European Journal of Geography Volume 8, Number 3:109 - 125, July 2017

SOCIAL AND GEOGRAPHICAL RESEARCH IN THE REPUBLIC OF KAZAKHSTAN WITH THE USE OF GIS TECHNOLOGIES

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Abstract

The article deals with the dynamics of the main indicators of socio-geographical processes of the Republic of Kazakhstan from 1999 to 2014. The article is based on statistical data from 1999 to 2014 with an emphasis on 1999, 2009 (the first and second censuses of independent Kazakhstan) and 2004, 2014. The territorial analysis of the socio-geographical processes includes such indicators as population size, infant mortality, and life expectancy, the level of health care, education level, and provision of the housing of the population. The main conclusions are: 1. Kazakhstan is characterized by the increase in population due to natural growth and a positive balance of migration; 2. The aging of the population, which led to the increase in the unfavorable side of the indicator of the demographic load and the balance of labor resources; 3. Low life expectancy in comparison with the developed countries; high infant mortality rate. At the same time, Kazakhstan has almost 100% literacy rate of the population and high coverage of the population by education.

Keywords: *Social and geographical indicators, social policy, GIS, regional studies, the Republic of Kazakhstan.*

1. INTRODUCTION

Since declaring the independence of the Republic of Kazakhstan in 1991, the improvement of the quality and standard of living of the population has been the most important task of the state's social policy.

The Republic of Kazakhstan made significant progress in the implementation of the eight Millennium Development Goals. In 2004, our country realized task 1 of the 1st Millennium Development Goal - to decrease twice the share of people whose income is below the subsistence level. Task 2 of the 1st Millennium Development Goal - to reduce by half through the period of 1990-2015 the proportion of people who suffer from hunger - was accomplished. In 2002-2005 task 3 of the 2nd Millennium Development Goal - to provide the access to primary education - was realized (The Millennium Development Goals in Kazakhstan, 2010).

On September 25, 2015 the state - members of the United Nations adopted the agenda for sustainable development till 2030. It contains 17 goals aimed at putting an end to poverty, preserving the planet's resources and providing a high standard of living quality of the population of the entire planet. Putting an end to poverty must be inseparably linked to the implementation of the policies that promote economic growth, and designed to meet a number of social needs in the field of education, health care, social protection and employment opportunities, while addressing the challenges posed by climate change, and the environmental protection (The official website of the United Nations Organization).

In the Republic of Kazakhstan many state programs at the national and regional level, aimed at improving the quality of life were adopted. So, in «Strategic Plan of Development of Kazakhstan till 2020," one of the strategic goals of the country until 2020 is to reduce the proportion of people with incomes below the subsistence level up to 8% (Strategic Plan of Development of Kazakhstan till 2020, 2010).

In the Strategy "Kazakhstan - 2050": a new policy of the established state" it is noted that the questions of social well-being, prosperity, improvement of the welfare of the citizens of Kazakhstan and issues of social support of the population are at the forefront of public policy. At the same time, as it is noted by the President of Kazakhstan Nursultan Nazarbayev, "The most important task of the coming decade is to improve the quality and standard of living of all citizens of Kazakhstan, strengthen social stability and security" (Strategy "Kazakhstan - 2050": a new policy established state", 2010).

In the "Concept of transition of Kazakhstan to sustainable development for 2007-2024», the main priorities are to increase life expectancy, to improve welfare, education and the environment (Concept of Transition of Kazakhstan to sustainable development for 2007-2024, 2006).

Thus, both in the world and in Kazakhstan, the issues of socio-geographical research are very actual. Among the works of foreign authors, which deal with a wide range of issues related to socio-geographical research, the papers by P. Vidal de la Blache, A. Demanzhon (Vidal de la Blache, 1903, Demanzhon 1946-1948) played an important role.

In the Russian science, the first geographical works on population and settlements were written by K.I.Arsenvev, P.P. Semenov-Tyan Shan (Arsenyev, 1841, Semenov-Tyan Shan, 1884).

A significant contribution to the development of the geography of the Soviet population was made by: V.V. Pokshishevsky (general issues, migration) (Pokshishevsky, 1971), G. Saushkin (the study of rural settlements, relationships of man and nature) (Saushkin, 1964), B.S. Khorev (the problems of urban resettlement) (Khorev, 1975), S.A. Kovalev (general issues, geography of rural resettlement, the study of conditions and ways of life) (Kovalev, 1963).

Socio-geographic processes and, in particular, certain demographic and social indicators were reviewed and investigated by the Kazakhstani scientists-geographers: Sh.M. Nadyrov, G.N. Nyussupova, A.Z. Abilov, E.ZH. Imashev (Nadyrov, 2008, Nyussupova, 2010, Abilov, 2013, Imashev, 2011).

Monitoring of the socio-geographical indicators is an essential tool for strategic management of socio-economic development of a particular region and the country as a whole. The choice of strategic priorities of the socio-economic development must be based on the spatial development components, i.e., taking into account their economic and geographical position, the distance to the places of concentration of natural, technical and technological, labor and other resources. Monitoring of the socio-geographical indicators requires appropriate mathematical-cartographic, information-analytical and technological support on the platform of geographic information systems (GIS). The GIS feature consists in the fact that the collection and creation of databases, storage, processing, transformation and

accumulation of information on the socio-demographic and socio-economic state of the region are based on them. The problems related to the strategic management of regions are solved with the help of GIS. Using GIS technology ArcGIS 10 software, the authors created a geographic database of socio-geographical indicators and thematic digital maps on its basis.

2. DATA AND METHODS

When writing the article, the official data of the Committee on Statistics of the Republic of Kazakhstan were served as the information base (The official website of the Committee on Statistics of the Republic of Kazakhstan).

The article is based on statistical data from 1999 to 2014, with an emphasis on 1999, 2004, 2009 and 2014, i.e. the changes for every 5 years are reviewed. In 1999, the first census of sovereign Kazakhstan was held, and then in 2009 when there was the second census since declaring the independence.

