The Level of Development of the Socio-Economic Indicators of the Abay Region: Methods and Analysis

Anna A. Kredina[1*] | **Leila K. Mardenova[1]** | **Alexander A. Tsoy[1]** |

[1] K.Sagadiyev University of International Business, Almaty, Kazakhstan

Corresponding author:
* Anna A. Kredina – PhD candidate, K.Sagadiyev University of International Business, Almaty, Kazakhstan. Email: anna.kredina@uib.kz

Conflict of interest: author(s) declare that there is no conflict of interest.

EJEBS

Abstract

This descriptive work is aimed at studying at the micro level the socio-demographic indicators of the Abay region of Kazakhstan. The literature review highlights the importance of population dynamics, education, health care and internal migration for sustainable development in the region and in the country. The study also uses the fuzzy set method for several aspects of the selected indicators. Secondary data for 2010-2020 are taken from an open source - the Bureau of National Statistics and were used to identify negative trends and contradictions. The results showed that over the past 10 years there are negative trends in the region in terms of indicators: a high level of emigration, a shortage of able-bodied population, an increase in the number of schoolchildren with a constant number of schools, and a negative trend in hospital organizations. Beskaragai and Borodulikha districts natural population growth decreased by 62 percent. The number of schools in the region has slightly decreased, while in Semey (23%), Kurchatov district (30%) and Ayagoz (1.54%) district there is an increase in school enrollment. In Abay and Kokpekty districts, there is a decrease in the number of schools enrollment (-10% and -16%). The number of hospital beds has decreased significantly in most districts (more than 30 percent in half of the districts). In general, this article contributes to a deeper understanding of the socio-demographic dynamics of the Abai region. The results obtained can be used in making political decisions related to population regulation and economic development in each region.

Keywords: Economic Development, Region, Regional Development, Population, Education, Health, Migration

79

1. INTRODUCTION

This research paper examines the socio-demographic indicators of the Abay region in Kazakhstan, focusing on the factors contributing to negative trends in these indicators. The study aims to provide a more nuanced understanding of the situation at the regional level, which needs to be adequately reflected in macro-level research. The research question is "What are the possible reasons for the socio-demographic indicators showing negative trends in the Abay region of Kazakhstan?" The paper utilizes secondary data from the National Statistical Committee of the Republic of Kazakhstan between 2010-2020 to describe the socio-demographic situation of the region.

The standard theory explaining this choice of indicators starts from the fundamental idea of human capital recently more developed and revised in terms of new emerging trends and economy by Deming (2022), Zhang et al. (2023), Tandrayen-Ragoobur & Narsoo (2022). In the context of Kazakhstan within the regional development Kazakhstani researchers, such as Temirova and Abdimomynova (2016) and Kireyeva et al. (2022), have exhibited significant interest in exploring theoretical approaches and methodologies for researching the regional economy of Kazakhstan. Numerous indices, including socioeconomic, ecological, infrastructural, cultural, and demographic ones, are covered by this investigation. Further, the research highlights depressed areas and their impact on social metrics as well as the reverse Kibayeva et al. (2022), Baydybekova and Sauranbay (2022). These publications mostly looked at the relationship between the macro-level socio-demographic variables of the region and population, healthcare, and education. Therefore, in order to analyse the results and explain the situation in the Abay region of Kazakhstan, this study analyzes socio-demographic parameters.

The literature review highlights the importance of education as a critical factor for sustainable development in Kazakhstan, but there are challenges related to access, quality, and relevance. Several researchers have analyzed the socio-economic development of regions in Kazakhstan, including the Abay region when it was known as the East Kazakhstan Region. Salzhanova and Gelashvili (2017) analysed socio-economic indicators such as GDP, population, and employment rates, revealing that the Abay Region has experienced positive economic growth. However, poverty and unemployment remain ongoing challenges in the region. This study highlights significant issues in migration rates, population growth, and the difficulties associated with raising children in the region. While migration can have benefits, policymakers must carefully consider potential negative impacts and implement policies that mitigate these effects while leveraging positive outcomes (Sermagambet et al., 2022; Sagadiev, 2004).

