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DEMOGRAPHIC DEVELOPMENT OF KAZAKHSTAN'S REGIONS: CURRENT TRENDS AND FUTURE PROSPECTS

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ABSTRACT

Demographic processes are closely linked to economic problems, which is especially evident in the regions of Kazakhstan. Thus, population and labour force development trends are often not considered when developing programmes for the economic development of areas. The purpose of the study is to forecast the demographic situation in the regions of Kazakhstan, taking into account the peculiarities of their socio-economic development. Forecasts of the size and structure of the population are developed based on an analysis of trends in demographic processes and their cause-and-effect relationships with socio-economic processes. Data from the Bureau of National Statistics and the 2021 Population Census were used for calculations. For future calculations of the age-sex structure of the population, the method of moving age groups was used, which allows us to simultaneously take into account the impact of changes in both the age-sex structure of the population and fertility and mortality trends. The main result is the receipt of reliable and high-quality data on the size and composition of the population of the country's regions based on the study and analysis of quantitative and qualitative patterns of phenomena and processes occurring in the age-sex composition of the population. Studying patterns of change in the age and sex structure of the population as a result of fertility, mortality, and migration processes will allow an assessment of the differences that exist at the regional level for regional planning and decision-making on the appropriate allocation of resources in areas such as education, health, and social security.

Keywords: Population, Forecast, Region, Disparity, Macro-region, Kazakhstan

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INTRODUCTION

The modern state and prospects of demographic processes have always aroused and are of increased interest since these changes entail modifications in planning. Already today it is necessary to envisage digressions in the trends of demographic processes that will occur under the influence of various factors: changes in fertility, mortality, population aging, migration, living standards, etc. In the mid-1990s, under the influence of geopolitical, economic, and social processes that led to a sharp decline in living standards, a demographic crisis began in Kazakhstan. Natural population growth was replaced by a reduction due to a decrease in the birth rate and a simultaneous increase in mortality. External migration has intensified. Thus, by 2002, the population in Kazakhstan had decreased to 14,854 thousand people, or by 11% by 1985. By 1999, the number of people born in Kazakhstan had decreased to 217,578, or by 40% by 1990 [1].

Since 2000 beginning, after the transitional economic processes completion, the economic recovery, the socio-economic situation stabilization, and demographic processes have gained positive dynamics: birth rates have increased, mortality rates, including maternal and child mortality, have decreased, and the external migra-

tion outflow has gradually decreased. By 2021, the population has grown by almost 1.3 times compared to the minimum value in 2002. By 2021, the number of births has increased by 2,071 times compared to the minimum of 1999. The maximum number of deaths was observed in 1995 when it amounted to 168,656 people, which is 1.3 times more than in 1990.

The current decade of demographic development in Kazakhstan is associated with the entry into the active phase of reproduction of generations born in the late 1990s and the first half of the 2000s. Taking into account the level of provision of the current young generation with basic social services (education, healthcare), improvement of living standards, and achievement of target indicators of social modernization, population forecasts provide important information about the tasks ahead for society and their scale.

Anticipating future demographic changes is difficult, but extremely important for the social sphere since it is necessary to create resources to be able to cover the future demands of the population. The problem of forecasting the volume of demand for social services is based on three components: population forecasts; forecasts of future demand per capita; planning the number of social facilities to cover future demand.

The purpose of the study is to forecast the demographic situation in Kazakhstan, taking into account the peculiarities of socio-economic development. Forecasts of the size and structure of the population are developed based on an analysis of trends in demographic processes, and their cause-and-effect relationships with socio-economic processes.

MAIN BODY

Background

Population and demography issues have always interested many scientists. In the 20th century, studies of age, sex, and number of indigenous people were presented in the works of Brillinger [2], Wolfenden [3], Keyfitz [4], Pollard [5], Heligman & Pollard [6], and others.

In today's research, several significant topics are being examined. These include population aging and the underlying factors such as birth rate growth, age-related mortality, and migration patterns [7]. Another area of focus is labor migration [8]. Additionally, researchers are studying the trends in the size of multi-generational families, the lives of children from various generations, and the impact of race/ethnicity and education [9].

The demographic situation in the world remains difficult, its severity is associated with uneven demographic processes in developed and developing countries [10]. Currently, many aspects of the current demographic situation are becoming fundamental in determining the prospects for its socioeconomic development, political stability and national security [11]. Demographic factors are of utmost importance to the socio-economic development of the country and the standard of living of the region's population. Unfavorable trends in the demographic sphere increase threats to reduce the quality of life of the population in the regions [12].

In the field of demography, understanding the process of population reproduction relies on selecting and utilizing appropriate indicators. In their study, Conti et al. [13] calculated relative and specialized indicators, which provide insights into population growth and help assess the overall demographic and social well-being of a population. When predicting demographic indicators, it is crucial to scientifically forecast key parameters such as population size, age-sex distribution, fertility, mortality, and migration [14].

Analytical approaches to strategic planning for solving problems in the field of social and medical care often require reliable forecasts, since demand is a key factor in most financial and operational activities in these areas [15].

To solve the problems associated with aging and mortality of the population, numerous methods of modeling and forecasting mortality have been developed in recent decades [16, 17, 18, 19].

Lopaeva notes that the forecasting of demographic processes in its classical form is based on a scientifically based prediction of changes in the main parameters of population movement [20]. The task of socio-demographic forecasting is primarily to study the number and age and gender structure of the population, the factors of its transformation and evolution under the influence of the processes of fertility, mortality and migration.