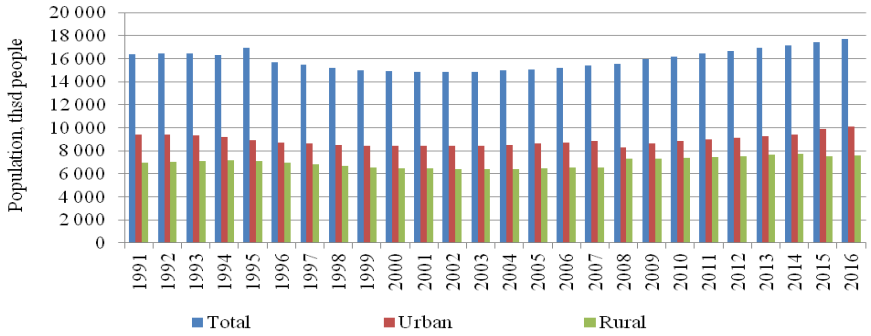
Regional analysis of the socio-geographical processes includes such factors as population, infant mortality rate, life expectancy, the level of health care, the level of education, the housing security for the period of 1999 - 2014 in the Republic of Kazakhstan as a whole, as well as in regions.

The study was based on the methodology of national and foreign geography science. In the paper, both traditional and modern methods of research: a systematic, descriptive, comparative geographical analysis, methods of mathematical statistics, mapping, and methods of GIS technologies and GIS were used. While data processing, software packages ArcGIS, Excel spreadsheets were used.

3. ANALYSIS AND RESULTS

During 1991-2000, Kazakhstan’s population underwent numerous changes. It was during this period that all the negative consequences of the events that took place in the first half of the twentieth century began to affect. An unfavorable demographic situation was noted, which was reflected in the annual decrease in the population size because of the decrease in birth rate, the increase of sickness rate and mortality rate, and the significant migration outflow of the population. The formation of the population is under two factors - natural growth and balance of migration (Nyussupova, et al., 2013).

The population of the Republic of Kazakhstan at the beginning of 1991 was 16,358.2 thousand people, and by the beginning of 2000, it decreased to 14,901.6 thousand people. The significant decrease of the population in the 1990s was related to the departure of the representatives of Slavic and other nationalities for permanent residence in their historic homeland, and the decrease in birth rate. In 2002, the size of the population began to increase and by March 2016, it was 17 713.7 thousand people. The natural growth is the main source of the population increase was Kazakhstan (Figure 1).



Source: Committee on Statistics of the Republic of Kazakhstan

Figure 1. Dynamics of population of Kazakhstan in 1991-2016 years

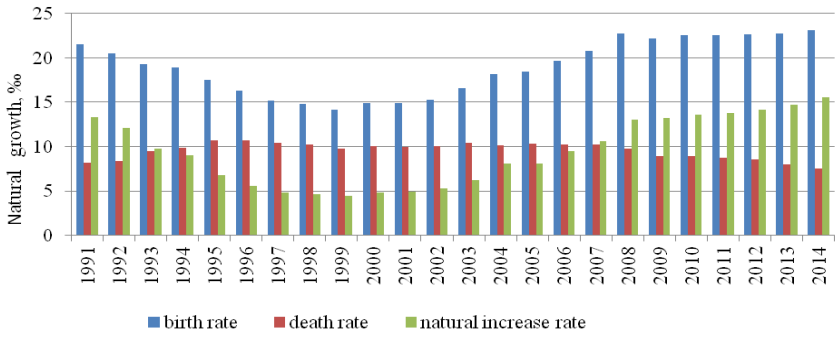
In 2015, the population in Kazakhstan was 17,544.1 thousand people, including urban dwellers - 9967.5 thousand people, or 56.8%, rural - 7576.5 thousand people, or 43.2%. The largest population number is concentrated in the following regions: South Kazakhstan region - 2814.8 thousand people (16%), Almaty region - 1934.7 thousand people (11.0%) and Almaty city - 1672.9 thousand people (9.5%). The smallest population number is in the North-Kazakhstan region - 570.6 thousand people (3.3%), Atyrau region -588.0 thousand people (3.4%) and Mangistau region - 616.8 thousand people (3.5%). For 1999-2014, the population of the republic increased by 2205.6 people. In Karaganda, Kostanay, East Kazakhstan, North Kazakhstan and Pavlodar regions for these years there was the outflow of population and the population in these areas decreased from 139.8 thousand people to 41 thousand people. The largest population growth was in the South Kazakhstan region, its population increased by 839.3 thousand people (Table 1).

Table 1. Population in the regions of the Republic of Kazakhstan in 1999, 2004, 2009, 2014 and 2015 years (thsd. people)

Regions	Years				
	1999	2004	2009	2014	2015
Republic of Kazakhstan	14 955,1	748,9	15 982,3	17160,7	17544,1
Akmola	829,2	671,8	738,8	735,5	740,4
Aktobe	682,5	1571,1	756,7	808,9	828,6
Almaty	1556,5	457,2	1804,0	1984,5	1934,7
Atyrau	439,3	603,8	509,1	567,8	588,0
West Kazakhstan	617,3	985,5	598,3	623,9	633,4
Zhambyl	988,8	1330,9	1020,7	1084,4	1104,8
Karaganda	1411,4	913,4	1341,2	1369,6	1381,5
Kostanay	1020,5	607,4	886,3	880,7	882,5
Kyzylorda	595,5	349,6	677,7	739,7	759,1
Mangistau	314,0	2150,2	482,6	587,4	616,8
South Kazakhstan	1975,5	745,2	2462,7	2733,2	2814,8
Pavlodar	808,3	674,4	742,2	752,7	757,1
North Kazakhstan	727,0	1 455,4	597,5	575,7	570,6
East Kazakhstan	1532,9	510,5	1396,8	1394,0	1395,5
Astana city	326,9	1175,2	605,2	814,4	862,7
Almaty city	1128,9	748,9	1361,8	1507,5	1672,9

Source: Committee on Statistics of the Republic of Kazakhstan

The reason for population decrease in Kazakhstan resulted from a significant migration outflow of the population, which was significantly more than the low natural growth. In 2002, the natural growth of the population of the republic was more than the negative balance of external migration, and since 2004 the population of Kazakhstan has begun to grow because of natural and mechanical growth. The natural growth of the population in 1991 was 13.3%, and then it was followed by a decline in the indicator to 4.7 % in 1999. The decrease in the birth rate during the 1990s in Kazakhstan gave rise to two opposing points of view: 1) the main reason was the economic and political crisis in the country during this period; 2) the decrease in birth rate in the coming years is the continuation of the objective evolution process. Since 1999, the indicators of natural growth of the population have had a positive upward trend, from 1999 to 2014, this indicator increased by 3.4 times from 4.4 % to 15/5%. The total rate of natural growth in Kazakhstan for the period of 1999-2014 was on average: in 1999 - 4.7 %, in 2004 - 8.0 %, in 2009 -13.2 %, and in 2014 – 15.6 % (Figure 2).