Despite the increasing recognition of the significance of human capital in achieving sustainable development, there remains limited literature on measuring human capital in Kazakhstan, particularly among school-age populations. Existing measures of human capital tend to focus solely on the educational dimension and neglect other dimensions contributing to human capital formation. Additionally, such measures tend to be presented at the macro level, making it challenging to analyze and understand the situation at the micro level. Given these limitations, this study employs the fuzzy set approach to measure the human capital of Kazakhstan's school-age population (aged 7-18 years old) while considering multiple dimensions of human capital investment. This approach aims to provide a more comprehensive and nuanced understanding of Kazakhstan's human capital and identify key determinants of its formation.

The study's practical significance is to identify the weaknesses and threats of the socio-economic indicators of the Abay region and recommend ways to improve the situation. The article follows a typical academic research format, including an introduction, methods, results and discussion, conclusion, and references.

2. LITERATURE REVIEW

This work is based on essential and relevant theories related to the relationship between the region's sustainable economic development and which are interconnected with the development of the country as a whole. There is a clear relationship between human capital wealth and economic prosperity. There are various theories in the literature on this issue. The following passages describe this from various points of view. The degree of development of the economy in the country can be determined using various methods. Scientists study indicators of human capital development to identify weaknesses and risks. "Depressed" regions of the country have lower rates compared to the average. The risks and problems existing in the regions may be subject to the snowball effect and increase in a larger volume, which will lead to an outflow of specialists in all areas of economic activity, a decrease in the birth rate, and poor quality of medical and educational services (Mansurova, 2015; Myers & Hansen, 2020).

Education plays a crucial role for children and their parents in the region where they live. According to the Constitution of the Republic of Kazakhstan, education at school (primary and secondary) is compulsory, and tuition fee is free, except for private schools. The problem in this context is related to the closure of schools in rural areas and cities. Lee and Lubienski (2017) researched the schools' closure and its impact on the criminal and socio-demographic rates. They further discussed societal inequality, especially for the students from lower-income families. Also, the closure of the schools is affecting female students more than male students, which might increase inequality in rural areas, especially economic inequality from a gender perspective. Mostly, support for female students in rural areas can be observed in developing countries where the vulnerable children are studying in private schools and give the results for teaching and training the next generation of students, therefore the local society itself.

Most research links the notion of human capital and education by highlighting social inequalities caused by a lack of access to education (Card et al., 2022). In the current environment, access to education may be seen through the inadequate number of students in a classroom, the lack of substitute teachers for many classes (subjects) within a school, and the overcrowding of the classes as a result of the distance between the students' homes and the school (Burde et al., 2017). While everyone in Kazakhstan has the legal right to attend school, the problem of having too many students in each district or school may prevent everyone from receiving the high-quality education they deserve. As a result, the students will not be interested in purchasing. Therefore the schoolchildren will not be interested in getting knowledge in higher educational institutions because they would have difficulties winning a scholarship to study due to the hardness of studying in uncomfortable conditions, or they will not be interested in getting a degree because of financial purposes or future thought about job diversification to work in that region (Piscitello et al., 2021). So the poverty of adults will lead to poverty of children, which would discourage theregion's development in socio-demographic perspectives.

The population has a significant impact on both the local economy and the overall economy of the country. Factors including population number, age distribution, and gender may statistically determine the functioning intelligence of the area. How many people are migrating will show how appealing an area is to live and work. However, encouraging families to have three or more children with financial and material support (once or briefly) cannot increase migration levels and population growth positively. This is because doing so has unfavorable consequences for the children, including poverty, filicide, and other issues if the family was unable to support them from the start (Stasiūnienė et al., 2015). The pro-natalist policy (Cook et al., 2022) was therefore ineffective or had very limited effects on the purpose. However, it was related to children's poverty, further damaging the region's and country's human capital.

