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Comparative Analysis of Population Dynamics in Bashkortostan and Tatarstan: The Role of Natural Increase and Migration

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Abstract

The dynamics of regional population figures are of great importance for many aspects of socio-economic development, management, and planning. This study compares demographic trends in two neighboring republics of Russia—Bashkortostan and Tatarstan—which share common historical and cultural backgrounds but demonstrate significant divergences in their population dynamics. The analysis uses official Russian statistics from 1990-2024. Specifically, we utilize fertility, mortality, and migration rates, as well as the official medium-variant population projection by Rosstat. To isolate the impact of natural increase, we constructed an additional zero-migration population projection. We also applied the demographic balancing equation method to estimate net migration. Despite higher fertility rates in Bashkortostan until the late 2010s, Tatarstan's advantage in attracting migrants, coupled with its lower mortality rates, has led to a narrowing of the population size gap between the two regions. According to Rosstat's official projection, Tatarstan may surpass Bashkortostan in total population as early as 2029. In this context of low fertility and comparable mortality levels, migration has become the key driver of population change in both republics, now overshadowing the role of natural increase. These findings highlight the need for an in-depth examination of the underlying causes of the observed demographic differences and the development of measures to improve the situation in Bashkortostan, which is experiencing negative trends. Further analysis of intra-regional variations and the use of alternative data sources, such as mobile phone data or social media activity, are required for a more accurate assessment of migration flows.

Keywords

demography, Bashkortostan, Tatarstan, population size, fertility, mortality, net migration, natural increase, population projection, regional disparities

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Introduction

Population size and dynamics at both regional and national levels are critical indicators for a wide range of socio-economic aspects. These include prospects for economic growth, infrastructure development, urban planning, labor market trends, education, healthcare, social security, and pension systems. Currently, for the Russian Federation, which faces a complex set of acute demographic challenges, the study of regional demography is particularly important. The long-term trend of depopulation, exacerbated by the unprecedented demographic consequences of the COVID-19 pandemic and the impact of the full-scale war against Ukraine, directly affects the country's security, economic stability, and social well-being. Under these circumstances, a comparison of demographic trends in neighboring regions with similar historical and cultural

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characteristics is of particular relevance to researchers and policymakers.

The choice of the Republics of Bashkortostan and Tatarstan for comparative analysis is justified by several reasons. Firstly, these regions are neighbors and share common historical and cultural roots, which makes it possible to minimize the influence of macroeconomic and socio-cultural factors common to Russia as a whole and to highlight regional specifics. Secondly, despite the similarity of initial conditions, in recent decades they have demonstrated a divergence in demographic trends, which makes them ideal objects for studying regional differences in demographic development. Thirdly, understanding demographic processes in these regions is important for the development of effective regional policy, and the results obtained can be extrapolated to other regions of Russia facing similar demographic challenges.

A comparative analysis of Bashkortostan and Tatarstan makes it possible to identify the influence of regional socio-economic and governance factors on demographic processes, largely neutralizing the impact of general macroeconomic and socio-cultural trends characteristic of Russia as a whole. By considering these republics as a kind of "natural experiment," we obtain a unique opportunity for an in-depth understanding of the mechanisms of regional demographic dynamics.

The republics of Bashkortostan and Tatarstan, situated in the Volga Federal District of the Russian Federation, have much in common: they are multi-ethnic regions predominantly inhabited by Turkic peoples who practise Sunni Islam; critically, the economies of both republics rely heavily on oil production and refining, as well as machinery manufacturing and well-developed agriculture (Golosov, 2012). This economic similarity makes it possible to understand demographic differences better than if the economic structures of the regions were radically different.

Despite these similarities, the demographic situations in Bashkortostan and Tatarstan have noticeably diverged over the last decade. Throughout the 1990s and 2000s, Bashkortostan's population consistently exceeded that of Tatarstan, with a tendency for the gap to widen. However, in recent years, the differences in population size between the two republics have considerably narrowed (Figure 1). This convergence in demographic trends warrants a thorough investigation to uncover the underlying factors driving these changes and their potential implications for regional development and policy-making.

However, the significance of this convergence of demographic trajectories goes far beyond the intra-regional context. The observed processes can serve as a kind of "mirror" of all-Russian demographic trends, reflecting the broader challenges facing the country in the context of depopulation and changing migration flows. Moreover, the mechanisms of demographic dynamics revealed in the study, in particular, the increasing role of migration and the differentiation of mortality, may have analogies in other countries facing the consequences of demographic transition and regional disparities. Understanding these processes at the regional level can enrich scientific discussions on national demographic strategies in Russia and international patterns of the relationship between demography, migration, and socio-economic development.

The concept of demographic transition provides a theoretical framework for explaining such demographic transformations (Dyson, 2011). This theory describes the evolution from an initial equilibrium state characterized by high mortality and fertility rates to a new equilibrium with low levels of these demographic processes. As fertility and mortality rates reach extremely low levels, migration becomes the primary factor determining population dynamics, according to the concept.

In this context, major urban areas emerge as the most attractive centers for migrants, contributing to an increase in the level of urbanization. This process involves not only quantitative growth of the urban population in absolute and relative terms but also a qualitative transformation of multiple aspects of social life, affecting both urban and rural areas, while progressing through distinct stages (Gibbs, 1963).

Urbanization and the demographic transition are interrelated and parallel processes, with urbanization being an integral part of economic development and the transition from an agrarian economy to an industrial and, eventually, post-industrial one. As societies progress through these stages, the role of migration in shaping population dynamics becomes increasingly significant, particularly in the context of low fertility and mortality rates (Davis & Henderson, 2003; Dyson, 2011; Easterlin, 2009).

In contemporary Russia, the role of migration in population dynamics is often underestimated. As noted by Coleman (2006), the developer of the theory of the third demographic transition, migration becomes the key factor determining changes in population size and structure when fertility rates reach very low levels. However, Russian regions have not yet fully engaged in active competition to attract international and internal inter-regional migrants, and there is limited awareness of migration as a crucial resource for demographic development. Meanwhile, the sustainability of the demographic situation in Tatarstan and Bashkortostan largely depends on net migration, highlighting the need for a more comprehensive understanding of migration's role in regional population dynamics.