Source: Committee on Statistics of the Republic of Kazakhstan

Figure 2. Changes in the natural growth of the population in the Republic of Kazakhstan for 1991-2014 years

In 1999, the lowest indicators of the natural growth were characteristic of Akmola, Karaganda, Kostanay, Pavlodar, North Kazakhstan, East Kazakhstan regions. In 2004, compared with 1999, the average natural growth in the republic increased by almost twice from 4.4 % to 8.0 %. The largest growth was observed in Almaty city and Pavlodar region. Thus, the natural growth in Almaty increased by 9.8 times, from 0.4 % to 8.8 %. In Pavlodar region it increased by 6.6 times, from 0.4 % to 6.4 %. In 2009, the highest indicators of natural growth were in South Kazakhstan (23.5 %), Mangistau (23.3%), Kyzylorda (20.7 %), Atyrau (19.9%) and Zhambyl regions (19.3 %) and Astana (19.1%). While the lowest indicators of the natural growth were registered in North Kazakhstan (1.4%), Kostanay (2.4%), East Kazakhstan (5.1%) and Akmola (59%) regions. In 2014, the natural growth indicator in the country was 15.5%. The lowest indicators of natural growth in the country were observed in North Kazakhstan and Kostanay regions (respectively 2.4% and 3.9%). The high indicators of natural growth were recorded in Mangistau (27.4%), South Kazakhstan (24.3%) regions, Astana city (24.6 %) (Table 2).

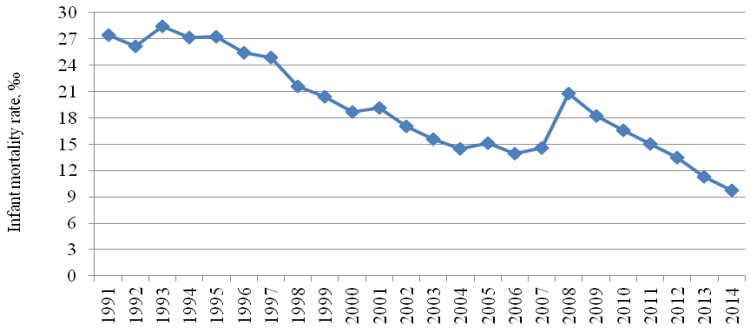
The natural growth of population in Kazakhstan reflects the improvement of material living conditions, health care, and nutrition, working and living conditions of people and so on.

Table 2. Dynamics of indicators of natural growth of the population in the regions of Republic of Kazakhstan in 1999, 2004, 2009 and 2014 years (per 1000 people)

Regions	Natural growth rate, ‰			
	Years			
	1999	2004	2009	2014
Republic of Kazakhstan	4,4	8,0	13,2	15,5
Akmola	0,3	1,8	5,9	7,3
Aktobe	4,1	8,3	13,7	17,2
Almaty	5,5	8,3	15,7	19,2
Atyrau	9,4	12,8	19,9	22,4
West Kazakhstan	0,9	5,8	9,5	11,9
Zhambyl	7,3	12,3	19,3	20,3
Karaganda	0,3	1,4	6,0	8,3
Kostanay	-0,7	0,1	2,4	3,9
Kyzylorda	13,9	15,7	20,7	21,3
Mangistau	11,4	18,9	23,3	27,4
South Kazakhstan	15,8	19,7	23,5	24,3
Pavlodar	0,4	2,6	6,1	7,4
North Kazakhstan	-1,2	-1,0	1,4	2,4
East Kazakhstan	-1,2	0,6	5,17	6,7
Astana city	2,4	8,8	19,1	24,6
Almaty city	0,9	8,8	10,4	11,6

Source: Committee on Statistics of the Republic of Kazakhstan

One of the main demographic indicators that make up the mortality rate is the infant mortality rate (mortality rate of children under one year). Infant mortality rate is the important characteristic of the general state of health and living standards of the population. In the Republic of Kazakhstan, in 1991 the infant mortality rate was 27.4 %, according to the census in 1999 it was 20.4 %. These figures are among the highest ones in the world. In 2004, the infant mortality rate was 14.5 % and in 2014 it was 9.7 %. Thus, for the period of 1991-2014 the infant mortality rate in the country decreased from 27.4 % to 9.7 %, i.e. 3 times (Figure 3).



Source: Committee on Statistics of the Republic of Kazakhstan

Figure 3. The infant mortality rate in the Republic of Kazakhstan in 1991-2014 years

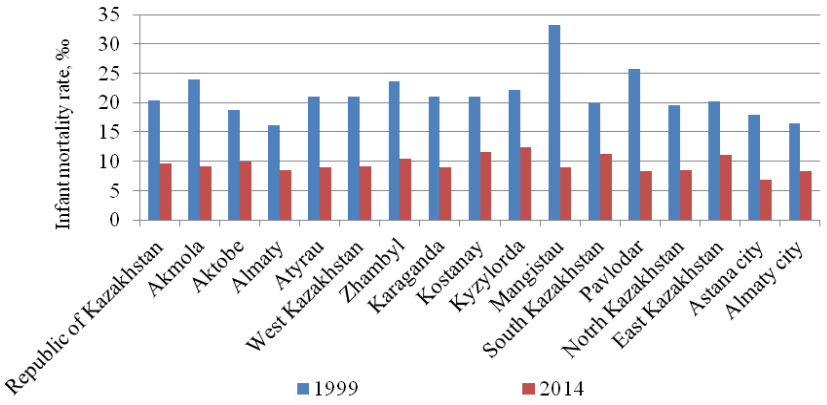
For 1991-2014, the infant mortality rate in Kazakhstan had a stable downward trend. The slight increase in the indicator in 2008 is due to the transition to a new system of registration of newborn death in accordance with WHO recommendations. In 2014, 3,868 infants who

died before reaching the age of 1 year were recorded in the republic i.e. while the infant mortality rate in 2014 was 2.8 times less than in 1991 (9.7 % and 27.4 %, respectively).

Among the causes of infant mortality rate, the state of health in the perinatal period (47%) takes the first place, the second - innate malformations (22%), the third - diseases of the respiratory system (14%) and the fourth - accidents and injuries (8%).

The decrease in the level of the health of women of reproductive age, shortcomings in the work of primary care, in the work of family medical clinics whose task is to improve the health of women of childbearing age, delay in pregnant women registration result in high infant mortality rate.