Unfavorable living circumstances in the area or workplace are the following issue with population migration (Simonyan, 2017). Workers from Kazakhstan's mining sectors travel to the

81

country's eastern region to work for a set period of time before returning to the city or neighborhood where they were born and raised. Therefore, due to the lack of economic diversification and the unattractive pay of the remaining occupations, the population of East Kazakhstan will look for employment opportunities in other districts. However, industrial production is increasing. Because the original theory was based on the economics of African countries and does not apply to Eurasian countries due to differences in economic structure, social structure, and demographics, this can be explained by the theory of revisiting spatial mismatch (Lyons & Ewing, 2021).

The idea is considered under the connection between poverty and migration due to work requirements, which is applicable to Eastern Kazakhstan in the mining industry, where people have to come and work from other regions or live in a city with ecological problems related to air pollution by mining companies. As for people who live in the city, it might cause several diseases because of ecological problems that show up over a longer period. Also, the problem of poverty or less development of social satisfaction might be related to showing on a macro level the productive numbers per industry services and products. In contrast, the satisfaction level of the civilians will be low, which can lead to riots as it was in 2022, starting from Western regions and spreading to all regions of Kazakhstan (Kudaibergenova & Laruelle, 2022).

Healthier people have higher productivity, cognitive function, and working longevity, which contributes to higher economic growth rates. According to (Anghelache et al., 2022) research, advances in public health have a major positive impact on economic growth. The quantity of waste generated by hospital bed occupancy during treatment is the focus of this study, as is the number of hospitals by region or city. However, the placement of these indicators is intimately related to the population's social and economic conditions, particularly its financial standing. According to Spankulova et al. (2020), many socioeconomic determinants and health inequalities are interconnected in Kazakhstan, resulting in considerable discrepancies in population health status. Living conditions and income levels are linked to poor health.

According to the OECD report titled "Health Systems Reviews: Kazakhstan 2018" (2018), the effectiveness of healthcare in Kazakhstan has been analyzed to be high. However, the methodologies used to determine effectiveness may not be suitable for Kazakhstan, as patients in Kazakhstan tend to be hospitalized with a wider range of sickness levels compared to other countries analyzed by the OECD, where patients with more serious illnesses, such as cancer, are more likely to be hospitalized. As a result, the death rate of patients in hospitals may be higher in these countries than in Kazakhstan, where only 0.92 deaths per 10,000 hospitalized patients occur.

As a conclusion of the literature review, we should note that socio-demographic and economic indicators might show the results only when it is considered from several perspectives because some regions will show high productivity but low level of citizens satisfaction, for example, Yemen (export is high, but the malnutrition problems in society) (Milenković et al., 2014). As a result, it is preferable to consider signs as a whole. Regional development research is vital for developing or suggesting strategies for sustainable development, including urban and rural development (Pou et al., 2021; Bacorn et al., 2022). Researchers also looked into how socio-demographic characteristics affected quality-of-life outcomes in adults with difficult-to-treat conditions like cancer and diabetes (Vigl et al., 2011; Lyratzopoulos et al., 2013; Khan et al., 2017).

3. METHODOLOGY AND DATA

The study makes use of a descriptive research methodology, which enables the collection of research data quantitatively on particular variables for statistical analysis. This paper collected data from 2010 to 2020 from official statistical yearbooks for districts and cities of the Abay

region (Bureau of National Statistics of the Republic of Kazakhstan). The data covered in the study include sociological indicators such as the number of schools and students, hospitals and demographic indicators such as the migration rate, population and birth rate. The growth rate between 2010 and 2020 was then analyzed to determine the percentage increase between values to identify trends. Negative trends were seen in the data, which include the trend in the number of schools, the number of pupils, the number of hospital beds and hospital organizations, the trend in the migration balance, the rate of natural increase and the birth rate and the trend in the population size.

Secondary data (data sampling)

The method of this study is based on descriptive economic analysis of secondary data to describe economic phenomena in the Abay region. In order to point out that this particular region has negative values, which is of concern and becomes relevant to the study. East Kazakhstan region was divided in 2022 into Abay and Ulytau regions, accordingly inheriting the cities and districts. Recently appeared Abay region consists of the following cities and districts: Semey city, Kurchatov city, Abay, Ayagoz, Beskaragai, Borodulikha, Zharma, Kokpekty and Urjar districts. Therefore, to analyse the situation in the Abay region, it is important to collect the data from the cities and districts separately and make an analysis for the whole region.