The increasing significance of migration in Russia can be attributed to the persistence of relatively high mortality levels. This is due to the fact that the epidemiological transition in Russia, that is, the process of changing the structure of causes of death, has not been fully completed (Vishnevsky, 2017b). While in developed countries the epidemiological transition is characterized by a decrease in mortality from infectious diseases and the dominance of

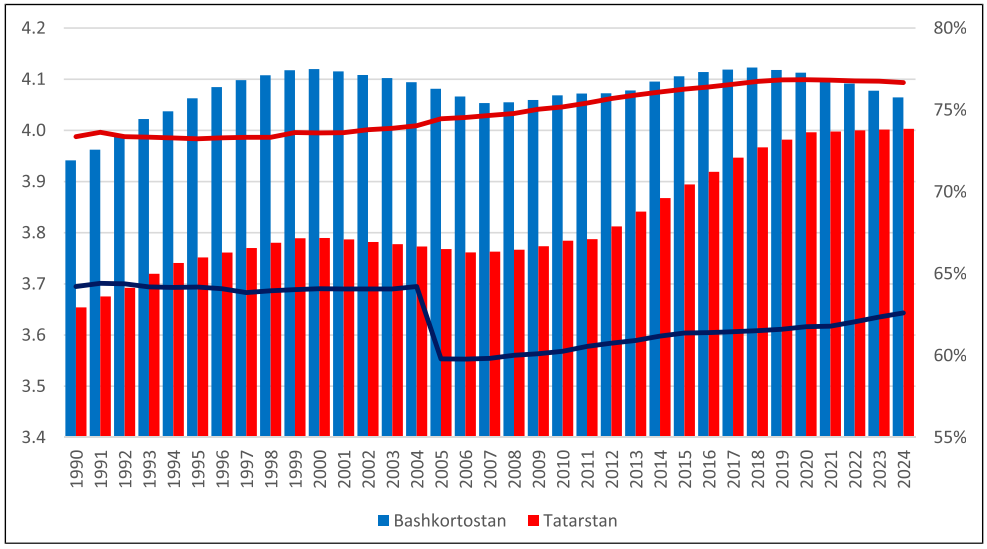

Figure 1. Population Dynamics (Left Scale, in Millions) and Urbanization Rate (Right Scale, %) in Bashkortostan and Tatarstan. Compiled From the EMISS[1]

chronic non-communicable diseases as the main causes of death, in Russia, along with the increase in chronic diseases, a relatively high level of mortality from a number of infectious diseases (tuberculosis, HIV infection, respiratory infections) persists. In addition, a significant problem is the earlier onset of death from cardiovascular diseases and neoplasms compared to Western countries.

In combination with the ubiquitously low fertility rates characteristic of the final stage of the demographic transition, ignoring the migration factor can lead to increased depopulation and economic decline in certain areas, emphasizing the need for a thorough analysis of the interplay between natural population change and migration in shaping regional demographic trends.

This study aims to analyze the contribution of natural population change (births and deaths) and migration to changes in population size in Bashkortostan and Tatarstan for the period from 1990 to 2024. Additionally, we forecast the republics' further demographic development, taking into account existing trends and the potential impact of migration on future population dynamics. By providing a comparative analysis of these two neighboring regions with shared historical and cultural backgrounds, this research contributes to a deeper understanding of the complex factors shaping regional population dynamics in Russia and their implications for socio-economic development and policy-making, and will also allow for the identification of key factors driving the differences in the demographic development of the regions.

Methods and Materials

This comprehensive study of population dynamics in the Republics of Bashkortostan and Tatarstan is based on a thorough analysis of official Russian statistics sourced from the Federal State Statistics Service (Rosstat) and the Unified Interdepartmental Statistical Information System (EMISS). To ensure the robustness and reliability of the findings, a wide range of demographic indicators were utilized, covering the period from 1990 to 2024.

Population dynamics were examined using the annual permanent population figures for both republics as of January 1st of each corresponding year. This approach allowed for a consistent and comparable assessment of demographic trends over the 34-year period. To gain deeper insights into the components of population change, key indicators of fertility, mortality, and migration were analyzed in detail.

Fertility patterns were assessed using the total fertility rate (TFR), a widely accepted and standardized measure of the average number of children born per woman throughout her reproductive life span. The TFR assumes that the prevailing age-specific fertility rates remain constant over time, providing a valuable snapshot of reproductive behavior in the studied regions. By comparing the dynamics of the TFR in Bashkortostan and Tatarstan, the study shed light on the divergences in fertility levels between the two republics and their impact on overall population growth.

Mortality trends were evaluated using life expectancy at birth for both sexes combined, a critical indicator of population health and longevity. Life expectancy at birth represents the average number of years a newborn is expected to live, assuming that the age-specific mortality rates observed in the year of calculation remain unchanged throughout the individual's lifetime. By tracking the evolution of life expectancy in Bashkortostan and Tatarstan, the study identified disparities in mortality levels and their contribution to the narrowing population gap between the regions.

Migration processes were investigated through the lens of net migration and its rate per 1,000 permanent residents. Net migration was defined as the difference between the number of arrivals and departures resulting from both international and inter-regional migration within Russia. The net migration rate provided a standardized measure of the intensity of migration flows relative to the size of the regional populations. By examining the patterns of net migration in Bashkortostan and Tatarstan, the study highlighted the crucial role of population mobility in shaping demographic dynamics and the increasing importance of migration as a driver of population change in the context of low fertility and mortality levels.

To project future population dynamics in the two republics, the study relied on the latest official demographic forecasts released by Rosstat in December 2023. These projections, based on the medium-variant assumptions, provided valuable insights into the expected population trends in Bashkortostan and Tatarstan up to the year 2035. To further explore the impact of migration on population change, the author constructed alternative zero-net-migration projection variants using the DemProj module of the Spectrum software.[2] These projections, employing the cohort-component method and Rosstat's assumptions, allowed for a more nuanced understanding of the potential demographic trajectories in the absence of migration flows.

In addition to the official population projections, the study employed the demographic balancing equation method to estimate net migration following the release of the latest population census results. This method, based on the fundamental relationship between population change, natural increase, and net migration, enabled a more accurate assessment of migration flows in the intercensal periods. By comparing the total population change with the natural increase (the difference between births and deaths), the study derived reliable estimates of net migration, taking into account the greater accuracy of natural increase data compared to migration statistics in Russia (Denisenko & Stepanova, 2013).