Most of the current methods of mortality forecasting are extrapolative [21]. These extrapolative approaches use patterns observed in both age models and mortality trends over time and are considered more objective, easy to apply and more likely to lead to accurate predictions compared to explanatory or expert approaches.

For many years, the Lee-Carter mortality prediction methodology has been the reference method for extrapolating mortality [22, 23, 24]. The Lee-Carter model of mortality by age periods decomposes the age-related mortality (recorded) for a certain period for one population into a general temporal trend, age structure of mortality and age differences. Mortality is predicted by extrapolating the overall time trend using standard time series procedures.

Reducing the birth rate in different countries proceeds in different ways. The rate of fertility decline usually accelerates at the beginning of the second phase, and when fertility reaches an intermediate level, the rate usually slows down again according to Alkema et al. [25, 26, 27].

The advantage of the Lee-Carter methodology is that it includes a simple stochastic model with only one time-varying parameter, works relatively well when past trends are linear and can predict changes in the age structure of mortality.

Demographic processes are not only the population reproduction or a change in its size as a result of births and deaths but a whole range of issues related to an increase (decrease) in the life expectancy of the population and migration, as well as the formation of a certain demographic consciousness and behavior [28].

When predicting the prospects of global migrations, it is important to take into account many factors [29]. In matters of fertility, this is the formation of reproductive attitudes and the individual's willingness to have a family [30]. Scenarios for the development of population aging processes largely depend on demographic policy [31].

The cause of predicting demographic processes in modern conditions is that they form the most important part of social proportionality and optimality [32]. Demographic processes are defined as the achievement and maintenance of some optimal level of reproduction of the population, not in the narrow, but in the broad sense, i.e., including the reproduction of qualitative characteristics of the population.

Shouven [33], describing the world's leading trends in demography, notes that demography covers not only fertility, mortality and immigration but also the composition of the population – racial and gender; housing conditions, marriages, divorces, working age, as well as health and disability, taking into account age, gender and nationality. In the study of Denton & Spencer [34], several forecasts based on alternative scenarios of the future for the period from 2051 are proposed.

One of the most reliable forecasting methods is the cohort-component method, which takes into account the population dynamics by age and sex cohorts, as well as fertility, mortality and migration [35]. This approach is used in the annual UN forecasts «World Population Prospects» [36], which provide different growth scenarios: low, medium and high.

Population forecasts can have different goals and consider development aspects. Thus, the ILO [37] and the United Nations Population Fund [38] link population forecasts with the sustainable development goals. Particular attention is paid to employment, migration and gender equality. The World Bank and OECD focus on the relationship between demography and macroeconomic and social factors: income level, urbanization, health care, using scenario modeling to assess labor resources and the burden on social systems. It is important to note the regionally-oriented approach [39]. Regional organizations analyze spatial differences - population growth in cities and depopulation in rural areas. This is especially relevant for Kazakhstan, where there is accelerated urbanization and population migration to large cities - Astana, Almaty and Shymkent.

In Kazakhstan, there are several nationwide studies on forecasting demographic processes, as well as related demand for hospital services, educational organizations, including demographic trends and trends in the use of resources per capita. However, most of the research concerning forecasts from the point of view of business administration focuses on the short and medium term [40, 41]. Criteria and indicators of modernization can be used as a basis for determining the projected needs for social facilities and services [42].

Literature on long-term forecasting of demand for hospitals and educational institutions is generally scarce. However, there are no studies concerning the long-term forecast of regional demand for hospital services, educational institutions, including the impact of demographic changes and various changes in per capita indicators for various types of services. Such types of long-term forecasts are relevant to several tasks of strategic planning in the social and medical spheres.

Methods

The fundamental indicators of demographic statistics include, first of all, indicators of the size and composition of the population, the number of births, deaths, marriages, divorces, the number of arrivals in and out of the country, as well as the number of arrivals and departures within the country and its regions [43]. On their basis, indicators are formed and calculated that make it possible to comprehensively characterize the structure and movement of the population, and socio-demographic processes.

Data on the population by age groups of men and women was initially collected and analyzed for the 17 regions of Kazakhstan and 3 megacities. This analysis included demographic dynamics, age structure, and gender distribution. Based on this information, forecasts were created for each of the 17 regions and 3 megacities, covering the following indicators: population projections for 2025-2050, the number of men by age group, the number of women by age group, the share of age groups in the total population of different regions, and the population by age groups of men and women. The forecasts utilized data from the Bureau of National Statistics of Kazakhstan.

Prospective calculation of the age-sex structure of the population

The main source of data in demographic statistics are population censuses, usually conducted once every 10 years. Population censuses provide the most accurate data on the size and composition of the population, distribution by marital status, place of work and professional composition, as well as a wide range of features necessary for practical needs. A population census is the process of collecting demographic and social data characterizing each resident of a country or territory as of a certain date. In our study population estimates are based on the results of the latest population census - the third since independence, conducted in June-October 2021 (Bureau of National Statistics of Kazakhstan, 2023). For prospective calculations of the age-sex structure of the population, the Shift-Share method was used (Table 1), which makes it possible to simultaneously take into account the influence of changes in both the age-sex structure of the population and trends in fertility and mortality [44, 45].

