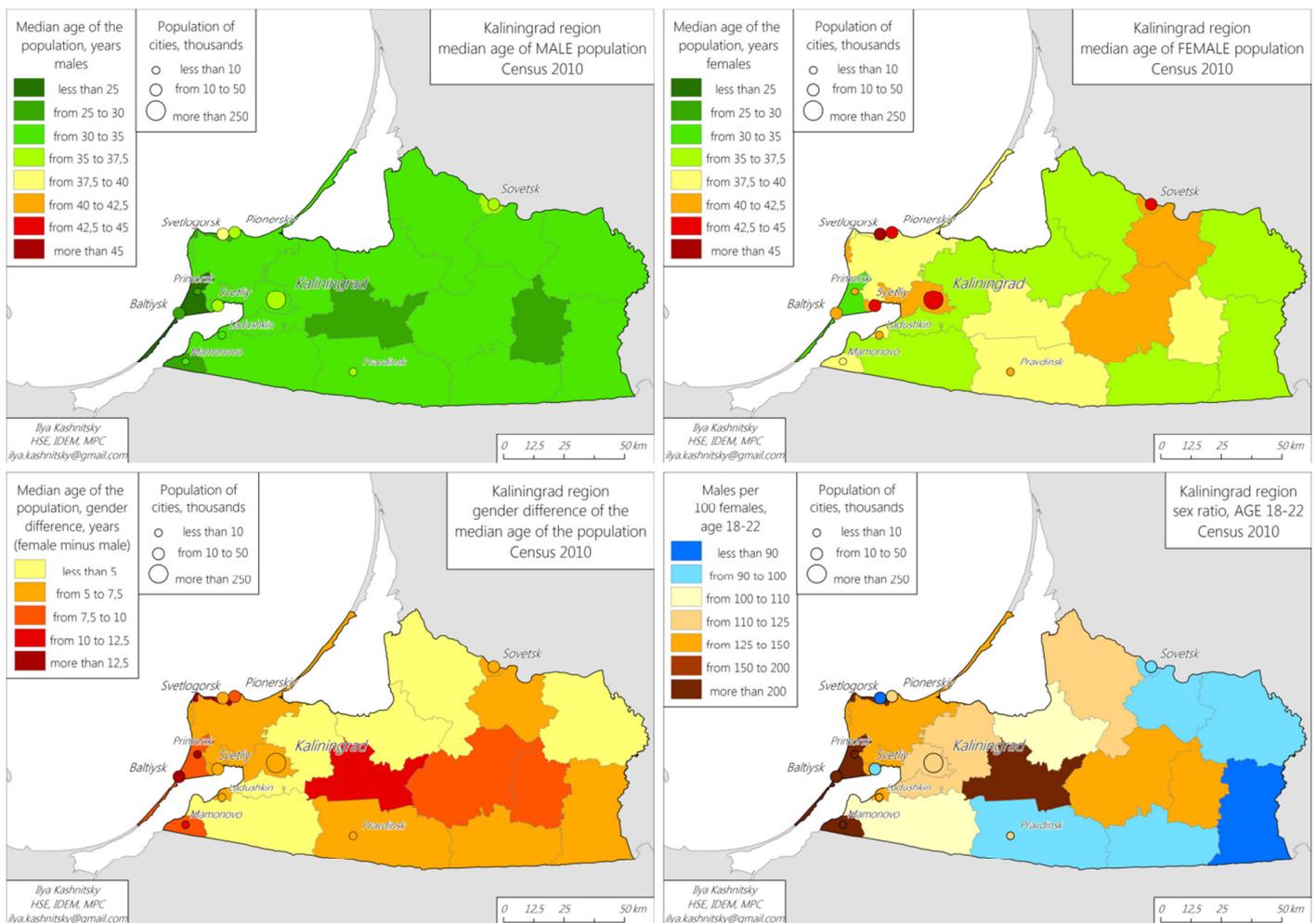


Figure 2. Median age of MALE population, Kaliningrad region, Census 2010.

Figure 3. Median age of FEMALE population, Kaliningrad region, Census 2010.

Figure 4. Gender difference of the median age of the population, Kaliningrad region, Census 2010.