This study used existing data from 2010 to 2020 from the Bureau of National Statistics of the Republic of Kazakhstan to analyze the economic well-being of the Abay region. This study used the social and demographic indicators' dynamics to assess the regional well-being of the region (Capello, 2007; Fang et al., 2019). The method is described as a series of steps shown below in Figure 1.
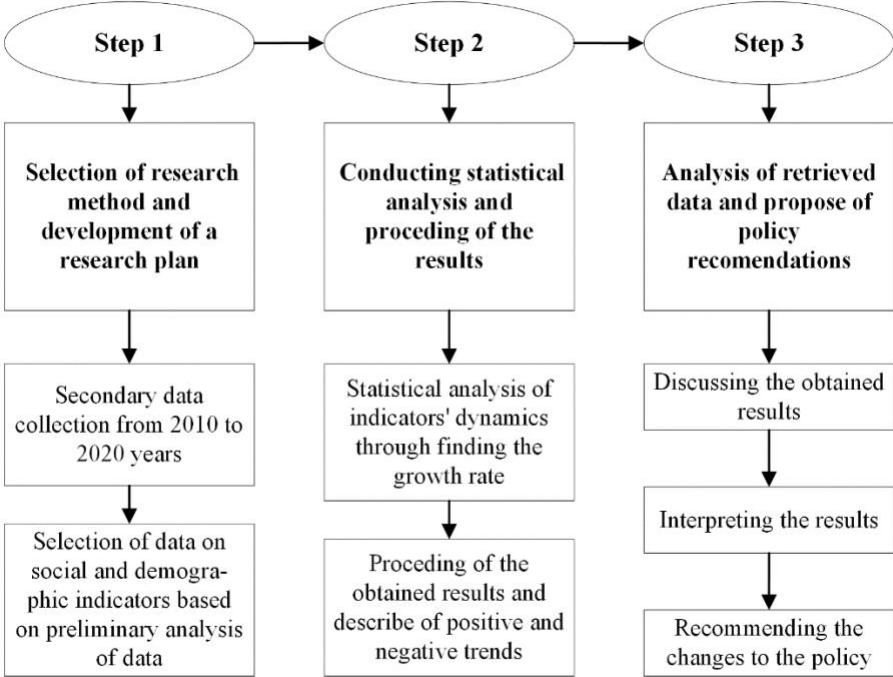

FIGURE 1. Steps of the method to conduct the research

Note: compiled by the authors

The preliminary statistical analysis (growth rate) on retrieved data assisted in estimating the indicators which were showing negative trends and were contradictory. Abay region was chosen

83

from the regions of Kazakhstan due to its appearance as a new region in 2022 in Kazakhstan. The region shows negative trends in sociological and demographic indicators. The paper does not engage with the Aksu district due to the absence of statistical data for this district. The method of examining the dynamics over 10 years was chosen for this research in order to assess the economic well-being of the newly formed Abay region, which comprises several cities and districts in Kazakhstan. The appearance of this new region in 2022 necessitated the collection and analysis of social and demographic indicators separately for each city and district. The study used existing data from 2010 to 2020 from the Bureau of National Statistics of the Republic of Kazakhstan. It analyzed the growth rates of various indicators to identify negative trends and contradictions. Table 1 provides a list of the retrieved data variables with their corresponding units of measurement.

TABLE 1. Retrieved data variables with units of measure

No.	Sphere	Variable	Unit of measurement
a	Dynamics of population	Balance of migration	count
		Population	count
b	Evolution of the number of schools and trends in school enrollment	Number of schools	count
		Number of school students	count
		School enrollment	count, in thousands
c	Evolution of the number of hospital beds and hospital organizations	Number of hospital beds	count
		Number of hospital organizations	count
d	Dynamics of regional distribution of population broken down by the balance of migration	Natural increase (decrease rate) of the population	per million
		Birth rate	per million
Note: compiled by the authors			

These variables were chosen based on their relevance to the economic well-being of the region and their potential relationship to education and human capital, as discussed in the literature.