Table 1 - Algorithm for calculating the population forecast using the age shift method

Age, years x	Population according to the census of the t-th year Sx; t	Survival rate px	Sx; t+1	Sx; t+2	Sx; t+3	etc.
0	So;t	P0				
1	S1;t	P1	S1;t+1 = S0;t*p0			
2	S2;t	P2	S2;t+1 = S1;t*p1	S2;t+2 = S1;t+1*p1		
3	S3;t	P3	S3;t+1 = S2;t*p2	S3;t+2 = S2;t+1*p2	S3;t+3 = S2;t+2*p2	
Etc.						
Note - compiled by the authors						

When calculating future population size, the following initial data are utilized:

i.The population size at the start of the calculation period, categorized by gender and one-year age groups (from 0 to 100 years). Typically, the age structure of the population is based on census data.

ii.Survival rates for the population, segmented by gender and one-year age groups, with distinctions made between urban and rural areas, as well as survival rates for newborns.

iii.Total fertility rates for women aged 15–49, organized into one-year age groups and differentiated by urban and rural areas. Age group movements are analyzed separately for men and women, as well as for rural and urban populations.

The age shift technique operates as follows: At the start of year t, the population size for each age group is multiplied by the corresponding survival rate. This calculation yields the population size for individuals aged x+1 at the beginning of the following year, t+1. This method provides the population sizes for all age groups except those under 1 year old. The general calculation form is:

$$S(x+1,t+1) = S(x,t)*p(x,t)+W(x,t) \quad (1)$$

where W(x,t) is the volume of migration included in the calculation, distributed by gender and age.

Speaking about migration, it should be noted that currently migration exchange does not have a significant impact on the formation of demographic indicators [46].

The forecast carried out based on the age shifting method allowed us to calculate the birth rate, forecast the number of births, and forecast the population size in the republic as a whole until 2050 [43]. In this study, we present forecast data for the regions of Kazakhstan, which determines its novelty as a long-term analysis at the regional level. Its significance for Kazakhstan lies in the fact that the country's regions have very different demographic profiles and dynamics.

Status and tendencies

The conducted analysis of the development of demographic processes in Kazakhstan allowed us to reveal that over the 30 years of independence, Kazakhstan has passed several stages of demographic development. The beginning of independence is associated with the emergence of economic and social problems: a difficult economic situation in the transition to a market economy, a decline in the standard of living of the population and social protection by the state, etc.

During the early years of independence, the Republic of Kazakhstan faced significant demographic challenges. These included a large outflow of people, a decline in the birth rate, and an increase in the mortality rate. As a result, many key indicators across the country were negatively impacted. In fact, between 1992 and 2001, Kazakhstan's population experienced a decline. By the start of 2002, the population had decreased by 1.6 million people, which accounted for a 9.7% decrease compared to the beginning of 1992. The most significant drop occurred between 1994 and 1998 when the population decreased by 1.4 million people or 8.4% over five years.

However, 2002 marked a turning point for Kazakhstan's population dynamics as it began to steadily increase. From 2003 to 2008, the population growth rate experienced annual growth, ranging from 15.7 thousand people or 0.1% in 2002 to 410.9 thousand people or 2.6% in 2008. Starting in 2009 and continuing until 2022, the country's population growth remained stable, with an annual increase of 220-255 thousand people or 1.3-1.5%.

It's important to note that the population dynamics across different regions and cities of Kazakhstan vary significantly. This has led to a shift in the population distribution throughout the country. Over the years of independence, the southern and western regions have seen a substantial increase in population. For instance, between 1992 and 2022, the population of the Mangistau region nearly doubled. The Atyrau region experienced a growth rate of 46.4%, while Kyzylorda and Turkestan regions saw an increase of approximately one-third (34.1% and 33.3% respectively). Additionally, the population of Almaty grew by 22.7% and Aktobe by 17.5%.

During this period, the central, northern, and eastern regions of Kazakhstan experienced significant population declines. The North Kazakhstan region saw the most substantial loss at 39.6%, followed by Akmola at 31.0%, Kostanay at 29.6%, East Kazakhstan at 22.4%, Pavlodar at 21.1%, and Karaganda at 18.6%. The combined population of these six regions went from 46.5% of the total population in 1992 to 30.9% in 2019, a decrease of 1.5 times.

Since 2008, the urban population has been steadily increasing. However, this growth is primarily driven by three cities under republican subordination. From 1992 to 2022, the population of Astana grew by 3.6 times, Shymkent by 2.5 times, and Almaty by 63.5%. These three cities continue to attract more residents, with their share of the country's total population increasing from 11.1% in 1992 to 21.4% in 2022. Specifically, Astana's share has tripled from 1.8% to 5.9%, Shymkent's share has increased from 2.4% to 5.5%, and Almaty, despite its relatively smaller growth of 63.5%, remains the most populous city with 1,854.8 thousand people in 2019. Almaty's share of the total population of Kazakhstan rose from 6.9% in 1992 to 10.1% in 2022.

Thus, in Kazakhstan, sustainable demographic processes, which are the driving force of economic development, should become one of the priorities of the country's development. The country's adaptation to the current demographic trends and the receipt of demographic dividends will largely depend on the conditions created for a favorable socio-economic policy.

Demographic forecast for regions of Kazakhstan

We made a population forecast for all regions of Kazakhstan. But due to the limited scope of the article, we will provide data on the Akmola region, located around the capital.

The population of the Akmola region for 2020 is 736,735 people. In 2035 it is expected to increase to 908,088 people, and in 2050 the number is projected to reach 1.1 million people. It is expected that by 2050 the population of the Akmola region will reach 1 million 1 thousand people, which is 51.2% higher than 2020.