Figure 5. Sex ratio, Kaliningrad region, males per 100 females, Census 2010.

Analyzing the 4 maps of Kaliningrad region, we can see that districts and cities look very similar at all the maps, except for the second one (Figure 3). There are several districts and cities with relatively younger male population (Figure 2). The difference between mean age of females and mean age males is biggest in the same territorial units (Figure4). This big difference is the mark of disproportionately big

share of young males. Finally, the last map (Figure 5) proves that these same districts and cities have noticeable surplus of young males aged 18-22. This observation indicates that the specific demographic structure of the region's population is caused by the relatively big share of young males. Such a big share of young males could only be the result of massive soldiers' relocation to the army units.

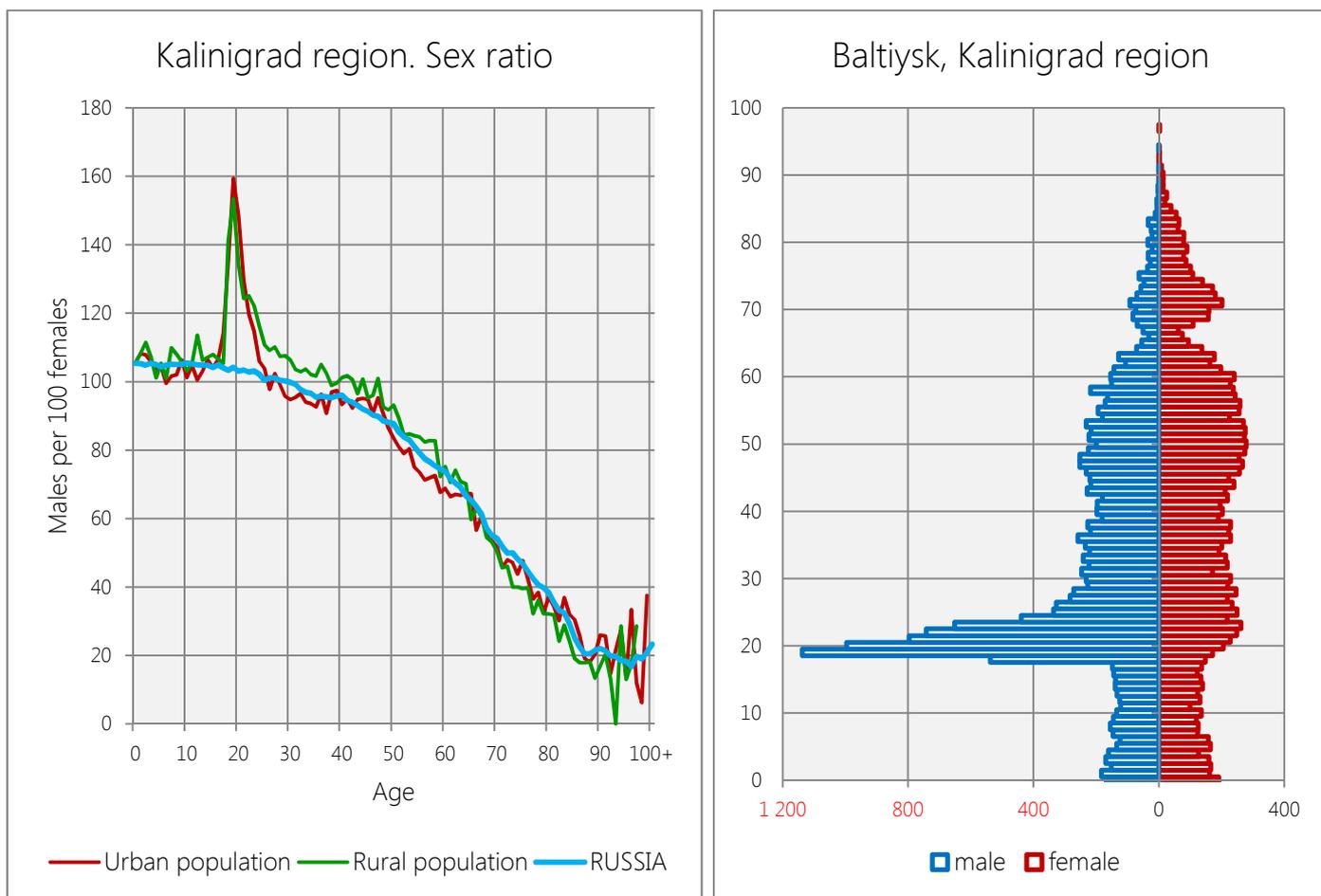


Figure 6. Sex ration for Kaliningrad region, Census 2010.