In the republic in 1999, the highest infant mortality rate was registered in Mangistau (33.2%), Pavlodar (25.7%), Akmola (24%) and Zhambyl (23.6%) regions, the lowest infant mortality rate was observed in Almaty (16.2%), Aktobe (18.8%) regions and in Almaty city (16.5%) and Astana (17.9%). According to the data of 2004, in Kazakhstan as a whole, infant mortality rate decreased up to 14.2%. The high indicators were registered in Kyzylorda (19.5%) and Mangistau (17.9%) regions. Almaty region (11.8%) and Karaganda region (11.9%) region were noted as the regions with the lowest infant mortality rate in 2004. The highest indicators of infant mortality rate in 2009 were in Kyzylorda (24.6%) and East Kazakhstan (22.9%) regions, low indicators were in Almaty region (13.4%) and Astana city (13.6%). In 2014, the highest indicators were in Kyzylorda (12.3%), Kostanay (11.6%), and South Kazakhstan (11.3%) regions. Relatively low indicators were in Pavlodar (8.3%), North Kazakhstan and Almaty (8.5%) regions (Figure 4).



Source: Committee on Statistics of the Republic of Kazakhstan

Figure 4. The infant mortality rate in the regions of Republic of Kazakhstan in 1999 and 2014

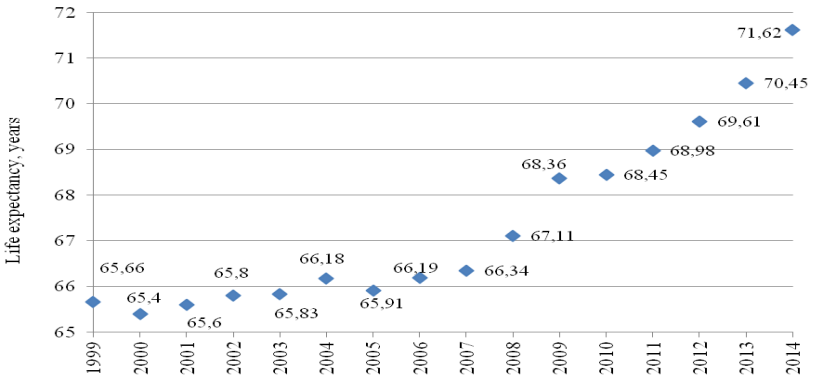
In order to reduce infant and child mortality rate in the Republic of Kazakhstan, the appropriate legislative base was created. The health of a newborn determines the characteristics of the child's further development and their adaptive capacity, sickness rate and the probability of fatal diseases in the following periods of their life. The decrease in the infant mortality rate can be achieved by strengthening and improving the quality of medical care, putting into practice effective programs of WHO and UNICEF, professional development of doctors and nurses, and the application of new perinatal technologies.

The other demographic indicator is life expectancy indicator at the time of birth. It indicates the number of years a newborn will live if the mortality rate, established at the time of his birth, will remain the same throughout his life. Life expectancy is one of the primary quality indicators of health care system in the evaluation criteria of the World Health Organization (WHO). This indicator has a direct correlation with the indicator of total expenditure on health care. The research shows that life expectancy and health of the population depend by 51.2% on lifestyle, by 20.4% - on human biological data, including

heredity, by 19.9% - on the environment and only by 8.5% - on the quality of the public health care, life expectancy of women is almost 10 years more than men's (Abdieva, 2003).

According to the WHO, on a global scale, the top five countries with the highest life expectancy indicators in 2015 are: Japan (83.7 years), Switzerland (83.1 years), Singapore (83.0 years), Australia (82.8 years), and Kazakhstan takes 111 place in the list with indicator of 70.5 years.

According to the Committee on Statistics of the Republic of Kazakhstan in 2014, life expectancy at the time of birth in Kazakhstan increased by almost 6 years compared to 1999 and was 71.62 years, while in 1999, the figure was 65.66 years. The lowest life expectancy indicator in the country in the period of 1999-2014 was observed in 2000, when it dropped to 64.4 years (Figure 5).



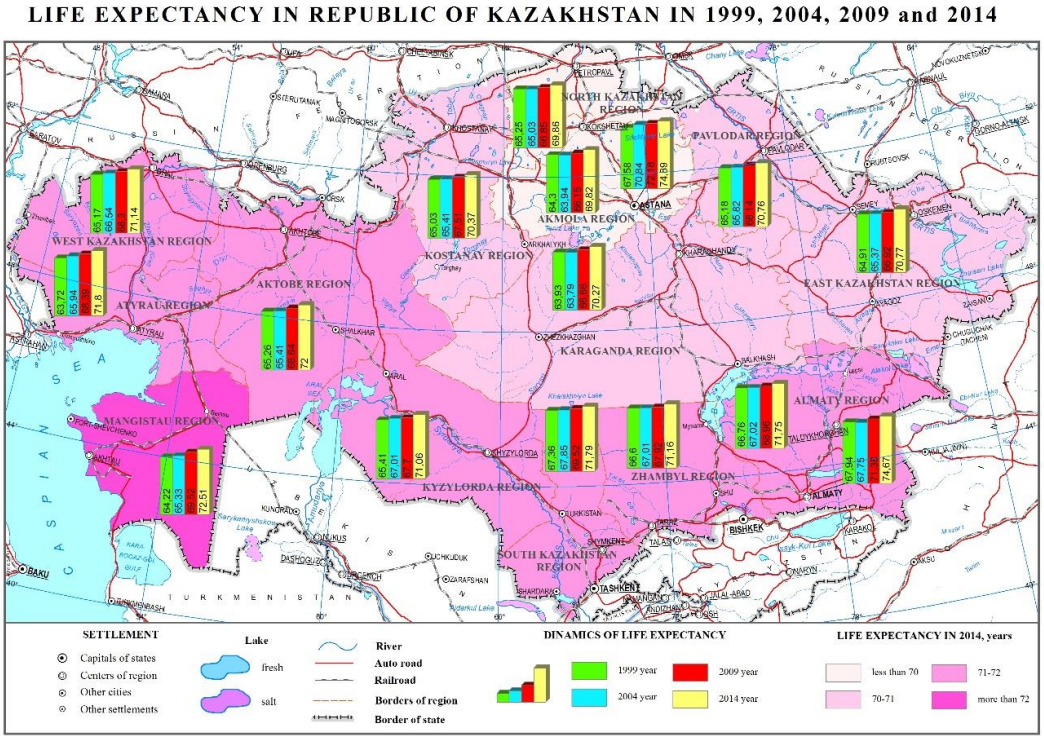
Source: Committee on Statistics of the Republic of Kazakhstan

Figure 5. Life expectancy in the Republic of Kazakhstan in 1999-2014 years

At the same time, life expectancy of the population is increasing in Kazakhstan in dynamics. According to the Committee on Statistics of the Republic of Kazakhstan, in 2014 the average life expectancy indicator in Kazakhstan was 64.8 years for men and 74.3 years for women. In 1999, life expectancy indicator for men on average was 58.5 years and for women 69.9 years. During the period of 1991-2014, in the context of gender there were not any changes in the life expectancy indicators. On average, men live 10 years less than women. The greatest gender difference in life expectancy indicator of 11.9 years was observed in the republic in 2007. The reasons for the low life expectancy of men are professions related with risk to life (miners, drivers and others). The realization of the State Program "Salamatty Kazakhstan" has made a specific contribution to the increase of life expectancy in the country, which is aimed at improving the health of Kazakhstani people, providing sustainable socio demographic development of the country, improving the quality of medical care and treatment of basic socially significant diseases (Nyussupova, Kalimurzina, 2014).