The number of men in 2020 in the Akmola region is 357,649 people. In 2030, the number of men is expected to increase to 430,559, and in 2050, the number of men is projected to be 576,383.56. Thus, by 2050, the number of men in the Akmola region will increase by 61.1%.

The number of women in 2020 in the Akmola region is 379,086 people. In 2030, the number of women is expected to increase to 400,266.59; in 2050, the number of women is projected to be 538,175.28. Thus, by 2050 the number of women in the Akmola region will increase by 41%. In 2020, the share of men in the Akmola region is 48.5%, and the share of women is 51.4%, in 2050 the share of men will be 51.7%, and women 48.3%.

The dynamics for 2020 show that the population in the age groups from 0 to 15 and from 25 to 59 years is higher, and the number of youth from 19 to 24 is lower, as is the population in the older age groups. According to statistics for 2020, the population in age groups from 0 to 40 is dominated by men, and after 40 years to 100+ the number of women is higher than men. Figures 1 and 2 show the forecast dynamics for men and women by age group until 2050.

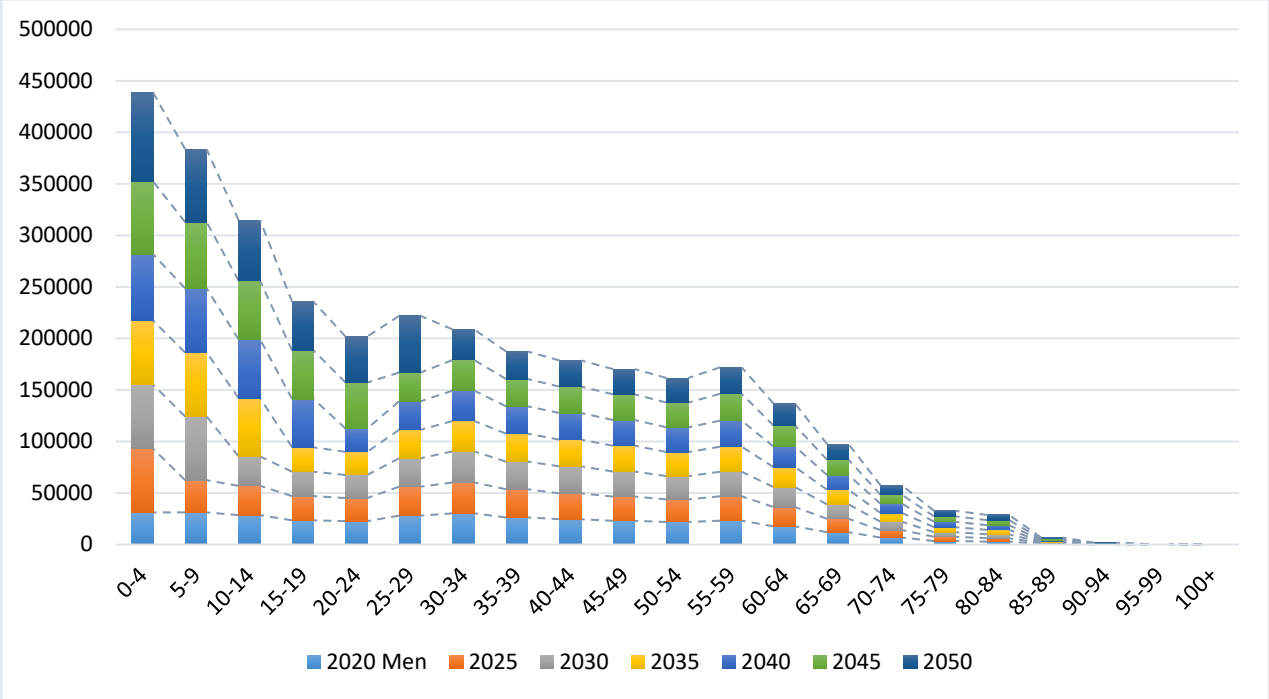

Figure 1 - Forecast of the number of men by age groups up to 2050 in the Akmola region
Note - compiled by the authors based on [1]

The forecast for the number of men in the Akmola region by age group shows that at the age of 0-4 years, the number will increase 3 times. In the age group from 10 to 14 years, the number of males will increase about 2 times. And in the age group of 30-34 years, the number of men in 2050 will be less by 1.8%. Further, the

number of men until 2050 will increase at a moderate pace, namely in the age group from 40-44 years old from 24529 to 25526 people, in the group 45-49 years old it will increase from 22967 to 24507 people. In the age groups 80-84 and 85-89 years, the number of men will double. The forecast for the number of women in the Akmola region by age group shows that at the age of 0-4 years, the number will increase 3 times.