Figure 7. Demographic structure of Baltiysk, a town in Kaliningrad region, Census 2010.

The both figures (6, 7) above show clearly the impact of young male migration on population composition. The enormous share of young males aged 18-25 is definitely caused by the relocation of army servants.

Army units are not necessarily located in the cities. Therefore, the dislocation of army units brings the systematic disturbance to our hypothesis of cities' migration attractiveness formed earlier. When big share of young population is caused by the migration of institutional population, we cannot claim that this is the result of migration attractiveness of the territory. The phenomenon of institutional population could be a theme for separate research, and we have to consider it as a bias-factor in our research.

### Data and methods

In this paper we present the cohort research on Russian youth intraregional migration. The main method is "survival method" (Wunsch and Termote, 1978; Bogue, 1982) also known in Russia as "method of shifting ages". The prime data source is Russian Census 2002 and 2010 data. We also use current

mortality record to access the impact of mortality on cohort size and current migration record to compare it with our migration evaluations based on Census data.

The natural question is why do we use Census data in this research. The first reason is already mentioned above. Only Census data allows us to analyze spatial mobility of the population at the sub-regional level. But there is another very important reason. It lies in the problems with current migration record that Russian statistics faced after the fall of the Soviet Union. The liberalization of the rules of tabulation by place of residence in Russia caused huge inaccuracy in migration statistics (Чудиновских, 2004). Naturally, the most problematic group proved to be the youths, especially the so called "student ages" (usually at the age of 17-19). Some positive changes in migration record happened only in 2011 which leave the intercensal period internal migration to be verified. The comparison of two main sources of migration statistics brings us new valuable information (read more in Kashnitsky, 2013).

### Estimation of youth intraregional migration

For the deeper research on youth intraregional migration we took 18 regions of Central Federal District (CFD) of Russia. We apply a cohort approach for 5 one-year birth cohorts (1988-1992). Each of these cohorts has experienced the 18-years peak of migration activity during the period between the Censuses 2002 and 2010. At the moment of Census 2002 they were 10-14. Naturally, during the intercensal period they grew older and reached the age of 18-22 ("student" ages) by the Census 2010.