In 1999, high indicators of life expectancy were in Almaty and Astana (67.4 and 67.9 years, respectively). South Kazakhstan region with life expectancy indicator of 67.3 years was on the third place. The lowest indicator of average life expectancy was observed in Atyrau and Karaganda regions, with 63.72 and 63.93 years. In 2004, the national average life expectancy indicator was 66.18 years; the maximum indicator was -70.84 years in Astana city, which was more than the average indicator by 4.66 years and more than the minimum indicator in Karaganda region (63.79 years) by 7 years. The biggest differences in this indicator were showed in 2009, the life expectancy of the population was the same in Mangistau, South Kazakhstan regions with 69.52 years, but Almaty city and Astana city always remained the leaders. In these cities, the life expectancy indicator for 10 years grew by almost 5 years, with 72.18 and 71.38 years respectively. Low indicators were in Akmola

(66.15 years), Karaganda (66.66 years) and East Kazakhstan regions (66.92 years). In 2014, there were not significant changes in the life expectancy indicators. The same regions remained the leaders, Aktobe region joined them. The average life expectancy indicator in these regions was 71-74 years. The low indicators were in those regions as they were in 2009 (Figure 6).



Source: Developed by the authors based on data from Committee of statistics of Republic of Kazakhstan

Figure 6. Life expectancy in the Republic of Kazakhstan in 1999, 2004, 2009 and 2014 years

To determine the fact that the life expectancy depends on environmental factors, namely on the amount of harmful pollutant emissions into the atmosphere, the correlation of these parameters per capita was made in Kazakhstan (Figure 7).

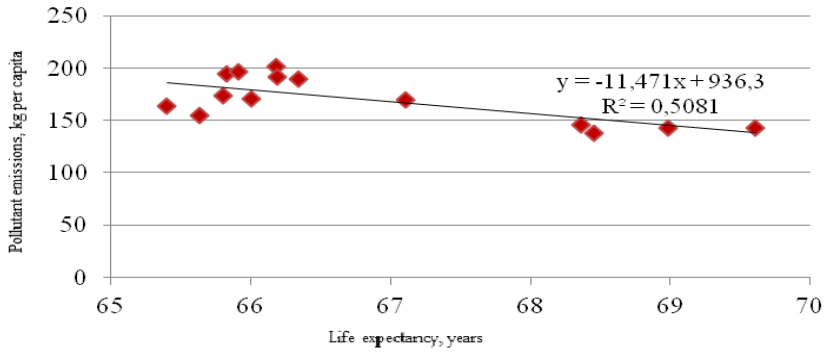


Figure 7. Correlation between life expectancy and the volume of substances emissions into the atmosphere in the Republic of Kazakhstan

The analysis shows that the amount of harmful emissions into the atmosphere inversely correlated to life expectancy. The correlation coefficient r = - 0.7 shows that the life expectancy indicator in the country is increasing with the decrease of the amount of harmful emissions into the atmosphere.

Life expectancy of the population of Kazakhstan is strictly correlated with income of the population (Figure 8). Life expectancy in the country is increasing with the increase of their incomes.

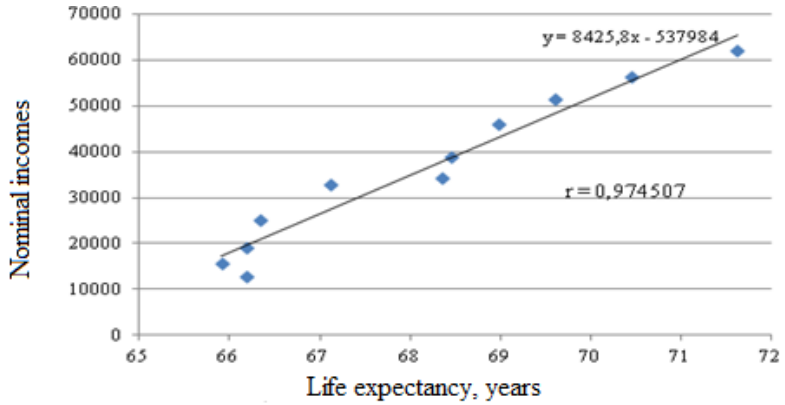


Figure 8. The correlation between life expectancy and the nominal income of population in the Republic of Kazakhstan

In general, the increase in life expectancy in Kazakhstan is the result of economic development and the development of medicine, improvement of the hygienic culture of the population and educational standards. The increase in life expectancy is a necessary condition for the increase in labor productivity and efficiency, economic progress and education in the country.

Demographic processes play an important role in the assessment of the level and quality of life of the population. Taking into account the importance of demographic factor, as the factor of sustainable economic growth, the development of socio-demographic policy is actively conducted in Kazakhstan, it aims at solving a set of problems and taking into account all potential external and internal trends of demographic processes. In connection with the increase in birth rate and aging of the population in Kazakhstan, it is observed demographic pressure of pre-working and post-working age population. The different distribution of populations in the three age intervals not only indicate a variation in the ageing path among countries, it also provides important information on what key policy issues may be in future (Lucis et al., 2012)

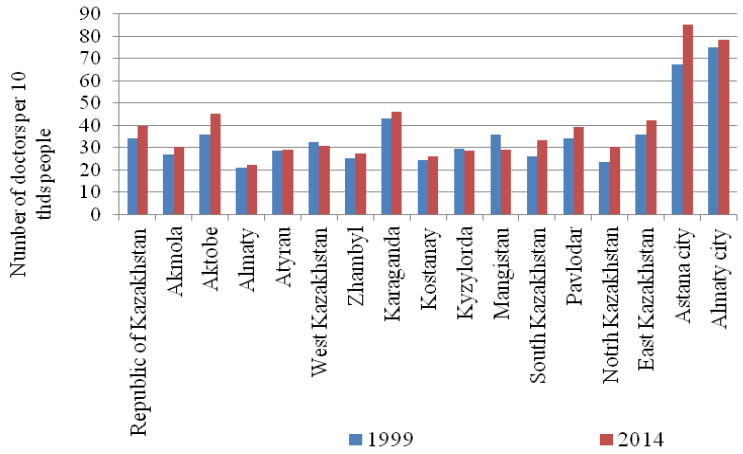
The development of appropriate mechanisms and targeted measures were taken by the government will promote the favorable development of the socio-demographic factors in Kazakhstan. Pursuing the targeted, balanced, comprehensive demographic policy will contribute to long-term economic growth in the Republic of Kazakhstan.