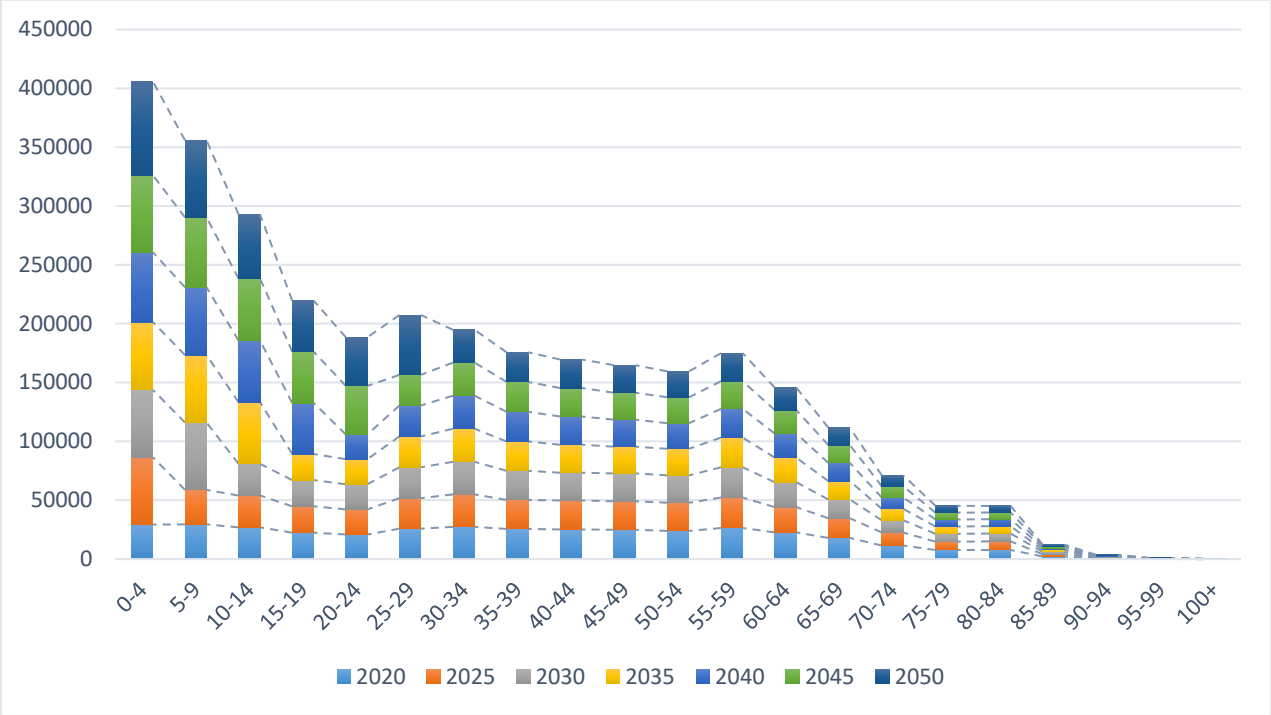

Figure 2 - Forecast of the number of women by age groups until 2050 in the Akmola region
Note - compiled by the authors based on [1]

Further, in the age group of 20-24 years, the number of women will increase only 2 times. In the age group of 35-39 years, the number of women in 2050 will begin to decrease by 1.3%. The forecast trend shows that the number of women in the Akmola region will decrease until 2050. Thus, according to the analysis of the population forecast in the Akmola region, the following conclusions can be drawn:

- the population will increase from 2020 to 2050 from 736,735 people to 1 million 1 thousand people, which is 51.2% higher than 2020.
- the dynamics of the forecast of men in the context of age groups shows an increase of 2-3 times at an early age, and at the age of 30 to 34 a moderate reduction in the number of men, then a growth trend until 2050;
- the dynamics of the forecast of women in the context of age groups shows an increase from 0 to 35 years, followed by a decreasing trend in the number of women until 2050;
- in 2020, the share of men in the Akmola region is 48.5%, the share of women is 51.4%, in 2050 the share of men will be 51.7%, and women 48.3%.

According to this scheme, a forecast was made for the remaining 16 regions and 3 megacities. Due to the limited scope of the article, подробные forecast data can be viewed in the Depository at https://data.mendeley.com/datasets/y98brsjvgp/1.

Discussion

The Center for Labor Resources Development (2021) used aggregated data on macro-regions in conducting the study [47]. Following this approach to identify disparities, we grouped the country's regions into

4 large macro-regions of Kazakhstan, distributed as follows according to their development trends: Center and East, North, West, and South. Data are separately grouped for 3 megacities. At present, we have the following population structure: 32% live in the southern regions of Kazakhstan, 22% in megacities, 16% in the western regions, 14% in the eastern regions, and only 7% in the northern regions.

The implemented population forecast showed a significant decrease in the population in the northern macroregion, with rapid growth in the population of megacities and southern regions (Figure 3).

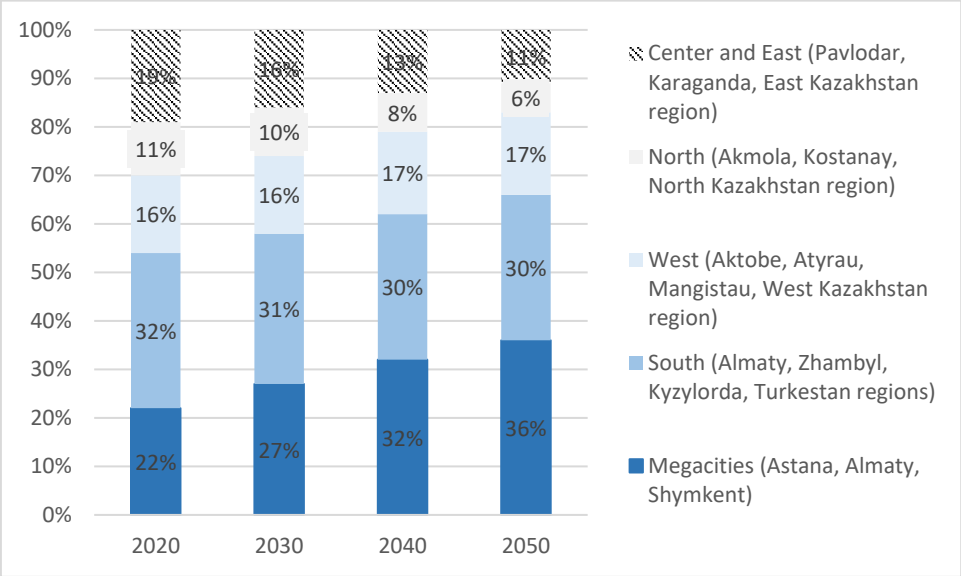

Figure 3 - Forecast of the population by macroregions
Note - compiled based on [41]