It is important to acknowledge the potential limitations and uncertainties associated with the initial statistical data used in this study. In particular, concerns have been raised regarding the accuracy and quality of the 2020 All-Russian Population Census, which was conducted in the autumn of 2021 under challenging circumstances. Expert assessments suggest that the census may have been carried out with significant violations in some regions, potentially compromising the reliability of the obtained data. However, it is generally assumed that the census was conducted more accurately in the national subjects of the Russian Federation, including Bashkortostan and Tatarstan, compared to other regions of the country (Abylkalikov et al., 2023; Andreev & Churilova, 2023).

Despite these limitations, the study's rigorous methodological approach, combining various demographic indicators, population projections, and the demographic balancing equation method, allows for ensuring the robustness and reliability of the obtained results. Through the triangulation of data from various sources and the use of generally accepted demographic methods, the author sought to minimize the potential impact of data inaccuracies and to present a comprehensive and reliable assessment of demographic dynamics in Bashkortostan and Tatarstan.

The methods and materials used in this study reflect the current state-of-the-art in demographic research and are well-suited for addressing the complex interplay of fertility, mortality, and migration in shaping regional population trends. The transparent reporting of data sources, indicators, and analytical techniques enhances the reproducibility and comparability of the findings, strengthening their contribution to the broader scientific discourse on population dynamics and regional development in Russia and beyond.

Results

During the period from 1990 to 2024, the population dynamics in the Republics of Bashkortostan and Tatarstan exhibited markedly divergent patterns, highlighting the complex interplay of demographic processes in these neighboring regions (Figure 1). A striking contrast is observed between the beginning and the end of the study period. At the beginning of the analyzed period, in 1990, the population of Bashkortostan, standing at 3.94 million people, significantly exceeded that of Tatarstan, which had a population of 3.65 million. This substantial gap between the two republics persisted for an extended period, with Bashkortostan maintaining its demographic advantage.

However, starting from around 2010, a notable shift occurred, characterized by a steady trend towards a narrowing of the population gap between the two regions. This convergence in population size has continued unabated, leading to a striking transformation in the demographic landscape of Bashkortostan and Tatarstan. By the beginning of 2024, the difference in population had decreased to a mere 61.3 thousand people, with Bashkortostan having 4.064 million inhabitants and Tatarstan closely following with 4.003 million. This represents a dramatic change from the situation in 2000, when the population gap between the republics exceeded 330 thousand people, underscoring the profound demographic shifts that have taken place in the span of just two and a half decades.

Bashkortostan experienced its peak population size in 1997, reaching an impressive 4.10 million people. However, this demographic zenith was followed by a gradual decline in subsequent years, with the republic's population showing a consistent downward trend. In stark contrast, Tatarstan has witnessed a steady and uninterrupted population growth throughout the entire period under consideration. This sustained increase in Tatarstan's population has been particularly noteworthy, with the republic surpassing the

significant milestone of four million inhabitants during the year 2021. The contrasting trajectories of population change in Bashkortostan and Tatarstan highlight the distinct demographic processes at play in these regions, with Tatarstan demonstrating a remarkable ability to attract and retain population, while Bashkortostan has grappled with the challenges of population decline.

The rapid convergence in population size between Bashkortostan and Tatarstan can be attributed to a complex interplay of multiple factors, encompassing differences in the magnitude and direction of migration flows, variations in fertility and mortality levels, as well as disparities in economic and social conditions prevailing in the two republics. The demographic landscape of Bashkortostan and Tatarstan is undergoing a profound transformation, with the previously substantial gap in population size between these regions rapidly diminishing. This convergence is likely to have far-reaching implications for the socio-economic development, resource allocation, and policy formulation in both Bashkortostan and Tatarstan, necessitating a careful examination of the underlying drivers and potential consequences of these demographic shifts.

Turning our attention to the rural population dynamics, Bashkortostan experienced a notable shift in its urbanization trends. Following a sharp drop in the urbanization rate in 2004, the republic witnessed a subsequent increase, reaching its peak in 2006-2007, with the rural population numbering around 1.64 million people. This unusual pattern can be attributed to the mass abolition of mono-functional urban-type settlements in 2004 and the consequent reclassification of their residents from urban to rural population.

The closure of core industrial enterprises in these settlements precipitated this administrative change, resulting in a significant alteration of Bashkortostan's urban-rural population distribution. Specifically, more than 17 settlements lost their urban-type status during this period. Consequently, only two multifunctional urban-type settlements, namely, Priyutovo and Chishmy, retained their status due to their more developed economic and social infrastructure compared to the other settlements (Safiullin, 2022).

This phenomenon reflects the broader nationwide trend towards a reduction in the number of urban-type settlements in Russia (Karachurina, 2014), highlighting the complex interplay between economic restructuring, administrative reforms, and demographic outcomes. In contrast, Tatarstan has experienced a steady trend towards increasing urbanization throughout the period under consideration. The republic has witnessed a consistent growth in its urban population, accompanied by a corresponding decrease in the rural population. This divergence in urbanization patterns between Bashkortostan and Tatarstan underscores the distinct socio-economic and demographic processes shaping the urban-rural population distribution in these regions.

The observed changes in population size in Bashkortostan and Tatarstan are underpinned by three key components: fertility, mortality, and migration. Fertility and mortality together constitute the natural increase or decrease of the population, while migration encompasses both internal and external population movements. Let us delve deeper into each of these components to gain a more comprehensive understanding of the demographic dynamics in the studied regions.

The dynamics of the number of births in Bashkortostan and Tatarstan are determined by two primary factors—the intensity of fertility, as measured by the total fertility rate (TFR), and the age structure of the population, including the presence of demographic waves and deformations resulting from historical events, such as wars and demographic catastrophes. The profound impact of the First and Second World Wars, as well as periods of famine and other demographic catastrophes, has left indelible marks on the population structure of these regions, creating significant demographic "troughs" that have shaped the number of births and the formation of larger and smaller generations over time (Vishnevsky, 2017a).

Since the mid-2010s, Russia as a whole has entered a new stage of deterioration in its age structure, characterized by the entry into reproductive age of the small cohorts born in the 1990s (Vishnevsky, 2012; Zakharov, 2023). This demographic phenomenon is evident in both Bashkortostan and Tatarstan, as well as in other regions of Russia (Skryabina, 2021). The combined effect of these factors has resulted in a distinctive U-shaped dynamics in the number of births in both republics. Following a sharp decline in the 1990s, a period of growth commenced in the early 2000s, reaching its peak in 2014-2016. However, subsequent years have witnessed a renewed decline in the number of births, a trend that has persisted to the present day.

