THE CAUSES OF REGIONAL POPULATION CHANGE IN RUSSIA: A DYNAMIC PERSPECTIVE

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ABSTRACT

The population crisis in Russia is well documented. While Russia has developed strong socio-economic regional inequalities, one would expect the presence of regional variation in demographic and health profiles as well. This paper sets out to analyse the influence of the socio-economic factors on the marked changes in the population of the federal subjects of the Russian Federation since 1990. The data used is taken from the Russian statistical agency Rosstat for all regions from 1990 till 2009. GLS regression analyses were performed with checks for outliers and autoregressive effects. Several models were run using diverse sets of predictors, splitting the sample by decades (to better understand the changes of the 1990's vs. 2000's), and the trajectories of regional development. We find that cohabitation patterns and economic factors (inequality and living below the poverty line) have the most predominant effects on population change, however, some of the relations are unexpected.

Extended Abstract[1]

Introduction

The population demographic and health crisis in Russia throughout 1990's and 2000's is well-documented by many researchers (e.g. Anderson, 2002; Andreev, McKee, and Shkolnikov, 2003; Brainerd and Cutler, 2005; Eberstadt, 2004; Main, 2006; Shapiro, 1995). It is generally agreed that Russia has experienced "a shock unprecedented in peacetime to its health and demographic profiles" (Tragakes and Lessof, 2003: 10). "Demoscope Weekly" presents the simple Russian demographic arithmetic: according to the statistically generated "Population Clock" in Russia there is 1 birth every 18 seconds and 1 death every 16 seconds (Demoscope Weekly, 2013)[2]. The last year of a positive natural growth (births exceeding deaths) was 1991 (Rosstat, 2011). Up until 2009, the natural decrease in population could not even be fully compensated by the more or less stable immigration.

The causes of this phenomenon, expressed primarily through growing mortality and declining birth rates, have extensively been analysed over the years (Shapiro, 1995; Shkolnikov et al., 1998) and they range from alcohol consumption (Pridemore et al., 2010; Treisman, 2010; Zaridze et al., 2009) to lifestyles (Cockerham, 1997; Cockerham, 2000) and socio-economic factors (Cockerham, 1999; Kislitsyna, 2009). However, if one looks into the literature on socio-economic development of Russia within, i.e. regional[3] and local trends, one would find that transition years were accompanied by rapidly increasing inequality – not only between individuals, but regions as well (Becker and Hemley, 1996; Dolinskaya, 2002; Fedorov, 2002; Hanson and Bradshaw, 2000; Hanson, 2006). Hence, if one agrees that demographic and health crisis is – even if partially – caused by socio-economic and lifestyle factors, and at the same time takes into account the regional inequality in Russia, then inevitably, one has to expect that the demographic and health transition had to be diverse across Russian 83[4] federal subjects.

Analysis of the regional health and demographic differences in Russia has yet to become a truly popular topic among the researchers in the field. Only few studies have been conducted in particular populations and regions (e.g. Shkolnikov et al., 2004; Vlasoff et al., 2008), or analysing the economic determinants of mortality across regions (e.g. Walberg et al., 1998), or structuring demographic regional diversity (Prendergrast, 2004; Rybakovskii, 2010). There is still a need for a comprehensive and systematic analysis of the underlying factors of the changes and variation in population development across regions.

In terms of general population composition, it is well acknowledged that the Russian regions have been very diverse in size and population ever since the times of the Russian Empire and