Thus, the trends of demographic processes in individual regions largely coincide with macroregional ones. The presented figures clearly show the predicted changes in the territorial structure of the population, including the working-age population (Figure 4) and the labor force (Figure 5). The main trend will be an increase in the population of megacities and a decrease in the population in the northern and eastern regions.

According to the demographic forecast, by 2050, the population of the Republic of Kazakhstan will increase by 7.2 million people, reaching 26 million people. The calculation took into account the high increase in mortality in 2020, mainly in older age groups, and the high birth rate. It is expected that by January 1, 2050, the population of Kazakhstan will reach 25 million 362 thousand people, an increase of 6 million 485 thousand compared to January 1, 2021 (+ 34.4%) The increase in numbers is expected mainly due to the birth rate, which will amount to 12 million 877 thousand people in 2021-2049, while the number of deaths is projected to be 5 million 694 thousand people. The working-age population will grow from 11 million 208 thousand people in 2020 to 14 million 748 thousand people in 2050, or by 32%. The number of people over working age will grow from 2.1 million in 2020 to 3.4 million in 2050, or by 63%, and the share in the population - from 11.2% in 2021 to 13.4% in 2050. The share of the working-age population in 2022-2023 will reach a local minimum of 59.4%, after which it will grow to 61.2% in 2035-2036, and decrease to 57.8% in 2050.

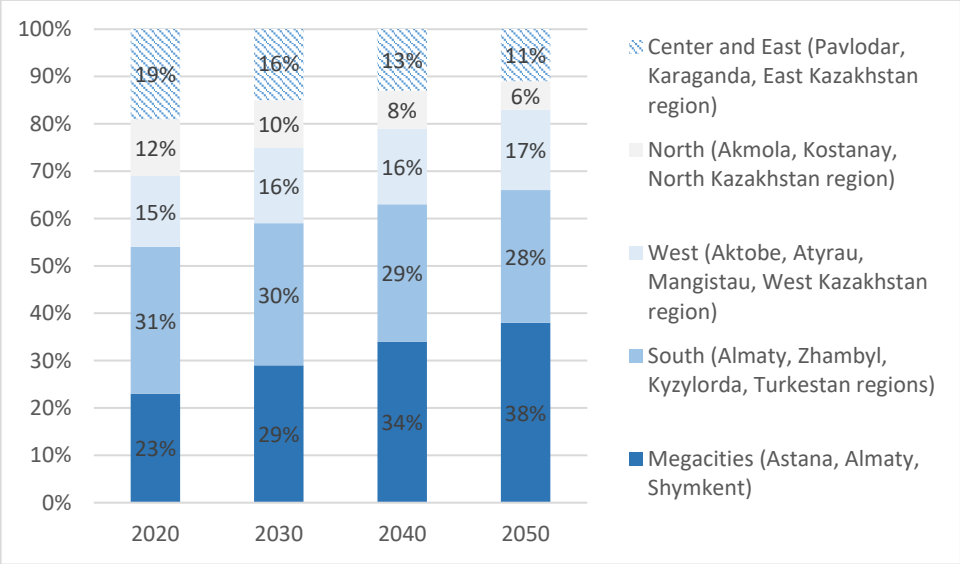

Figure 4 - Forecast of the working-age population by Macroregions
Note - compiled based on [41]

If the economic activity of the population remains at the 2020 level, the labor force is projected to reach 9 million 603 thousand people by 2030. Due to the aging population and high birth rates, the proportion of the labor force in the total population has decreased from 51.7% in 2015 to 49% in 2020, and it is expected to further decline to 46.3% by 2030.

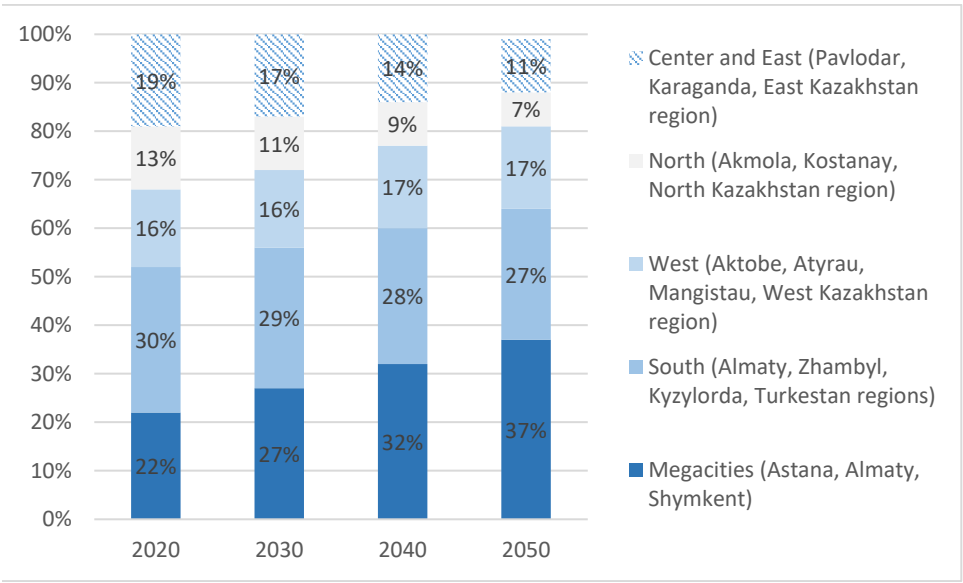

Figure 5 – Forecast of the labor force by macroregions
Note - compiled based on [41]