The health care indicators are important in the assessment of the quality of life, they are important in the determination of life expectancy, not only in Kazakhstan but in the world as well.

In 1991, the number of doctors of all specialties in the Republic of Kazakhstan was 67.6 thousand people, and in 2014, it was 68.8 thousand people. It was for the first time when the number of doctors was more than it was in 1991. Since the collapse of the Soviet Union in 1991, there was a significant decrease in the number of doctors due to a number of factors, such as leaving the system by medical professionals, the emigration of Russian-speaking people and other ethnic groups, the reduction of medical staff. By 2000, this figure reached its critical level, and the number of doctors was 20% less compared to the year of the collapse of the USSR. For 1999-2014, the number of doctors increased by 27%. At the same time, in 1991 the smallest number of doctors was in Mangistau region – 1.5 thousand people, the greatest number was in Almaty and it was - 10.1 thousand people. In 2014, this minimum indicator - 1.6 thousand people was observed in Atyrau region, the maximum indicator of

12.1 thousand people was in Almaty. The percentage of doctors working in the private sector was growing. In 1999, 10% of all doctors worked in private sector, by 2010, the share of doctors working in private sector rose up to 16%.

In 2009, the availability of doctors in urban areas was 58.3 doctors per 10 thousand people, while in rural areas there were 14.1 doctors per 10 thousand people, which is almost 4 times less than in urban areas. In 2009, the largest number of doctors in rural areas was registered in Karaganda region (20.1 doctors per 10 thousand people.), and the lowest availability was in North Kazakhstan region (9.6 doctors per 10 thousand people). By the number of doctors per 10 thousand people in Kazakhstan in 2014, Almaty and Astana cities, Karaganda region were the leaders. In these regions, there were 46 to 85 specialists per 10 thousand people. While in the whole country, this indicator was low - 40 doctors per 10 thousand people; the least number of specialists was in Zhambyl, Kostanay, Almaty. In 1991, the average availability of doctors per 10 thousand people in the country was 39.6, in 2014 - 39.5 (Figure 9).



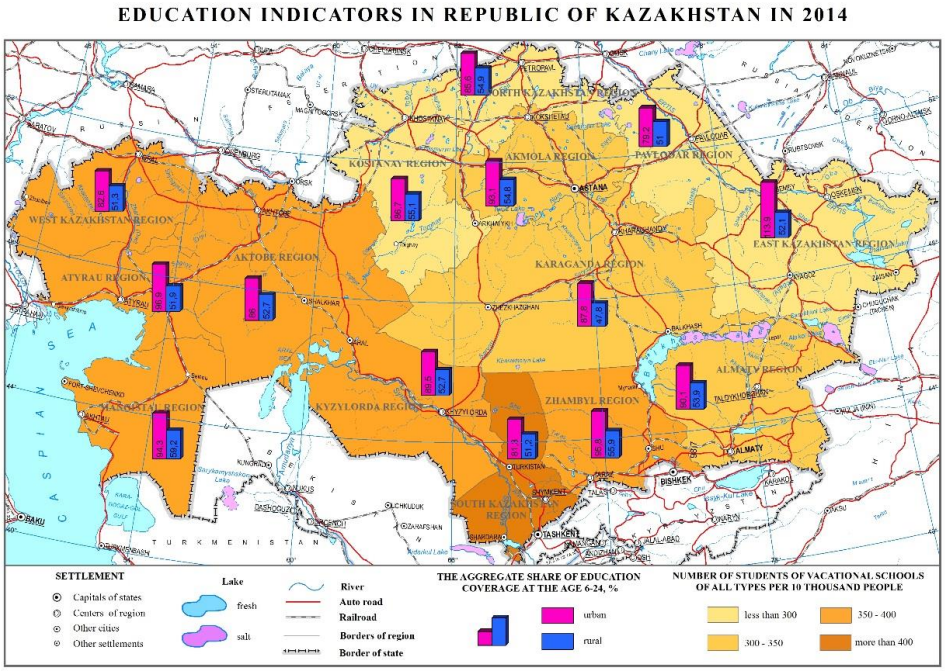
Source: Committee on Statistics of the Republic of Kazakhstan

Figure 9. Average availability of doctors per 10 thousand people in the regions of the Republic of Kazakhstan in 1999 and 2014 years

In Kazakhstan the principle of universal access to education has been realized at sufficiently high level. The priority of Kazakhstan's education is to ensure its competitiveness in the global context.

In 2014, in Kazakhstan, 72.9% of the population at the age of 6-24 years was covered by education, compared with 1995 this indicator increased by 9%. At the same time, in urban areas coverage by education was 1.6 times higher than in rural areas, and was 90.4% and 54.7%, respectively (Figure 10).

The combined share of education coverage of the population in the country at the age of 6-24 years had a tendency to decrease from 78.7% in 2004 to 72.9% in 2014. At regions, in 1999 education coverage of 68.9% was observed in Aktobe, Mangistau, West Kazakhstan, Karaganda and Atyrau regions. The lowest combined share of education coverage of the population aged 6-24 years was observed in Astana city, Almaty and Zhambyl regions. The maximum indicator was in Almaty-90.4%.