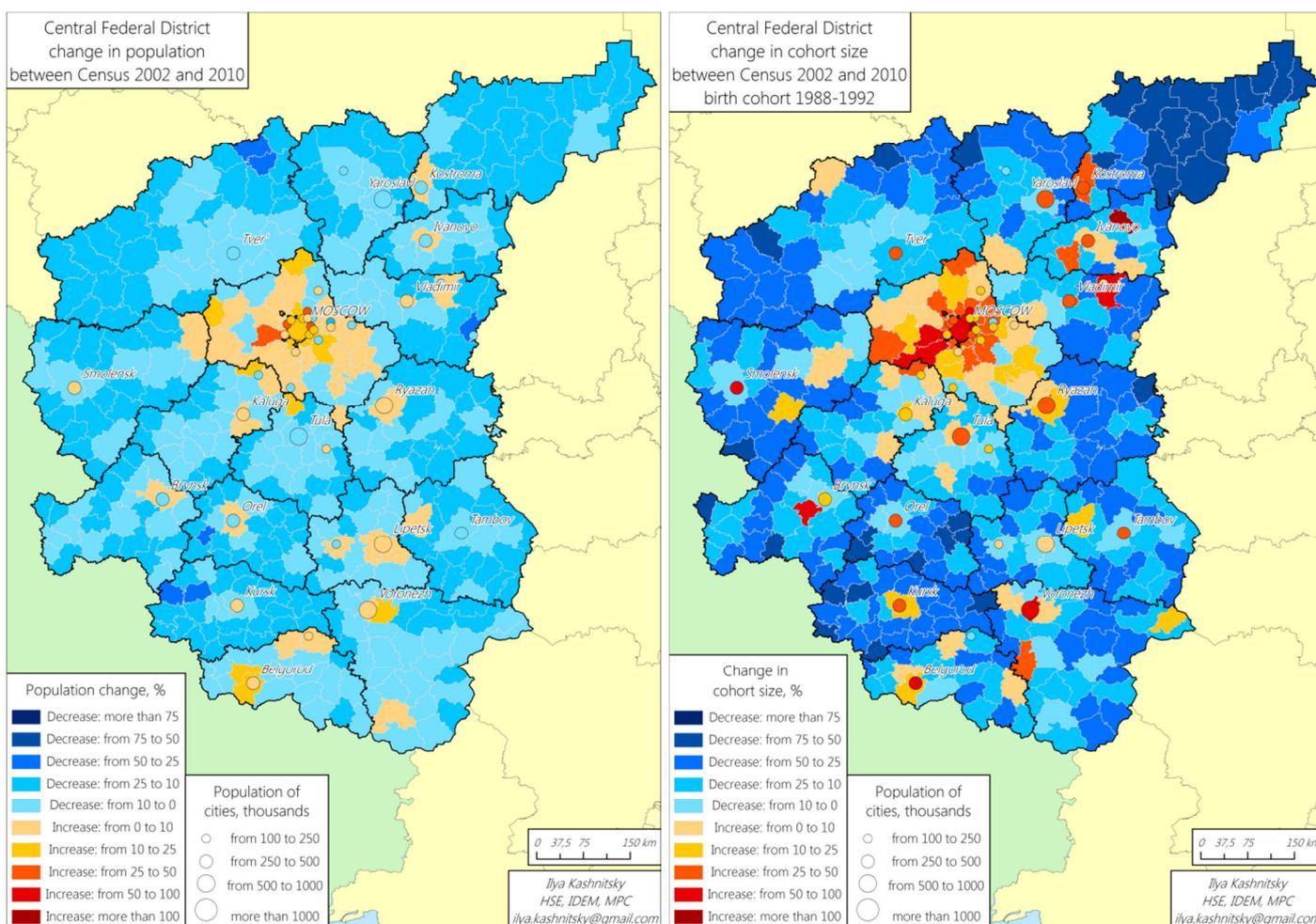


Figure 8. Intercensal change in the share of population aged 16-29, CFD, Census 2002, 2010.

Figure 9. Intercensal change in the size of birth cohort 1988-1992, CFD, Census 2002, 2010.

The scale of the research allows us to look at the intercensus cohort losses of regional periphery by every municipal district. The idea of the method is quite simple. People can live, die or move, not vanish. So we can evaluate the migration balance by the comparison of the Censuses data considering mortality. Here we want to note that these losses are almost precisely migrational. The change in cohort size due to mortality at the ages 10-22 is less than 1 per cent. This method is known as "survival method" or "method of shifting ages".

The picture is really horrible (Figure 9). Up to 70 percent of the youths (cohort 1988-1992) leave the periphery after the school graduation! Compare it to the much more moderate change in the size of the whole population of districts and cities (Figure 8). The urbanization in the Central Russia is still going rapidly. The total population of the CFD has grown only by 1,1 per cent during the intercensus period. The cities with population more than 100 thousand gained 6,1 per cent while the rest of the territorial units, the periphery, lost 5,0 per cent of its population.

Only big cities can attract the youths. When regional centers are relatively small, only the regional center is attractive enough for the young. We can only imagine the future of the population where just 30 per cent of the youths are willing to stay. The hinterland's perspective is not cheerful.

The research for the previous period between two Censuses in Russia (1989-2002) showed that up to 40 percent of school graduates leave regional periphery in the search of better opportunities (Мкртчян, 2012; Мкртчян and Кашницкий, 2013). Our research demonstrates that the migration situation in Russian hinterland is becoming more and more negative.