At the beginning of the analyzed period, in 1990, the difference in the number of births between Bashkortostan and Tatarstan was approximately 7.6 thousand in favor of Bashkortostan. However, by 2022, this gap had narrowed significantly, with the difference reduced to a mere 500 births. This rapid convergence in birth dynamics highlights the increasingly similar demographic patterns emerging in the two republics. Traditionally higher birth rates in Bashkortostan, observed until recently, were likely due to several factors, including a somewhat later entry of the Bashkir population into the demographic transition, as well as their historically lower level of urbanization compared to Tatars (Galeeva, 2013; Valiakhmetov et al., 2024).

However, by 2022, this gap had almost disappeared, which is probably due to the alignment of the pace of demographic transition and urbanization in both regions, as well as general trends in Russia in the change of reproductive behavior. Despite the narrowing gap in recent years, it is important to note that from 1990 to 2022, Bashkortostan recorded a total of 173 thousand more births compared to

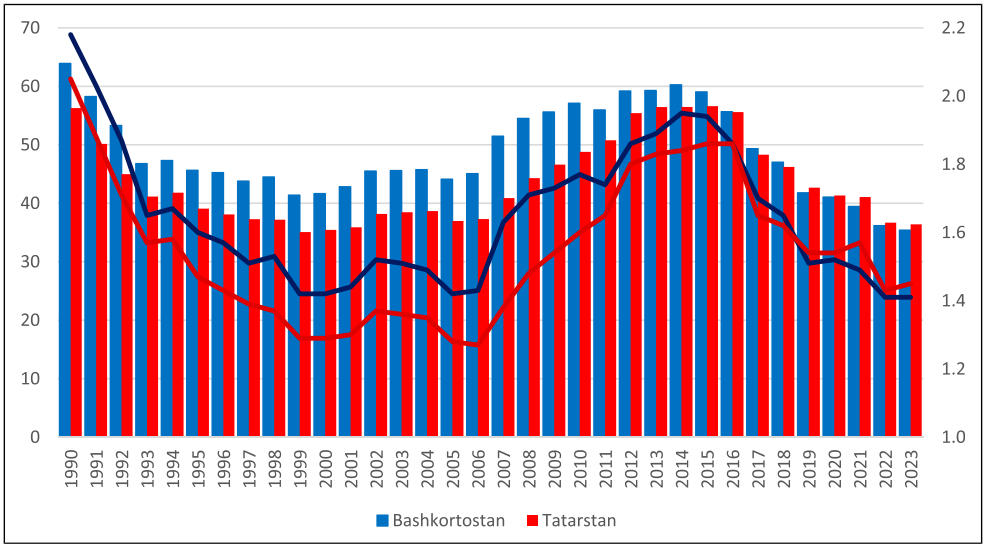

Figure 2. Dynamics of the Number of Births (Left Scale, in Thousands) and the Total Fertility Rate (Right Scale) in Bashkortostan and Tatarstan. Compiled From the EMISS

Tatarstan, underscoring the historically higher fertility levels in the former.

Fertility, as measured by the total fertility rate (TFR), exhibited a consistent pattern in Bashkortostan and Tatarstan from 1990 to 2016. Bashkortostan maintained higher TFR values compared to Tatarstan throughout this period, with the TFR reaching its peak in both republics during the years 2014-2016. Bashkortostan's TFR hovered around 1.9-1.95 births per woman, while Tatarstan's TFR ranged between 1.83-1.86 births per woman during this time frame.

The fertility gap between the two republics typically ranged from 0.1 to 0.2 births per woman of reproductive age for several decades. However, in recent years, Tatarstan has experienced a notable shift, with its TFR values surpassing those of Bashkortostan (Figure 2). This reversal in fertility trends between the two republics is a significant development, indicating the evolving demographic dynamics and the potential for further changes in population growth patterns in the coming years.

In terms of mortality, a contrasting pattern emerged between Bashkortostan and Tatarstan. Life expectancy at birth, a comprehensive indicator reflecting the overall level of population mortality, consistently showed lower values in Bashkortostan compared to Tatarstan throughout the entire period under consideration. This disparity in life expectancy has widened over time, reaching a gap of more than 2 years by 2023, with Tatarstan achieving a life expectancy of 75.3 years, while Bashkortostan lagged behind at 73.2 years. The most pronounced difference in life expectancy between the two republics is observed among the rural population, where the gap has exceeded 2.7 years since 2012 and even reached a staggering 3.3 years in 2015.

The factors contributing to this mortality differential are multifaceted and complex. Socio-economic determinants, such as income levels and educational attainment, play a significant role in shaping health behaviors and outcomes. The influence of lifestyle differences should also not be excluded. Smoking and alcohol consumption, for instance, are more prevalent among individuals with lower socio-economic status, particularly in rural areas. It appears that preventive programs and public health interventions in Tatarstan have been more effective in addressing these risk factors and promoting healthier lifestyles. These initiatives have likely had a positive impact on the overall health of the population and have contributed to reducing social inequalities in access to healthcare services (Denisenko et al., 2022). Addressing the root causes of health disparities and implementing targeted interventions to improve health behaviors and access to care in Bashkortostan could help narrow the life expectancy gap between the two republics.

The mortality differential between Bashkortostan and Tatarstan has been substantial and persistent over an extended period. Starting from 1990, the number of deaths in Bashkortostan exceeded that of Tatarstan by over six thousand people annually throughout the 2000s and 2010s. The cumulative impact of this mortality gap is staggering—from 1990 to 2022, Bashkortostan recorded 180 thousand more deaths compared to Tatarstan. This excess mortality in Bashkortostan has significant implications for population dynamics, as it directly contributes to the slower population growth and the widening gap in population size between the two republics.