Source: Developed by the authors based on data from Committee of statistics of Republic of Kazakhstan

Figure 10. Gross coverage of the population at the age of 6-24 years by education in 2014

In urban areas the maximum indicator was observed in Aktobe region – 90.3%, the lowest indicator was in Astana (58.5%). In rural areas in 1999, the highest indicators were in Atyrau region - 63.4%, the lowest indicator was in the Aktobe region -55.9%. In 2004, the average republican indicator was - 78.7%. The maximum indicator of 122.5% was in Almaty. It should be noted that Almaty with the education coverage indicator of 127.3% was the leader in 2009. This high indicator is mainly because of migration flows of young people from all over the country to get an education. In 2009, only 5 regions' indicators were higher than the average republican indicator. The lowest indicator of education coverage of the population aged 6-24 years was in the North-Kazakhstan and Almaty regions. According to the method of calculation of the indicator of education coverage, it can be influenced by the following factors:

- "demographic" - increase (decrease) of population in the age group of 6 to 24 years;
- development of "lifelong learning" in the age groups of 24 years and older.

Table 3 shows the number of students of vocational schools of all types in Kazakhstan per 10 thousand people. If in 2014 the average national number was 365.7 per 10 thousand people, in 2004 it was 460.2 per 10 thousand people. The maximum indicator of 433.3 at the regional level was in Almaty. The minimum indicator of 263.4 per 10 thousand people was in North-Kazakhstan region. In 2004, the leader was Almaty with the indicator of 606.2 per 10 thousand people; the outsider was Astana with the indicator of 375.3 per 10 thousand people. The decrease in the number of students in all kinds of schools was because of the increase in population in 2014 compared to 2004. According to the census of 2009, the republican number was 390.4 per 10 thousand people. The decrease was 16% compared to 2004, and in 2014 the decrease was 6% compared to 2009. The percentage difference between 2004 and 2014 was 21%.

Table 3. Number of students in vocational educational institutions per 10 000 population in the regions of the Republic of Kazakhstan in 2004, 2009 and 2014 years

Regions	The number of students of vocational schools of all types per 10 thousand people		
	Years		
	2004	2009	2014
Republic of Kazakhstan	460,2	390,4	365,7
Akmola	412,2	348,8	334,4
Aktobe	512,4	398,2	371,1
Almaty	391,5	311,0	323,7
Atyrau	534,3	428,2	394,5
West Kazakhstan	465,6	408,0	380,9
Zhambyl	459,4	406,4	384,8
Karaganda	437,0	368,5	338,7
Kostanay	389,1	323,0	290,3
Kyzylorda	506,9	416,9	383,8
Mangistau	568,3	419,3	391,8
South Kazakhstan	527,3	451,0	441,9
Pavlodar	393,0	336,7	300,0
North Kazakhstan	405,6	315,4	263,4
East Kazakhstan	397,6	339,3	291,0
Astana city	375,3	377,7	391,4
Almaty city	606,2	530,8	433,3

Source: Committee on Statistics of the Republic of Kazakhstan

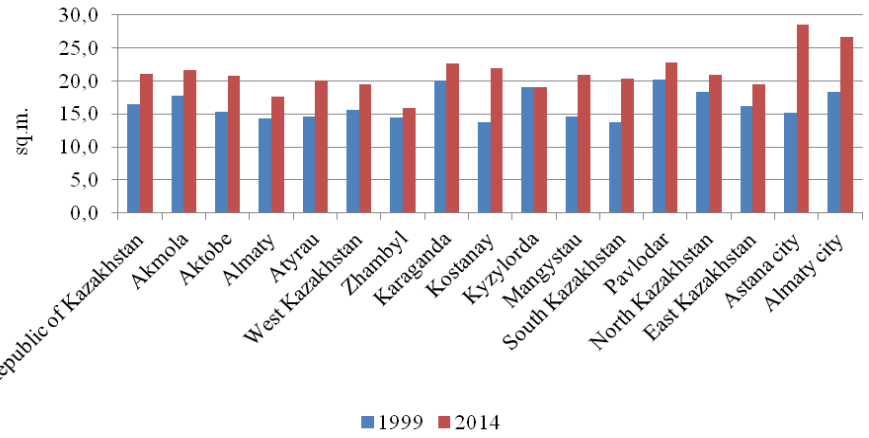
In the Republic of Kazakhstan, according to the results of the 2009 census a little more than 32 thousand people (0.3%) aged 15 and older was illiterate. In 2016, 99.79% of the population were literate. About 29.2 thousand people still remain illiterate. The literacy rate among the male adult population is 99.81% i.e. 12.7 thousand people in Kazakhstan are illiterate. The literacy rate among the female adult population is 99.78% i.e. 16.4 thousand people are illiterate. The literacy rate among the young people is 99.81% and 99.87% for male and female, respectively. The overall literacy rate among young people is 99.84%.

The state of the housing in the country clearly reflects the socio-economic development, the social climate in the society and the standard of living of the population. Housing in Kazakhstan, a country with difficult climatic conditions, is the basis of life for the majority of the population. For the period of 2004-2014, the republic housing increased by 84.2 million sq. meters (25%). The increase of the housing is predominantly due to the increase of urban housing. In the regional context, the largest share of housing was in South Kazakhstan region (14.3%), Almaty city (12.2%) and Almaty region (8.7%). In 2014, housing security in the republic was 21 m2 per 1 person. Since 2010, housing security in rural areas increased from 16.5 m2 to 17.6 m2 per a person, and in urban areas - from 20.2m2 to 23.8 m2, respectively. The average annual growth of housing security for the period of 2004-2014 was 17.7%; while maintaining the rates, Kazakhstan can reach the number of 24-25 m2 per a person by 2020. In 2014, housing security of urban population was by 6 m2 more than in rural areas. The housing improvement indicators tend to rise. During the period of 2004-2014, the fresh water supply of the population increased by 45%, sewer system by 30%, bath and shower and central heating by 5%, gas and hot water supply by 2%.

In the regions of Kazakhstan from 1999 to 2014, the indicator of the housing of the population had a positive trend. In 1999, the highest indicators of housing were in Karaganda and Pavlodar regions - 20 m2 per a person, the lowest indicators were in Kyzylorda and South Kazakhstan regions - 13.8 m2 per a person. In 2014, the highest housing indicator was in Almaty city (27.6 m2 per a person) and Astana city (28.3 m2 per a person). The lowest

housing indicator was in Zhambyl (15.6 m2 per a person) and Almaty region (17.1 m2 per a person).

During this period, in the republic as a whole, the housing increased from 16.4 square meters per a person in 1999 to 20.9 square meters per a person in 2014. There was the increase of housing in all regions of the country. The highest housing indicators in 1999 were in Karaganda and Pavlodar regions, in 2009 - in the Karaganda region and Astana city, and in 2014 - in Almaty city and Astana city (Figure 11).