The main reasons for the anticipated slowdown in labor force growth are as follows:

– The population aged 15-30 is expected to increase by 46,000 by 2025. Within this group, the population aged 15-22 will grow by 25%, reaching 2.3 million, while the population aged 23-30 will decrease by 19%, settling at 1.8 million.

- However, the labor force participation rate will exceed 50% only among individuals aged 22 and older.
- In total, the labor force aged 15-22 is projected to consist of only 412,000 people in 2025, up from 361,000 in 2019. The labor force aged 23-30 will be 1.6 million, down from 2 million in 2020.
- Consequently, the labor force aged 15-30 will decrease by 324,000 people by 2025, representing a 14% decline compared to 2020.

Thus, an increase in the burden on the employed population appears almost inevitable.

The significance of the forecast for the regions of Kazakhstan lies in its ability to identify the asynchronous aging of regions (the south is young, while the north is old). It enables planning for education, healthcare, and the labor market not only at the national level but also for each individual region. Additionally, it allows for the implementation of a targeted social policy, which is particularly important for a large and demographically diverse country like Kazakhstan.

RESEARCH RESULTS (CONCLUSIONS)

The study showed that the results of calculating the prospective population size are influenced not only by the future dynamics of fertility and mortality but also by the age structure of the population. Thus, the change in the number of women aged 15-49 years (especially 20-40 years), associated with fluctuations in the number of births in previous years, will affect the growth or decrease in the number of births and total fertility rates in the calculations for the future. An increase in the number and share of the older population in the total population (the so-called "aging" process of the population) will lead to an increase in the number of deaths and overall mortality rates.

To determine the impact of fertility and mortality on the prospective population, multivariate calculations are made that take into account different levels of population reproduction indicators.

The given system of indicators affecting the demographic allows us to identify the existing demographic potential. Therefore, when predicting fertility and mortality in the future, it is necessary to take into account the features of long-term development and trends in the system of indicators characterizing the current demographic situation that determines the type of reproduction of the population of each region. The given system of indicators affecting the demographic allows us to identify the existing demographic potential. Therefore, when predicting fertility and mortality in the future, it is necessary to take into account the features of long-term development and trends in the system of indicators characterizing the current demographic situation that determines the type of reproduction of the population of each region.

The regional uneven distribution of population will increase without additional measures. By 2050, the population of 8 regions may decrease by 869 thousand people, including the regions of Abay (by 92 thousand), Ulytau (by 15 thousand), as well as Akmola (by 80 thousand), Karaganda (by 99 thousand), Kostanay (by 181 thousand), Pavlodar (by 1000 thousand), North Kazakhstan (by 182 thousand), East Kazakhstan (by 120 thousand) regions. At the same time, the population of other regions may grow by 9 million people, including in the cities of Astana, Almaty and Shymkent by a total of 4.2 million people. In addition, population growth is expected in the following regions: Zhetisu (by 512 thousand), Aktobe (by 326 thousand), Almaty (by 800 thousand), Atyrau (by 350 thousand), West Kazakhstan (by 112 thousand), Zhambyl (by 657 thousand), Kyzylorda (by 328 thousand), Mangistau (by 723 thousand) and Turkestan (by 994 thousand). By 2034, the labor force in Kazakhstan may exceed 10 million people. Due to the influx of the generation born during the baby boom of the 2000s into the labor market, the annual labor force growth rate will accelerate and exceed 1% per year from 2030. By 2050, the workforce may reach 11-12.5 million people. While in several regions (primarily northern, central, and eastern) the workforce may decrease by 25 to 45%, in the cities of Astana and Shymkent it is expected to double.

Thus, today the main tasks of demographic policy should be: stimulating the reproductive activity of the population; stimulating optimal fertility; reducing mortality; increasing life expectancy; helping a woman mother; strengthening and protecting the health of the population; organizing and strengthening the family; regulating internal and external migration.

The development of human resources should be regulated in such a way that the national economy has the necessary and sufficient amount of labor resources for its normal economic development. As ways to achieve this goal, there is a clear tendency to use macroeconomic levers of influence on the human potential of society.

Anticipating future demographic changes is difficult, but extremely important for the social sphere, since it is necessary to create resources in order to be able to cover the future demand of the population. The problem of forecasting the volume of demand for social services is based on three components: population forecasts; forecasts of future demand per capita; planning the number of social facilities to cover future demand. This will be the topic of the next study.

Conducting a population forecast holds significant practical importance. Notably, differences in birth rates and the youth demographic have been identified. In the southern regions (Turkestan, Zhambyl, Almaty), high birth rates and a large proportion of young people are evident. In 10-15 years, we can expect a sharp increase in the number of young people entering the labor market in these areas. Conversely, in the northern and eastern regions (North Kazakhstan, Pavlodar, East Kazakhstan), there are low birth rates and an aging population. Here, forecasts indicate an increase in the proportion of elderly individuals and a decrease in the working-age population.