The variables include the balance of migration, population count, number of schools, number of school students, school enrollment (counted in thousands), number of hospital beds, number of hospital organizations, natural increase (decrease rate) of the population, and birth rate. The unit of measurement for the balance of migration and population count is 'count', which refers to the number of people. The unit of measurement for school-related variables such as the number of schools, number of school students, and school enrollment is also 'count'. The number of hospital beds and hospital organizations is also counted in 'count'. The natural increase (decrease rate) of the population and birth rate is measured per million (ppm), which refers to a fraction of one thousand, usually used to indicate rates per thousand of the population. The data of the migration balance is shown in absolute units (number of people) and the growth rate was calculated as follows:

$$\text{Growth rate} = \left(\left(\frac{\text{Balance of migration 2020}}{\text{Balance of migration 2010}} \right) - 1 \right) * 100\% \qquad (1)$$

84

Regarding migration balance for the Abay region, this indicator demonstrates difference of absolute number of people immigrating and emigrating (immigration minus emigration) to the particular city or district. In case of an increasing number of emigrating amount of people, the result will be shown in negative numbers.

3. ANALYSIS AND RESULTS

Dynamics of population

The problem of decreasing the population in the Abay region is discussed in the following section. The population of the Abay region is demonstrating decreasing trend through the demographic indicators a balance of migration and population as it is shown in Table 2.

TABLE 2. Dynamics of population, in people units

Region	Balance of migration in people			Population, in people		
	2010	2020	Growth rate, %	2010	2020	Growth rate, %
Semey city	-49	-2291	45,76	326 965	349 957	7,03
Kurchatov	533	2	-1,00	10 406	12 317	18,36
Abay district	-163	-212	0,30	15 314	14 147	-7,62
Ayagoz district	-1303	-1335	0,02	74 603	71 670	-3,93
Beskaragai district	-422	-354	-0,16	21 997	18 299	-16,81
Borodulikha district	-681	-459	-0,33	39 664	35 403	-10,74
Zharma district	-731	-921	0,26	44 835	37 042	-17,38
Kokpekty district	-950	-637	-0,33	34 241	27 597	-19,4
Urjar district	-1196	-1682	0,41	82 613	72 762	-11,92
Note: compiled by authors based on the data from the Bureau of National Statistics (2022)						

The research study analyzed the population dynamics in several regions over the course of a decade. The analysis showed that Semey city had a population growth rate of 7.03%, while other regions such as Beskaragai and Zharma district experienced negative growth rates of -16.81% and -17.38%, respectively. Additionally, the data revealed that Kurchatov had a positive migration balance of 533, while Semey city had a negative migration balance of -49. Furthermore, the data demonstrated changes in population sizes in different regions. For example, the population of Semey city increased from 326,965 in 2010 to 349,957 in 2020, while the population of Urjar district decreased from 82,613 in 2010 to 72,762 in 2020. The data also showed that some regions experienced significant decreases in population, such as Kokpekty district, which saw a decrease of -19.4%. These findings provide valuable insights into population dynamics and movement in different regions. The data can be used to make predictions about future population changes and inform policy decisions related to population management and development in each region. Overall, the research study contributes to a better understanding of population trends and can serve as a basis for further research in this area.

Therefore, another significant aspect of the demographic indicator that is shown in Table 1 is population. Before proceeding to examine the economic situation of the Abay region, it is important to note the situation with the population trend between 2010 and 2020 (Table 1). The overall trend for the Abay region cities and districts is negative. Only cities such as Semey (7%) and Kurchatov(18%) are showing the positive growth rate of the population. The three highest amounts of the population number decline are demonstrated in the districts as Kokpekty (-19%), Zharma (-17%) and Beskaragai (-16,8%). As discussed above, Kokpekty and Beskaragai districts showed a positive trend in migration balance, but the population of these districts are on top of negative trends.