The COVID-19 pandemic has had a profound impact on mortality patterns and life expectancy in both Bashkortostan and Tatarstan, as well as in Russia as a whole. During the most severe phase of the pandemic in 2020-2021, substantial changes were observed in these key demographic indicators. In 2020, Bashkortostan experienced a sharp

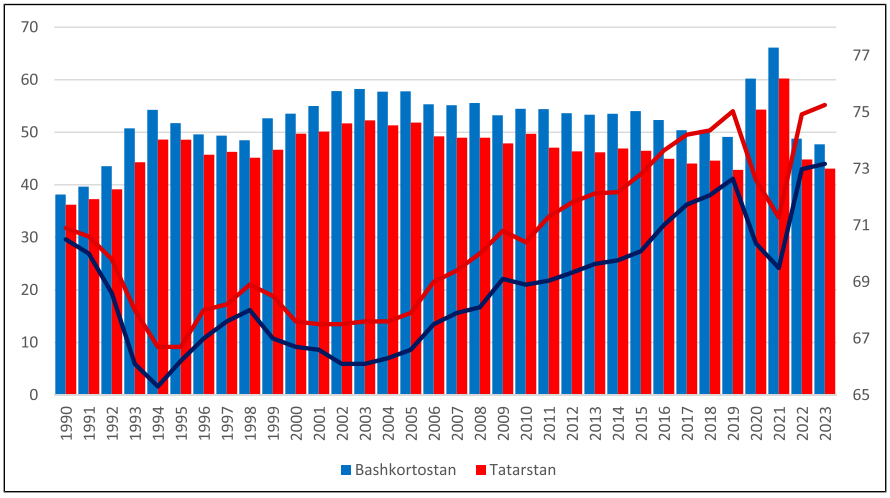

Figure 3. Dynamics of the Number of Deaths (Left Scale, in Thousands) and Life Expectancy at Birth for Both Sexes (Right Scale) in Bashkortostan and Tatarstan, Both Sexes. Compiled From the EMISS

increase in the number of deaths, with an additional 11 thousand people dying compared to the previous year, representing a 22.6% increase.

Similarly, Tatarstan witnessed an increase of 11.5 thousand deaths, or 26.7%, during the same period. It is important to note that, although the statistics on COVID-19 morbidity and mortality in Russia are unreliable, the data on overall mortality, on which our study relies, are considered more reliable. The sharp increase in overall mortality recorded in Bashkortostan and Tatarstan reflects the real negative impact of the pandemic on the health of the population in these regions, and can be extrapolated to the general situation in Russia, where a significant increase in excess mortality was also observed during the pandemic (Aburto et al., 2022; Goldstein, 2021; Yumaguzin & Vinnik, 2023).

The situation further deteriorated in 2022, with Bashkortostan recording nearly 17 thousand more deaths (+28.2% compared to 2019), while Tatarstan saw an increase of 15.4 thousand deaths (+28.4%). These alarming figures underscore the severe toll that the pandemic has taken on population health and the urgent need for effective public health measures to mitigate its impact and support the recovery of life expectancy in the post-pandemic period (Figures 3 and 4).

Substantial differences were also evident in the migration processes experienced by Bashkortostan and Tatarstan. Tatarstan has consistently benefited from a stable net migration gain, driven by an influx of migrants from outside the republic. In contrast, Bashkortostan has long grappled with net migration loss, exhibiting positive values of the net migration rate (per 1,000 population) only in certain years.

It is important to note that the net migration figures presented here are derived using the demographic balancing equation method, calculated as the difference between the total population change and natural increase (decrease). This approach is necessitated by the fact that the Russian statistical agency has not yet recalculated migration estimates to align with the results of the 2020 (2021) population census.

A notable feature of the migration dynamics in both republics is the significant fluctuations observed in net migration figures throughout the analyzed period. Despite these variations, Tatarstan has generally demonstrated higher values of net migration compared to Bashkortostan, indicating its greater attractiveness to migrants.

During the period from 2006 to 2012, Bashkortostan experienced occasional episodes of net migration loss, while Tatarstan enjoyed a steady net migration gain during the same years. This divergence in migration patterns highlights the differing socio-economic conditions and opportunities available in the two republics, with Tatarstan proving to be a more desirable destination for migrants.

Starting from 2014, Bashkortostan witnessed a change in its migration trends, once again recording a positive migration balance. However, the values of the net migration rate, calculated per 1,000 permanent residents, remained noticeably lower in Bashkortostan compared to Tatarstan. This persistent gap in migration attractiveness underscores the ongoing challenges faced by Bashkortostan in retaining and attracting population, even as it experiences a modest improvement in its migration balance.

The COVID-19 pandemic in 2020-2021 had a profound impact on migration processes in both Bashkortostan and Tatarstan. During this challenging period, net migration in both republics increased significantly, reaching the highest levels observed throughout the entire analyzed period. Several factors may have contributed to this unusual surge in migration. Firstly, the economic and social disruptions caused by the pandemic may have prompted a portion of the

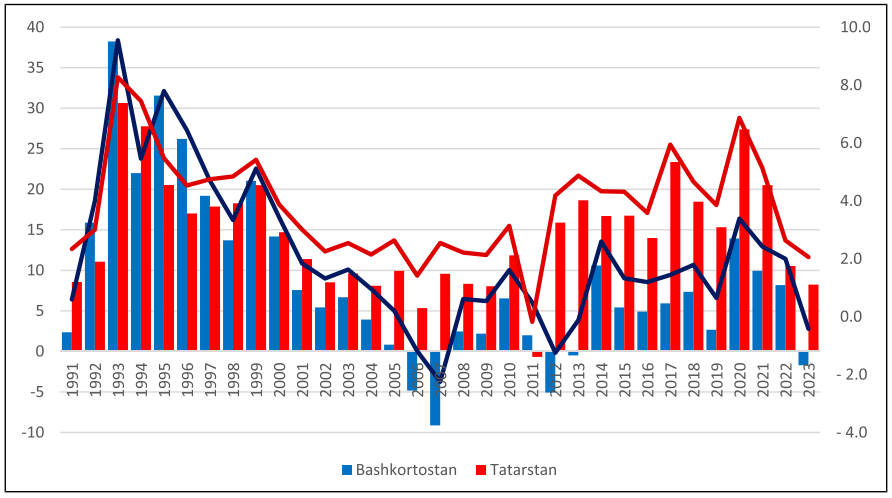

Figure 4. Dynamics of Net Migration (Left Scale, in Thousands) and the Net Migration Rate (Right Scale, per 1,000 People) in Bashkortostan and Tatarstan. Compiled From the EMISS

population to return to their home regions from other parts of Russia and neighboring countries, seeking the support of family networks and familiar surroundings. Secondly, the peculiarities of migration accounting in Russia may have played a role in inflating the net migration figures during this period.