### ***Do the young movers come back later?***

It is just natural for the young to move from the periphery in search for education and better life opportunities. But the crucial question is whether the young movers come back to the periphery. True, the demographic situation is not so tragic if there is a compensative return migration to the inner periphery. There are several conception of life-circle migration describing the balance of migration between periphery and center though the lifespan of cohorts. We would like to note the "escalator region" concept by Anthony Fielding (Fielding, 1989, 1993). Such concept has a number of evidence from the developed countries. We guess that the key factor here is the stage of urbanization completion. The migration balance between core and periphery is quite similar to the urbanization/suburbanization balance. But in Russia the urbanization is not nearly completed yet. Apart from usual lag in demographic development here we may also see the result of deep agricultural crisis in rural areas after the fall of the Soviet Union. The only analogue of "escalator region" migration in Russia is the life-circle population exchange between Far North and the Southern regions. But this phenomenon is beyond the scope of our research. The whole concept does not work at the interregional level. Hence, we expect to see no significant return of the "post-student" aged population to the inner periphery.

In order to find answer for the proposed question we decided to study the intraregional migration of the birth cohort 1980-1984 (Figure 10). They were in "student ages" at the moment of Census 2002 and grew into young working ages by Census 2010. As we do not have long time series to trace the real cohorts through the "student ages" and on to the young working ages, we are forced to make some synthetic cohort assumptions. We are going to apply survival ratios of birth cohort 1980-1984 in the

2003-2010 intercensus period to our current “students” - birth cohort 1988-1992. In other words, we impose a synthetic cohort assumption due to the data limitations.