Source: Committee on Statistics of the Republic of Kazakhstan

Figure 11. Average housing supply of population in the Republic of Kazakhstan in 1999 and 2014 years

The solution of housing problem depends on the financial state of citizens and their solvency, which is determined by the relation between income and cost of housing. In Kazakhstan, the cost of housing increases on average by 8.3% every year. Due to public housing programs, there are so-called "bottom" prices in the housing market, which is, in fact, the minimum price. In Kazakhstan, this figure, on average, is 170 000 tenges per m2 in economy class buildings (according to the program of regions development, the cost of m2 of housing is from 90 000 tenges to 142 tenges). By the end of December 2015, according to statistics, the cheapest housing in the new housing market was in the cities of Zhezkazgan and Tadlykorgan (90 000 tenges per 1 m2), and the most expensive was in Shymkent (364 402 tenges per m2), Atyrau (353,468 tenges per m2) and Astana (335 476 tenges per m2). On the second hand housing market, the most affordable housing was in Kyzylorda city (115 660 tenges per m2) and Zhezkazgan city (117 384 tenges per m2), and the most expensive square meter was in the cities of Almaty (350 642 tenges), Aktau (342 080 tenges per m2) and Astana (341 389 tenges per m2). In this regard, the mechanisms of property investment based on borrowing funds, which include mortgage loans, housing savings system through JSC "Housing Construction Savings Bank of Kazakhstan", JSC "Kazakhstan Mortgage Company" are particularly important (Shinkeeva, 2016).

The indicator of health care through the availability of doctors and the state of the housing clearly reflect the socio-economic development of the country and the standard of living of the population. The increase of many social indicators is reflected in social programs of the Republic of Kazakhstan. In Kazakhstan, the principle of universal access to education has been realized at the sufficiently high level, there is a fairly high level of adult literacy in the country with the high percentage of education coverage in many regions of the republic.

4. CONCLUSION

The assessment of the socio-geographical indicators in the Republic of Kazakhstan has revealed a great contrast of these indicators in the regions. Thus, it showed a negative demographic situation in the northern regions of the country. Low birth rates, life expectancy, a significant outflow of population and high mortality rate are observed in Kostanay, North Kazakhstan and East Kazakhstan regions. The birth and death rates in the Kostanay region are 14.5 % and 10.6 %, respectively, in the North-Kazakhstan region – 14.3% and 11.9 %, in the East Kazakhstan region – 17.0 % and 10.3 %. The national average birth rate in 2014 was equal to 23,1 %, while the mortality rate – 7.5 %. Thus, in the abovementioned regions the birth rate compared with the national average rate is 1.3-1.6 times lower, the mortality rate is 1.4-1.6 times higher. The rate of natural growth in these areas is at the level of 4-7%, which is 2-4 times less than the national average indicator. In these regions, it is necessary to increase the birth rate up to 23 % and to decrease the mortality rates to the level of the national average indicator – 7.5%. The life expectancy of the population in Kostanay, North Kazakhstan, Karaganda, Akmola, East Kazakhstan and Pavlodar regions is 70 years, which is less than the national average indicator by 1.5 years. In these regions, it is necessary to increase life expectancy up to the national average indicator, and in future to increase the life expectancy of the population of the republic up to 73 years by 2025, which is consistent with the adopted national program "Densaulyk" for 2016-2020. Alongside with this, it is necessary to reduce gender differences in mortality up to 5 years, which was equal to 8.8 years in 2014. Life expectancy for men is 67.1 years, for women is 75.9 years.

The high birth rates, natural growth and infant mortality rates are characteristic of South Kazakhstan, Mangistau, Kyzylorda, Zhambyl, Pavlodar, Akmola regions, Almaty and Astana cities. In future, it is necessary to reduce the maternal mortality up to 8 cases per 100 thousand of live births per year, which is important for Almaty city, Astana, Mangistau, Zhambyl, Akmola, South Kazakhstan, Pavlodar regions.

In order to integrate the republic into the global community and become one of the most competitive and developed countries, it is necessary to reduce infant mortality, at least up to 6.9 %. These recommendations are relevant to all regions of Kazakhstan.

The low availability of doctors per 10 thousand people in 2014 was characteristic of Almaty (22 per 10 thousand people), Kostanay (26.1 per 10 thousand people), Kyzylorda (28.6 per 10 thousand people) regions. In a number of regions (Akmola, Atyrau, West Kazakhstan, Mangistau, North Kazakhstan), the indicators of doctors' availability are about 30 doctors per 10 thousand people. For these areas, it is necessary to increase the number of doctors up to the national average figure - 39.5 doctors per 10 thousand people, although this figure is considered to be low. In the developed countries of Europe, this indicator is 45 doctors per 10 thousand people.

In the Republic of Kazakhstan, the principle of universal access to education has been realized at sufficiently high-level. A high level of literacy of the adult population with the highest percentage of education coverage (98.7%) is observed in Almaty and (85.4%) in Astana, while a low percentage of education coverage of the population in North Kazakhstan region is 66.3% and Almaty region is 61.8%.

The state of the republic housing stock clearly reflects the socio-economic development, the social climate in the society and the standard of living of the population. The highest rates of availability of housing in 2014 were in the cities of Almaty and Astana, the lowest levels were in Zhambyl and Almaty regions.

An important key point in improving the quality of life in Kazakhstan is to solve the housing shortage. The priority directions of development of the housing sector should be: modernization of housing infrastructure, the development of mortgage lending for

construction and purchase of housing, the creation of favorable conditions for attracting investments in the housing sector, development and realization of regional programs to provide housing for socially disadvantaged groups. These recommendations are relevant to all regions of Kazakhstan, but at the same time in Zhambyl, Almaty, Kostanay regions, Almaty city and Astana there is an acute housing shortage. In the three above-mentioned regions the housing supply per a person on average was 20 m2, in the cities of Almaty and Astana was 27 m2 per a person in 2014. It is necessary to increase the housing supply of the population in Zhambyl, Almaty, Kostanay regions up to 30 m2, in Almaty and Astana up to 35-40 m2 per a person.

As a result of a spatial analysis of the socio-geographic indicators of Kazakhstan for 1999-2014 years, it was found out that problems such as housing shortage, kindergartens shortage, increased crime rates, low life expectancy compared with the developed countries, and vice versa, a high infant mortality rate are still actual for the majority of its regions. The financial and economic crisis that began in 2007 directly affected the quality of life of the population that caused inflation, mass dismissals of workers, general destabilization. However, there is a positive dynamics of the socio-geographical indicators, since 1999 the rates of natural increase, life expectancy, the number of schools and others have increased.

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