Since 2011, the Russian Federation has included individuals who obtained temporary registration at their place of residence for a period of 9 months or more in the migrant count. This methodological change led to a sharp increase in the officially registered number of migrants. However, upon the expiration of the registration period, these individuals are automatically considered to have departed in the opposite direction. During the pandemic, the impact of such "virtual" departures of migrants to their home regions likely amplified the overall net migration figures (Mkrtchyan, 2020). This statistical artifact should be taken into account when interpreting the migration data during this exceptional period.

According to the latest population censuses, both Bashkortostan and Tatarstan have the closest international migration ties with Uzbekistan, Tajikistan, and Kazakhstan. The number of migrants originating from Ukraine is also significant, with 7.9 thousand in Bashkortostan and 13.2 thousand in Tatarstan. While Tatarstan received fewer internal migrants from other regions of Russia, it attracted a substantially larger number of international migrants, largely due to the return of ethnic Tatars from Central Asia, primarily from Uzbekistan (Abylkalikov, 2016a). In comparison, Bashkortostan experienced a more intensive outflow of population to other regions of Russia, highlighting its challenges in retaining its residents and attracting new migrants.

The interplay of natural population change and migration has had a profound impact on the overall population dynamics of Bashkortostan and Tatarstan over the past three decades. From 1991 to 2022, Tatarstan experienced a natural decrease of 128.4 thousand people, while Bashkortostan witnessed an even larger natural decrease of 141.1 thousand people. However, the migration component played a crucial role in offsetting these losses and shaping the divergent population trajectories of the two republics. During the same period, Tatarstan recorded a migration increase of 474.6 thousand people, significantly surpassing the corresponding figure for Bashkortostan, which stood at 291.4 thousand people (Figures 5 and 6). This substantial difference in migration gain underscores Tatarstan's long-term success in attracting and retaining migrants, which has been a key factor in narrowing the population gap between the two regions.

The contrasting demographic trends in Bashkortostan and Tatarstan have become particularly pronounced in recent years. From 2012 to 2022, Bashkortostan experienced a natural decrease of 43.8 thousand people, while Tatarstan, in contrast, recorded a natural increase of 15 thousand people during the same period. However, the divergence in population dynamics between the two republics is largely attributable to the stark differences in their migration processes.

Over the course of this decade, Bashkortostan's migration increase amounted to 63.4 thousand people, while Tatarstan's migration gain was nearly three times higher, reaching almost 198 thousand people. This striking disparity in migration outcomes has been a decisive factor in shaping the demographic landscape of the two republics, with Tatarstan's ability to attract and retain migrants propelling its population growth and enabling it to close the gap with Bashkortostan.

According to the official demographic forecast compiled by Rosstat, if the current trends in fertility, mortality, and

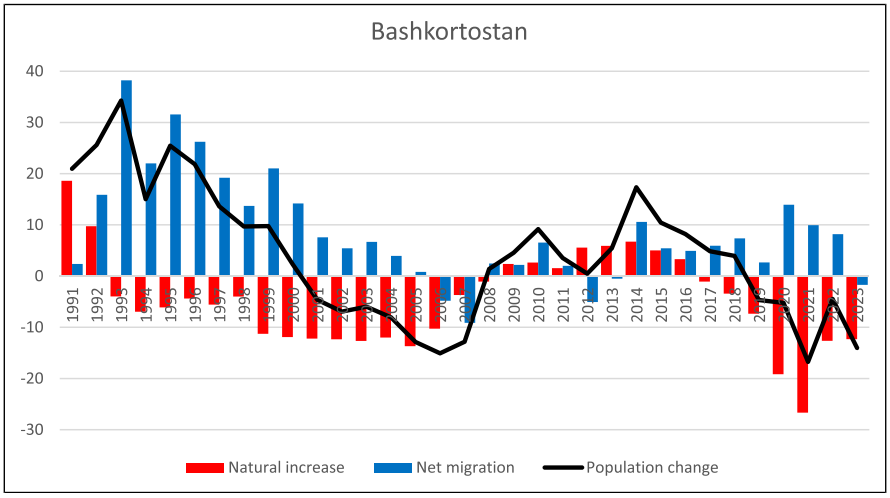

Figure 5. Components of Population Growth in the Republic of Bashkortostan, Thousands of People. Compiled From the EMISS

migration persist, the population of Tatarstan is projected to equal that of Bashkortostan as early as 2029, with both republics having around 3.96 million inhabitants. This remarkable convergence in population size is contingent upon Tatarstan maintaining its advantage in attracting migrants and sustaining favorable demographic conditions (Figure 7).

The projected intersection of the population trajectories of Bashkortostan and Tatarstan marks a significant milestone in the demographic history of these regions, highlighting the profound shifts that have taken place over the past three decades and the potential for further transformations in the years to come.

Throughout the entire post-Soviet period, Tatarstan has consistently demonstrated a greater ability to attract both international and internal migrants compared to Bashkortostan. This success can be attributed to a combination of factors, including more favorable economic conditions, developed infrastructure, availability of employment opportunities, and other advantages that make Tatarstan an appealing destination for migrants.

However, it is crucial to recognize the dynamic nature of migration processes and their sensitivity to various socioeconomic, political, and demographic factors. As such, the observed trend of Tatarstan's migration advantage may be specific to this particular period and is not necessarily guaranteed to persist indefinitely. Moreover, the successful integration and retention of migrants in Tatarstan is an essential consideration. Failing to adequately address the needs of migrant populations and provide them with opportunities for long-term settlement may lead to subsequent outflows, undermining the demographic gains achieved through migration (Abylkalikov, 2016b).