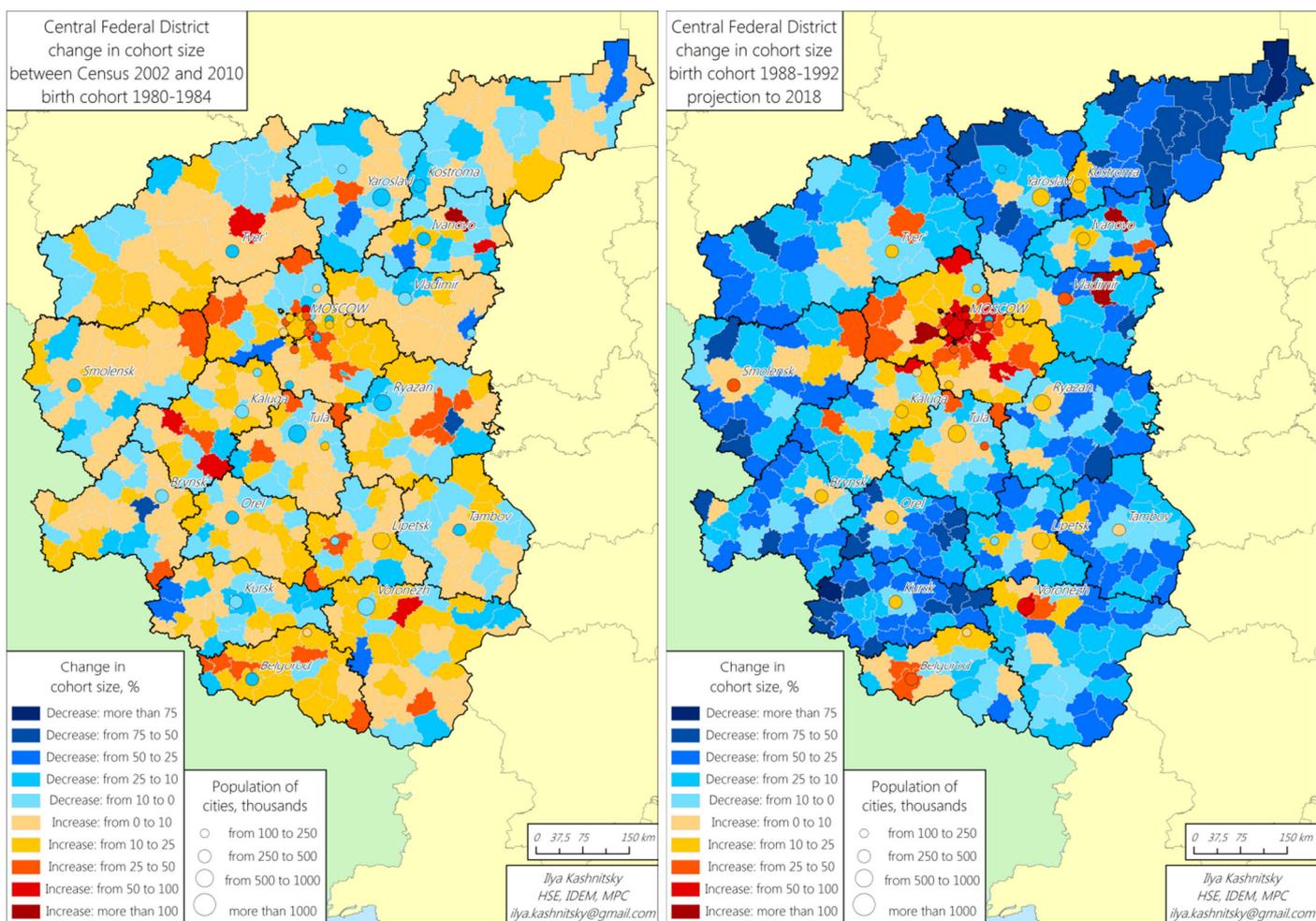


Figure 10. Intercensus change in the size of birth cohort 1980-1984, CFD, Census 2002, 2010.

Figure 11. Projection to 2018 for the birth cohort 1988-1992, CFD, Census 2002, 2010.

The picture (Figure 10) gives us the impression about the return rate of the young movers from periphery. We can see no massive return. True, some peripheral districts experience a slight influx of young migrants. But let us not forget that this inflow of migrants follows a huge out-migration earlier. The most depressive districts continue to sustain serious losses of young population. Interesting remark: it seems like regional centers face surplus of “high school graduates”. They suffer a slight loss of young population in the “post-student ages”.

The projection for the birth cohort 1988-1992 (Figure 11) shows that the summary impact of youth interregional migration is fatal for the inner periphery. The most depressive districts lose young population not only in the “student ages” but also in the “post-student ages”. The size of the original youth cohorts shrinks by more than 70 per cent. Note that the mortality probability for the our cohort during the period 2002-2018 is estimated to be only 2,8 per cent.

We would also like to note that our research showed the increase in “students” centripetal migration comparing with the previous intercensus period. It is likely that the intensity of intraregional centripetal movement in “post-student ages” has also increased. In other words the real cohort depletion of the periphery could turn out to be even more terrible than the projection for the synthetic cohort.

## *Conclusion*

This research focuses on the way the demographic structures form under the influence of migration. In this paper we consider mainly the internal migration (more intraregional, less interregional) as the key factor. The research is held on the level of municipal districts, which allow us to analyze the intraregional migration dynamics.

The impact of long-lasting migration is clearly visible in the demographic structure of the population. The remoteness of the peripheral district determines the level of its depressiveness as well as the attractive power of the center. Every big center of migration attraction forms a depressive ring around itself. This is the result of "migration exhaustion".

Visual analysis of census maps detects some peripheral districts which seem to be unexpectedly attractive for migrants. Closer look on the demographic structure of such districts shows the biasing role of the institutional population.

Cohort research on youth intraregional migration revealed the increase in the intensity of the centripetal movement in the last intercensus period compared to the previous one. The pace of the depopulation in the hinterland is accelerating. The most depressive districts have lost more than 60 percent of school graduates during the last intercensus period. Migration proves to be the main factor of changes in the demographic structures.

There is no compensative return migration of young adults to the inner periphery. Relatively small regional centers face surplus of young adults in the "post-student ages".