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[1] Full paper will be submitted for publication and will be later available on request.
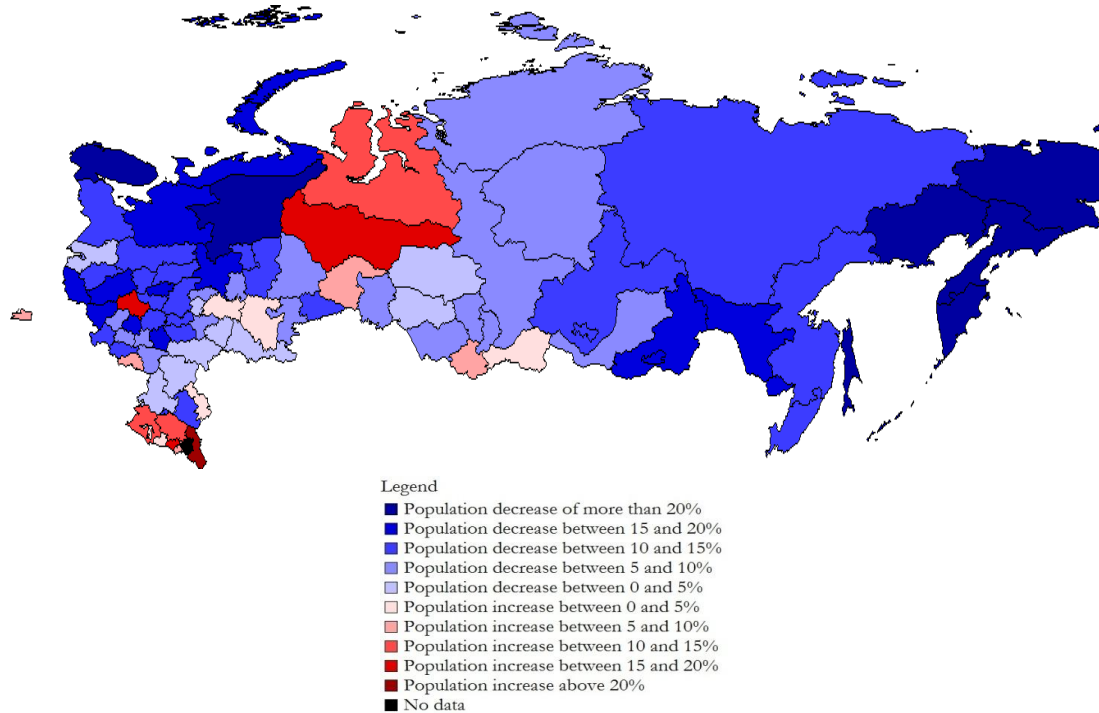
[2] Updated as of December 1st, 2015.

[3] 'Regional' hereafter refers to the main division of the Russian Federation into so-called "federal subjects", not to the particular type of federal subjects.

[4] As of 2015. Originally after the disintegration of the Soviet Union the Russian Federation had consisted of 89 units of federal division, however, some of the federal subjects were merged, resulting in 83 regions. We use the final (latest) federal division throughout the paper.

Soviet Union. But the change in population continued to happen during the recent past as well. Figure 1 shows that there are indeed large differences between the regions in their population development since 1990's. While most of the regions experienced decrease in population between 1990 and 2009, it is evident that there are some areas where the population increased. Hence, the population and mortality crisis might not be the same throughout the whole country. Therefore, it is essential to understand the driving forces of these diverse population changes across regions.

Figure 1. Population change in per cent between 1990 and 2009.

Legend
■ Population decrease of more than 20%
■ Population decrease between 15 and 20%
■ Population decrease between 10 and 15%
■ Population decrease between 5 and 10%
□ Population decrease between 0 and 5%
□ Population increase between 0 and 5%
■ Population increase between 5 and 10%
■ Population increase between 10 and 15%
■ Population increase between 15 and 20%
■ Population increase above 20%
■ No data

NOTE: Change in per cent between years 1990 and 2009.
SOURCE: (Rosstat, 2011)

The paper proceeds as follows. First, we identify more specifically the aims of the paper and proceed to data and methods presentation. Next, the results are briefly described, and finally we conclude with a discussion of our findings.

AIMS OF THE PAPER

This paper is the last in the series of three studies on Russian regional population change. The first paper identified four trajectories of regional population development. The second study analysed the initial conditions at the beginning of transition years – in 1990 - and identified several particularly important factors, which will be incorporated in the present analysis as controls. This paper aims to better understand the changes in regional population development over the transition time.

DATA

The data consisted of time series from 1990 to 2009 on available Russian administrative entities (N=81), and originated from the Russian statistical office Rosstat (2011), earlier

known as Goskomstat. Since the time series were differentiated the maximum number of observations for any variable was 1,539. Due to the smallness of some entities, the Chechen wars, and the difficult and partly chaotic situation in Russia in the beginning of the 1990s, most variables had missing values for 7-17% of the cases, for some, even more.

The dependent variable in the analyses was the proportional annual change in the region's population. The independent variables were as follows:

1. The annual change in the rural population of the region.
2. The annual change in the divorce rate of the region.
3. The annual change in the marriage rate of the region.
4. The annual change in the homicide rate of the region.
5. The annual change in the index indicating the industrial production in the region.
6. The annual change in the unemployment rate of the region.
7. The annual change in the income Gini coefficient of the region.
8. The annual change in the proportion of population living in poverty (= under the official poverty line).
9. The annual change in the abortion rate of the region.

Two variables, the initial values (in 1990) of which, on the basis of our previous analysis, had a significant effect on the regions' subsequently differing population developments, were specially controlled for:

1. The net migration rate of 1990 in the region.
2. The proportion of Muslims in 1990 in the region.

The purpose of the controls was to accommodate this analysis to the previous one by expressing all effects net of those already connected to the start values of some variables. The annual changes in migration rates were not employed as a predictor since they are inherent within the population change. It was not possible to use the annual changes in the proportion of Muslims since data for this variable only existed for 1989 and 2002.