The official Rosstat population projection for the regions of Russia, released in 2023, presents only the medium, most

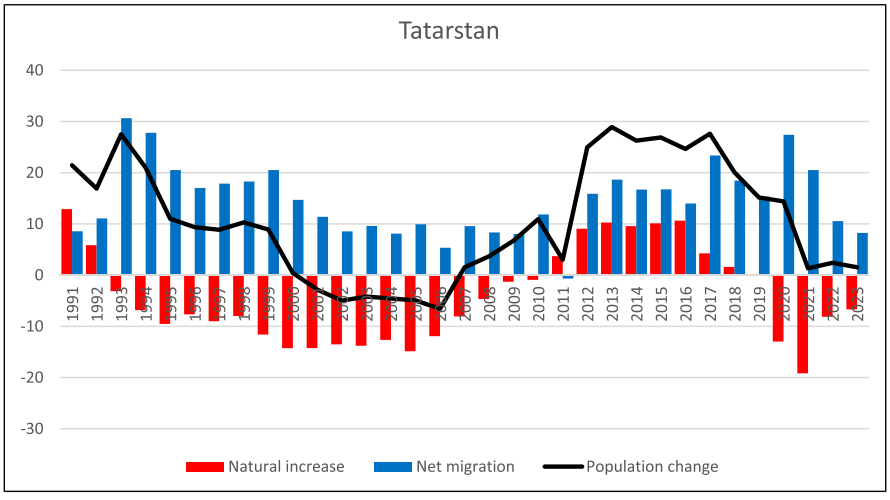

Figure 6. Components of Population Growth in the Republic of Tatarstan, Thousands of People. Compiled From the EMISS

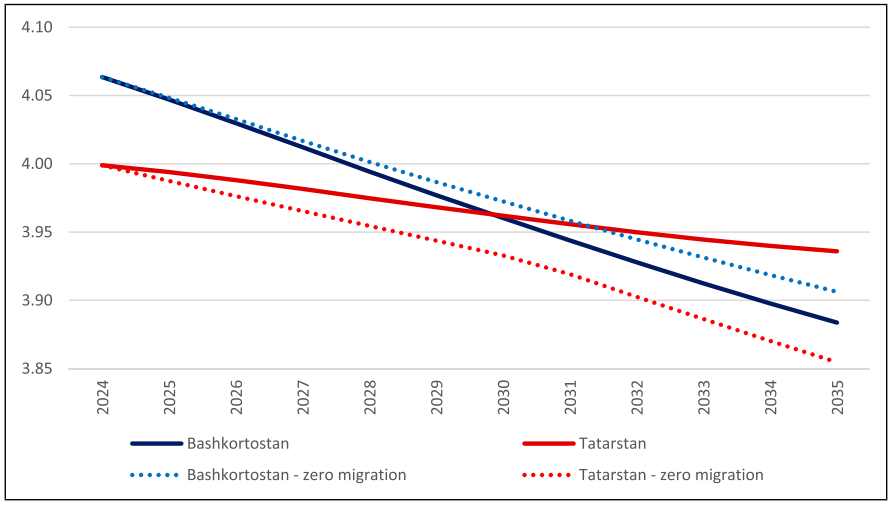

Figure 7. Projected Population of Bashkortostan and Tatarstan, Millions of People. Compiled From Rosstat (2023)

probable variant of the forecast. To complement this official projection and assess the potential impact of changes in birth and death rates on population dynamics, the author has calculated an additional zero-migration variant. This hypothetical scenario utilizes the same assumptions as the Rosstat medium-variant but assumes zero net migration throughout the forecast period. Such zero-migration projections are commonly used by international organizations, such as the United Nations, to provide insights into the demographic futures of countries worldwide (United Nations, 2022).

The results of the zero-migration projection reveal a striking contrast to the official Rosstat forecast. In the absence of migration, the population dynamics of Bashkortostan and Tatarstan exhibit a nearly synchronous pattern, characterized by a steady decline in population size (Figure 7). Under this scenario, Tatarstan is not expected to surpass Bashkortostan in terms of population by 2035 or even 2045. These findings underscore the critical role that migration plays in shaping the demographic trajectories of these republics. The divergence between the official projection and the zero-migration variant highlights the extent to which migration processes can influence population growth and the relative demographic positions of Bashkortostan and Tatarstan in the coming decades.

The comparative analysis of population dynamics in Bashkortostan and Tatarstan has revealed the complex interplay of fertility, mortality, and migration in shaping the demographic trajectories of these neighboring republics. The convergence of population size between the two regions, driven by Tatarstan's advantage in attracting migrants and its success in reducing mortality, has significant implications for their socio-economic development and policy priorities.

In recent decades, Tatarstan has demonstrated a higher migration attractiveness compared to Bashkortostan. This is due to a complex of factors: higher salaries, a developed industrial and IT sector, especially in Kazan, a higher quality of urban and transport infrastructure. The educational component also plays an important role—Kazan Federal University is considered one of the best universities in Russia, while a similar project to create a powerful university center in Ufa started relatively recently (Valiakhmetov et al., 2024).

A key advantage is the active investment policy and the development of special economic zones, such as "Alabuga," "Innopolis," as well as the creation of territorial production clusters. This attracts both Russian and foreign specialists, creating new high-paying jobs. Administrative procedures for migrants in Tatarstan are simpler, and support for entrepreneurship and work with investors are organized more effectively (Kvon et al., 2016).

It is noteworthy that without an active migration inflow, the demographic development of Tatarstan would have been much slower, and the region would have found it difficult to achieve the current population levels comparable to those of Bashkortostan. Migration has become one of the key factors in the republic's demographic growth.

As the demographic landscape continues to evolve, it is crucial to monitor and address the underlying factors contributing to these shifts, while also considering the potential consequences of alternative demographic scenarios. By understanding the intricate dynamics of population change and the role of migration in particular, policymakers and researchers can develop informed strategies to promote sustainable development and address the challenges and opportunities presented by the changing demographic realities of Bashkortostan and Tatarstan.

Discussion

The results of this study reveal significant divergences in the components of population dynamics between the

neighboring Republics of Bashkortostan and Tatarstan over the past three decades. Despite Bashkortostan's higher fertility rates persisting until the late 2010s, Tatarstan's success in reducing mortality and actively attracting migrants has led to a gradual narrowing of the population gap between the two regions.

The findings underscore the critical role of migration processes in shaping the demographic landscapes of Bashkortostan and Tatarstan. Tatarstan has consistently proven to be a more attractive destination for both internal migrants from other subjects of the Russian Federation and international migrants. The reasons behind this trend are likely rooted in Tatarstan's higher level of human development, better economic opportunities, superior quality of life, and more appealing urban environments, particularly in the republic's capital, Kazan, and other major cities. It is likely that the combined impact of these factors, creating a synergistic effect, ensures the high migration attractiveness of Tatarstan. In contrast, Bashkortostan has experienced a substantial outflow of population, primarily to other regions of Russia (Akhmetova, 2022; Turakayev, 2022; Valiakhmetov, 2015).

These findings are important for understanding the general trends of demographic development in Russia. Regional differences in migration processes, identified in the example of Bashkortostan and Tatarstan, reflect the broader problem of uneven population distribution and migration attractiveness of regions in the Russian Federation. Tatarstan's successful experience in attracting and retaining population can be useful for other regions of Russia striving to improve their demographic situation.