## *Literature*

- Bailey, A.J., 1993. Migration history, migration behavior and selectivity. *The Annals of Regional Science* 27, 315–326.
- Bogue, D., 1982. *Techniques of Estimating Net Migration*. Community and Family Study Center.
- Borjas, G.J., 1989. Economic theory and international migration / *Ökonomische Theorie und internationale Wanderung*. *International migration review* 457.
- Castro, L.J., Rogers, A., 1983. What the age composition of migrants can tell us. *Popul Bull UN* 63–79.
- Champion, A.G., University of Newcastle upon Tyne, Department of Geography, University of Leeds, 1998. *The determinants of migration flows in England: a review of existing data and evidence: a report prepared for the Department of the Environment, Transport and the Regions*. Department of Geography, University of Newcastle upon Tyne, Newcastle upon Tyne.
- Coleman, D., 2006. Immigration and Ethnic Change in Low-Fertility Countries: A Third Demographic Transition. *Population & Development Review* 32, 401–446. doi:10.1111/j.1728-4457.2006.00131.x
- Ediev, D., Scherbov, S., Coleman, D., 2013. New measures of population reproduction for an era of high migration. *Population, Space and Place*. doi:10.1002/psp.1799
- Fassmann, H., Munz, R., 1992. Patterns and Trends of International Migration in Western Europe. *Population and Development Review* 18, 457. doi:10.2307/1973654
- Fielding, A.J., 1989. Inter-Regional Migration and Social Change: A Study of South East England Based upon Data from the Longitudinal Study. *Transactions of the Institute of British Geographers* 14, 24. doi:10.2307/622340

- Fielding, A.J., 1993. Migration and the metropolis: recent research on the causes of migration to southeast England. *Progress in Human Geography* 17, 195–212.  
doi:10.1177/030913259301700204
- Filipov, D., Schuster, J., 2010. Effect of Migration on Population Size and Age Composition in Europe. *Vienna Inst. of Demography*.
- Hyrenius, H., 1951. Reproduction and Replacement. *Population Studies* 4, 421. doi:10.2307/2172392
- Kashnitsky, I., 2013. Cohort Research on Russian Youth Intraregional Migration and Education. *Beder University Journal of Educational Sciences* 4, 22–31.
- Massey, D.S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., Taylor, J.E., 1993. Theories of International Migration: A Review and Appraisal. *Population & Development Review* 19, 431–466.
- Millington, J., 2000. Migration and Age: The Effect of Age on Sensitivity to Migration Stimuli. *Regional Studies* 34, 521–533. doi:10.1080/00343400050085648
- Ravenstein, E.G., 1885. The Laws of Migration. *Journal of the Statistical Society of London* 167.  
doi:10.2307/2979181
- Rogers, A., Raymer, J., Willekens, F., 2002. Capturing the age and spatial structures of migration. *Environment and Planning A* 34, 341–359. doi:10.1068/a33226
- Thomas, D.S., 1938. Research memorandum on migration differentials: With contrib. by Rudolf Heberle . A report of the Committee on Migration Differentials, Social Science Research Council: Bulletin 43.
- Willekens, F., 1994. Monitoring international migration flows in Europe. *European Journal of Population/Revue européenne de Démographie* 10, 1–42.
- Wilson, C., Sobotka, T., Williamson, L., Boyle, P., 2013. Migration and intergenerational replacement in Europe. *Population and Development Review* 39, 131–157.
- Wunsch, G.J., Termote, M., 1978. *Introduction to demographic analysis: principles and methods*. Plenum Press.
- Zelinsky, W., 1971. The Hypothesis of the Mobility Transition. *Geographical Review* 61, 219–249.  
doi:10.2307/213996
- Zipf, G.K., 1946. The P1 P2/D Hypothesis: On the Intercity Movement of Persons. *American Sociological Review* 11, 677–686. doi:10.2307/2087063
- Кашницкий, И., 2014. Что в возрасте тебе моем? *Демоскоп Weekly*.
- Мкртчян, Н., 2012. Влияние миграции на возрастной состав населения городов и регионов России: оценка на основе данных переписей населения 1989 и 2002 гг. *Региональные исследования* 66–76.
- Мкртчян, Н., Кашницкий, И., 2013. Стягивание населения с периферии в региональные центры: Россия и Европейский Север, in: *Угорский Проект И Потенциал Ближнего Севера: Экономика, Экология, Сельские Поселения*. Логос, Москва.
- Чудиновских, О., 2004. О критическом состоянии учета миграции в России. *Вопросы статистики* 27–36.

## *Appendix*

The whole gallery of maps (21) can be viewed and downloaded here:

<https://drive.google.com/folderview?id=0B1Cid1hm5YLRNE91Y1F4UHVWU3M&usp=sharing>