Evolution of the number of schools and trends in school enrollment

The next table describes the results for the socio-demographic indicators as the number of schools and the number of school students' dynamics during 2010 and 2020 for the cities and districts of the Abay region (Table 3).

TABLE 3. Evolution of the number of schools and trends in school enrollment in the Abay region during 2010-2020

Region	Evolution of the number of schools in 2010 and 2020			Trends in school enrolment, in thousands		
	2010	2020	Growth rate, %	2010	2020	Growth rate, %
Semey city	89	77	-13.48	40.4	49.9	23.51
Kurchatov	3	4	33.33	1.3	1.7	30.77
Abay district	11	11	0	2.8	2.5	-10.71
Ayagoz district	50	39	-22	13	13.2	1.54
Beskaragai district	24	21	-12.5	3.3	3	-9.09
Borodulikha district	35	32	-8.57	5.1	5	-1.96
Zharma district	45	40	-11.11	7.3	7	-4.10
Kokpekty district	44	38	-13.64	4.9	4.1	-16.33
Urjar district	54	51	-5.56	13.6	12.3	-9.56
Note: compiled by authors based on the data from the Bureau of National Statistics (2022)						

Overall, there was a slight decrease in the number of schools in the region, from 325 in 2010 to 303 in 2020, with a growth rate of -6.77%. However, the trends in school enrollment were more varied. Semey city experienced a decrease in school enrollment growth rate from 40.4 thousand in 2010 to 49.9 thousand in 2020, with a growth rate of 23.51%. Kurchatov had a slight increase in the number of schools, from 3 in 2010 to 4 in 2020, with a growth rate of 33.33%, and a corresponding increase in school enrollment growth rate from 1.3 thousand in 2010 to 1.7 thousand in 2020, with a growth rate of 30.77%.

In contrast, some districts experienced a decline in both the number of schools and school enrollment growth rate. Ayagoz district had a decrease in the number of schools from 50 in 2010 to 39 in 2020, with a growth rate of -22%, but a slight increase in school enrollment growth rate from 13 thousand in 2010 to 13.2 thousand in 2020, with a growth rate of 1.54%. Similarly, Kokpekty district had a decrease in the number of schools from 44 in 2010 to 38 in 2020, with a

growth rate of -13.64%, and a corresponding decrease in school enrollment growth rate from 4.9 thousand in 2010 to 4.1 thousand in 2020, with a growth rate of -16.33%.

Evolution of the number of hospital beds and hospital organizations

Table 4 shows the evolution of the number of hospital beds and hospital organizations in the Abay region during 2010-2020.

TABLE 4. Evolution of the number of hospital beds and hospital organisations in units in Abay region during 2010-2020

Region	Number of hospital beds in units			Number of hospital organisations in units		
	2010	2020	Growth rate, %	2010	2020	Growth rate, %
Semey city	1865	1408	-24.50	17	14	-17.65
Kurchatov	55	40	-27.27	1	1	0
Abay district	50	27	-46	1	1	0
Ayagoz district	365	224	-38.63	5	2	-60
Beskaragai district	51	46	-9.80	1	1	0
Borodulikha district	155	93	-40	3	1	-66.67
Zharma district	160	69	-56.88	3	2	-33.33
Kokpekty district	135	80	-40.74	3	2	-33.33
Urjar district	265	188	-29.06	5	2	-60
Note: compiled by authors based on the data from the Bureau of National Statistics (2022)						

A negative trend is shown by the dynamics of the number of hospital beds (Table 3). The data indicate that there was a significant decrease in the number of hospital beds in most districts, ranging from -9.8% to -56.88%. The largest decline was observed in Zharma district (-56.88%), followed by Ayagoz district (-38.63%) and Borodulikha district (-40%). The only districts where the number of hospital beds increased were Kurchatov and Beskaragai, although the increases were relatively small (33.33% and 9.8%, respectively).

In terms of hospital organizations, there was a decrease in most districts, ranging from -66.67% to -17.65%. The largest decrease was observed in Ayagoz and Urjar districts, both with a decrease of 60%, followed by Borodulikha district (-66.67%) and Zharma district (-33.33%). The only districts where the number of hospital organizations remained the same were Abay and Kurchatov.