This suggests that some regions will need to create jobs for young people, while others must focus on developing medical and social services for the elderly. Issues related to urbanization and the age structure of cities have also been identified. In megacities (Astana, Almaty, Shymkent), there is a constant influx of young people from rural areas. The forecast indicates that in 10-20 years, the number of middle-aged families and school-age children will rise in large cities. In contrast, small towns and rural areas are losing their youth, resulting in a growing proportion of elderly residents.

The population forecast enables separate planning for education, healthcare, and pension systems in large cities and villages, rather than adopting a one-size-fits-all approach for the entire country. Additionally, the forecast is linked to the economy and labor market, allowing for predictions about future labor potential in various regions. For instance, in the Turkestan region, there will be an excess of young labor resources in 15 years, while the North Kazakhstan region will face a shortage of workers and middle-aged specialists. Thus, the forecast can inform the redistribution of investments and migration policies within the country.

Moreover, the impact on improving the pension and social system is significant. By accounting for age shifts, we can anticipate which regions will first experience strain on their pension systems. The southern regions remain relatively "young," but over time, aging will become more pronounced as large cohorts reach old age. Consequently, Kazakhstan can develop a differentiated pension strategy by region, considering the varying timelines for "population aging." In summary, demographic forecasting is a crucial tool for strategic planning, allowing countries to anticipate changes in the size and structure of their population, and to assess their impact on the labor market, social services, and sustainable development.

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ҚАЗАҚСТАН ӨҢІРЛЕРІНІҢ ДЕМОГРАФИЯЛЫҚ ДАМУЫ: ӨЗЕКТІ ТРЕНДТЕР МЕН БОЛАШАҚ ПЕРСПЕКТИВАЛАР

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АҢДАТПА

Демографиялық процестер экономикалық проблемалармен тығыз байланысты, бұл әсіресе Қазақстан өңірлерінде айқын көрінеді. Осылайша, аумақтарды экономикалық дамыту бағдарламаларын әзірлеу кезінде халық пен еңбек ресурстарының даму тенденциялары жиі ескерілмейді. Зерттеудің мақсаты олардың әлеуметтік-экономикалық даму ерекшеліктерін ескере отырып, Қазақстан өңірлеріндегі демографиялық ахуалды болжау болып табылады. Халықтың саны мен құрылымының болжамдары демографиялық процестердің тенденцияларын және олардың әлеуметтік-экономикалық процестермен себеп-салдарлық байланыстарын талдау негізінде әзірленген. Есептеулер үшін Ұлттық статистика бюросының және 2021 жылғы халық санағының деректері пайдаланылды. Халықтың жыныстық-жас құрылымын болашақ есептеу үшін жас топтарын жылжыту әдісі қолданылды, бұл халықтың жыныстық-жас құрылымындағы өзгерістердің, сондай-ақ туу мен өлім тенденцияларының әсерін бір уақытта ескеруге мүмкіндік берді. Негізгі нәтиже-халықтың жыныстық және жас ерекшеліктерінде болатын құбылыстар мен процестердің сандық және сапалық заңдылықтарын зерттеу және талдау негізінде ел өңірлеріндегі халықтың саны мен құрамы туралы сенімді және сапалы мәліметтер алу. Туу, өлім және көші-қон процестері нәтижесінде халықтың жыныстық-жас құрылымының өзгеру заңдылықтарын зерттеу аймақтық деңгейдегі айырмашылықтарды бағалауға мүмкіндік берді, бұл аймақтық жоспарлау және білім беру, денсаулық сақтау және әлеуметтік қамсыздандыру сияқты салаларда ресурстарды орынды бөлу туралы шешім қабылдау үшін өте маңызды болып көрінеді.

Түйінді сөздер: халық, болжам, өңір, теңгерімсіздік, макроөңір, Қазақстан

ДЕМОГРАФИЧЕСКОЕ РАЗВИТИЕ РЕГИОНОВ КАЗАХСТАНА: АКТУАЛЬНЫЕ ТРЕНДЫ И БУДУЩИЕ ПЕРСПЕКТИВЫ

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АННОТАЦИЯ

Демографические процессы тесно связаны с экономическими проблемами, что особенно ярко проявляется в регионах Казахстана. Так, тенденции развития населения и трудовых ресурсов зачастую не учитываются при разработке программ экономического развития территорий. Целью исследования является прогнозирование демографической ситуации в регионах Казахстана с учетом особенностей их социально-экономического развития. Прогнозы численности и структуры населения разработаны на основе анализа тенденций демографических процессов и их причинно-следственных связей с социально-экономическими процессами. Для расчетов использовались данные Бюро национальной статистики АСПР и Переписи населения 2021 года. Для будущих расчетов половозрастной структуры населения использовался метод передвижки возрастных групп, позволивший одновременно учитывать влияние изменений как половозрастной структуры населения, так и тенденций рождаемости и смертности.

Основным результатом является получение достоверных и качественных данных о численности и составе населения регионов страны на основе изучения и анализа количественных и качественных закономерностей явлений и процессов, происходящих в половозрастном составе населения. Изучение закономерностей изменения половозрастной структуры населения в результате процессов рождаемости, смертности и миграции позволило оценить различия, существующие на региональном уровне, что представляется очень важным для регионального планирования и принятия решений по целесообразному распределению ресурсов в таких сферах как образование, здравоохранение и социальное обеспечение.

Ключевые слова: население, прогноз, регион, дисбалансы, макрорегион, Казахстан

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