METHODS

The main form of analysis was a GLS regression analysis performed with the help of STATA statistical program. As mentioned above, all variable values (except the initial values controlled for) were differentiated before the regression. After initial regressions, extreme residuals were checked and the observations with those exceeding three standard deviations were excluded – typically around 1,5% of the cases. The main reason for the sometimes very deviant residuals was the small size of some of the administrative entities that made the relative changes in their social characteristics very large. After taking out the outlier cases, the regression was checked for autoregressive effects of the type AR(1). Finally, in order to see whether some variables had more or less effect in regions with specific population developments, the regressions were repeated in the four trajectory groups into which they had been divided on the basis of our previous paper.

RESULTS

An analysis of the simultaneous effects[5] with a model including all of the variables showed that an increase in the proportion of the poor in a region had a strongly positive effect on the population ($p<0.0005$), while the effect of an increase in the value of the gini coefficient (and, thus, an increase in inequality) was negative ($p=0.001$), as was, paradoxically, that of the marriage rate ($p=0.045$). The initial (1990) proportion of Muslims in the region was a strongly positive predictor. Analysed in the trajectory groups with an increasing (at least initially) population development 1990-2009, the proportion of the poor and the gini coefficient both retained their effects. In the groups of regions with decreasing population, even the marriage rate coefficient was close to significance ($p=0.078$) while the unemployment rate had a significant, positive effect.

Since the missing data values reduced the number of years over which a full model could be estimated, a second, reduced model was tried for all the years from 1992, now without abortion, Gini coefficient, the proportion of the poor, and unemployment. In that regression, the effect of the marriage rate was still significantly negative, and that of the Muslims positive. New significant effects were found for industrial growth and the initial migration figures, both of them positive. Repeating this analysis for the trajectory groups only confirmed the strong, negative effect from the marriage rate in both of them.

The analyses opened for the possibility that the effects were in fact varying between different periods. The Russian social history during those years can be roughly divided into the struggling, politically and economically unstable 1990s, and the more stable 2000s. Repeating the regression (with the variables available for respective period) for these decades separately, it transpired that during the 1990s, marriage rate had a strongly negative effect on population, while the divorce rate, industrial growth, initial migration figures, and the initial proportion of Muslims all had strong positive effects. As for the 2000s, the marriage rate again had a strongly negative effect, just like now the industrial growth. The initial proportion of Muslims was again a strongly positive predictor. The Gini coefficient (negative predictor; $p=0.054$) and the proportion of the poor (positive predictor; $p=0.076$) came close to significance with their previous signs. The divorce rate and the initial migration rate were not significant predictors in the 2000s even when tried in the same model as for the 1990s (i.e. without the four variables that were not complete for that period).

Repeating the period-wise analyses in the trajectory groups, the effects for the 1990s of marriage, divorce rates, and industrial growth only reached significance in the group of regions with declining populations, where even the homicide rate was a positive predictor. Among the regions with initially increasing populations, only homicide rate turned up, now as a negative predictor. As for the 2000s, the negative effect of the marriage rate was confirmed within both trajectory groups, and in the group with regions with initially increasing populations, even the homicide rate had a significant negative effect. In the group with regions with declining populations, even the divorce rate (positive), homicide rate (negative),

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[5] These are the only ones reported in this abstract.

unemployment rate (positive), the proportion of the poor (positive), industrial growth (negative), and the initial migration rate(negative) were all significant predictors.

CONCLUSIONS

The analyses showed that the effects of the best variable combinations were much stronger for the 1990s (R^2=0.46) than for the 2000s (R^2=0.23). Furthermore, the best and most consistent predictor overall (disregarding the initial values that were but controls) was the marriage rate, with a clearly negative effect on the population growth irrespective of period. There were also clear indications of a positive effect on population by the proportion of poor persons in the regions after 1997, and negative effects by income inequality and homicide rates during the same period. Furthermore, industrial growth was in several models positively linked to population in the 1990s, but negatively so in the 2000s. The divorce rate was a positive predictor in some models.

Thinking about the mechanisms that could be responsible for the most consistent observed patterns, it is not difficult to assume that increasing economic inequality, while not necessarily indicating poverty, implies an increasing economic competition between the units of consumption (households or individuals), which could well lead to a decrease in the desire to have children (thus influencing the natural growth component of population change) or result in moves from the regions most affected (outmigration). The positive relationship between the proportion of poor and population growth could signal an effect contrary to the previous one: economic stagnation means also more time to other than work-related things, of which children could be the choice of some. Finally, the strong and consistent negative effect between the marriage rate and population change is more difficult to explain. Perhaps, the 1990s brought about a change in the cohabitation patterns. Research on possible lagged effects may yet change the situation if it is assumed that the population effect of marriage would come a little later.

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