The observed differences in migration patterns between the two republics can be attributed to a complex interplay of socio-economic, political, and cultural factors. Tatarstan's success in attracting and retaining migrants may be linked to its more favorable investment climate, innovative economic policies, and proactive measures aimed at promoting social cohesion and cultural diversity. The republic's efforts to create an inclusive and welcoming environment for newcomers, coupled with targeted support for their integration and adaptation, have likely contributed to its positive net migration balance. In contrast, Bashkortostan's less favorable economic conditions, limited job opportunities, and potentially less developed infrastructure and social services may have hindered its ability to attract and retain migrants, resulting in a net outflow of population.

The higher proportion of rural population in Bashkortostan compared to Tatarstan further exacerbates the migration outflow from the republic. As the urbanization process continues to unfold, with Bashkortostan's current urban population share standing at less than 63% (with an additional 4-5% attributed to the population of former urban-type settlements), the republic is expected to experience a prolonged period of rural-to-urban migration. The problem of youth outflow from rural areas is particularly acute. This trend is likely to persist until Bashkortostan reaches the national average urbanization level of 75% (Dyson, 2011; United Nations, 2018). The relocation of the population, particularly the youth, to major cities within Bashkortostan, such as Ufa and Sterlitamak, as well as to urban centers in other regions, including Kazan, Naberezhnye Chelny, Surgut, Nizhnevartovsk, St Petersburg, and Moscow, will largely depend on the relative attractiveness of Bashkortostan's cities compared to alternative destinations.

The findings of this study have significant implications for regional development policies and population management strategies in Bashkortostan and Tatarstan. The observed negative demographic trends in Bashkortostan, characterized by a natural decrease and a net migration outflow, call for a comprehensive reassessment of the republic's socio-economic policies and the development of targeted measures aimed at improving the overall living conditions, creating new employment opportunities, and enhancing the attractiveness of its cities and rural areas. Investing in infrastructure, healthcare, education, and social services, as well as promoting innovation and entrepreneurship, could help Bashkortostan retain its population and attract new migrants, thereby mitigating the adverse effects of depopulation and economic decline.

Tatarstan, on the other hand, should focus on sustaining its positive demographic momentum by further strengthening its migration policies and ensuring the successful integration and adaptation of newcomers. The republic's experience in attracting and retaining migrants could serve as a valuable example for other regions of Russia facing similar demographic challenges. However, it is crucial to recognize the dynamic nature of migration processes and their sensitivity to various socio-economic, political, and demographic factors. The current favorable migration trends in Tatarstan may not necessarily persist in the future, emphasizing the need for continuous monitoring, evaluation, and adjustment of migration policies to maintain the republic's demographic resilience.

The study's findings also highlight the importance of considering territorial differences within the republics themselves when analyzing demographic processes. The situation in specific urban and rural areas may vary substantially, requiring a more nuanced approach to population management and regional development planning. Furthermore, the COVID-19 pandemic has amplified existing demographic disparities, as evidenced by the significant increase in mortality in both republics. The pandemic's impact on migration patterns, particularly the "virtual migration" phenomenon described, also highlights the need for methodological improvements in migration accounting at the national level to ensure accurate demographic data in crisis situations.

Although fertility is undoubtedly a key component of population dynamics, this study intentionally focuses on migration and mortality as the key factors of regional demographic differences in the context of relatively low fertility, which is characteristic of both republics and Russia as

a whole. A sustained and significant increase in fertility in the Russian regions seems unlikely in the short and medium term. It is expected that the total fertility rate (TFR) in the foreseeable future will be similar to the current values and will remain in the range of 1.2-1.6, which will not lead to fundamental changes in the demographic trajectories of the regions in comparison with neighboring territories with a similar level of fertility. This is especially true in comparison with the more immediate and significant impact of the differentiation of migration and mortality.

Traditional Russian demographic policy has largely focused on measures to stimulate fertility, especially financial instruments, such as the maternity capital (Elizarov, 2019; Vakulenko et al., 2024), with very limited demonstrated success. In the current socio-economic conditions, a transition to a more balanced approach that recognizes the decisive role of migration and mortality reduction is justified. Future research should delve deeper into the territorial differentiation of fertility, mortality, and migration patterns, as well as their underlying drivers, to inform more targeted and effective policy interventions.

It is important to acknowledge the limitations of this study, particularly the potential inaccuracies in the initial statistical data, such as the possible errors in the 2020 All-Russian Population Census. These limitations should be carefully considered when interpreting the results and drawing conclusions. Future research could benefit from the use of alternative data sources, including field studies, sociological surveys, administrative records, and big data from social networks and mobile communications, to validate and complement the findings based on official statistics.

Conclusion

Despite shared historical and cultural roots, a comparative analysis of demographic processes in the Republics of Bashkortostan and Tatarstan between 1990 and 2023 has revealed notable regional differences. While Bashkortostan initially exhibited higher fertility rates, Tatarstan's greater success in reducing mortality and attracting migration has contributed to the convergence of population size, underscoring the significant role of migration in this process.

This study demonstrates the importance of both external and internal migration for regional population growth. The experience of Tatarstan showcases the potential of proactive migration policies in the context of natural population decline, offering valuable lessons for other regions. For the development of effective national and regional demographic strategies, it is important to consider regional demographic specificities. Understanding these specificities is key to formulating effective demographic policy measures at the national level. It is necessary to develop strategies aimed at increasing migration attractiveness and mitigating the consequences of depopulation for the balanced demographic development of the Russian Federation.

To deepen the analysis and confirm the results obtained, it is advisable to conduct further research, including statistical analysis of socio-economic, political, and cultural differences between Bashkortostan and Tatarstan and their impact on demographic processes. Future research should focus on migration processes as a significant factor shaping demographic dynamics, using a broader range of data and qualitative methods for a comprehensive analysis of the factors of migration attractiveness of regions and their influence on demographic development. In the context of low fertility, it is migration that acquires a defining significance for demographic dynamics, necessitating the adaptation of traditional approaches to demographic policy.

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Notes

1. The Unified Interdepartmental Statistical Information System (EMISS) is the official statistical portal of the state authorities of Russia. Access to the statistical portal is currently possible only from Russian IP addresses https://www.fedstat.ru/.
2. Spectrum https://www.avenirhealth.org/software-spectrum.php.

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