Overall, the data suggest a significant decline in the availability of hospital beds and hospital organizations in the Abay region during 2010-2020.

Dynamics of regional distribution of population broken down by the balance of migration

The balance of migration is the difference between the number of people moving into the region and the number of people moving out of the region. The natural increase (decrease) rate is the difference between the number of births and the number of deaths, expressed as a rate per thousand people. The birth rate is the number of births per thousand people.

Table 5 shows the dynamics of population distribution in different regions of Abay, Kazakhstan from 2010 to 2020, broken down by three indicators: balance of migration, natural increase (decrease) rate, and birth rate.

TABLE 5. Dynamics of regional distribution of population broken down by balance of migration, natural increase (decrease) rate, and birth rate, Abay region, 2010-2020

Region	Balance of migration in people			Natural increase (decrease) rate of the population, in ppm			Birth rate, in ppm		
	2010	2020	Growth rate, %	2010	2020	Growth rate, %	2010	2020	Growth rate, %
Semey city	-49	-2291	4575,51	6,49	7,24	11,56	16.71	17.65	5.63
Kurchatov	533	2	-99,62	0,32	7,6	2275	16.7	16.9	1.20
Abay district	-163	-212	30,06	14,66	5,89	-59,82	21.77	17.47	-19.75
Ayagoz district	-1303	-1335	2,46	15	12,86	-14,27	23.08	21.31	-7.67
Beskaragai district	-422	-354	-16,11	3,35	1,27	-62,09	16.82	16.49	-1.96
Borodulikha district	-681	-459	-32,6	2,64	0,99	-62,5	15.14	14.41	-4.82
Zharma district	-731	-921	25,99	11,03	10,93	-0,9	21.58	21.29	-1.34
Kokpekty district	-950	-637	-32,95	4,26	3,37	-20,89	16.76	15.52	-7.40
Urjar district	-1196	-1682	40,64	9,44	9,18	-2,75	19.44	18.49	-4.87
Note: Compiled by authors based on the data from the Bureau of National Statistics (2022)									

The data presented in Table 5 illustrates population dynamics in the Abay region from 2010 to 2020, broken down by balance of migration, natural increase (decrease) rate, and birth rate.

A table review reveals that Semey city and Kurchatov had positive migration balances, with Kurchatov also exhibiting a high birth rate. Conversely, Abay district experienced negative migration balances, decreasing natural increase rates, and decreasing birth rates. Ayagoz district also had a negative balance of migration. However, its natural increase rate remained relatively stable with a slight decrease, and it had consistently high birth rates over the decade.

Beskaragai, Borodulikha, and Kokpekty districts all had negative migration balances, decreasing natural increase rates, and decreasing birth rates. Similarly, the Zharma district had a negative balance of migration, but it had a relatively stable natural increase rate and a high birth rate. Finally, the Urjar district exhibited a negative balance of migration but had a high natural increase rate and a consistently high birth rate.

Taken together, the data suggest that some regions in Abay are experiencing population decline due to negative migration balances and decreasing natural increase and birth rates. However, other regions, such as Kurchatov, Ayagoz, Zharma, and Urjar, are experiencing positive population growth due to high birth rates and positive balances of migration. In Table 5, there is a negative trend in the dynamics of the natural increase coefficient for 2010-2020 in 80% of districts and cities of the Abay region. This may have serious consequences for the development of cities and districts.

5. DISCUSSIONS

Dynamics of population

Regarding the results, the emigration rate from the cities and districts is higher than immigration. The positive trends are shown in Beskaragai, Borodulikha, Kokpekty districts and Kurchatov city in comparison between 2010 and 2020 with slight differences. In contrast, the negative trends for migration balance are shown in the cities and districts of Semey, Abay, Ayagoz, Zharma and Urjar. The high number of emigrants might cause problems with a shortage of the working population in the research districts and cities. It might become the reason for the lower economic development of the Abay region. Also, this tendency might be explained by the search for available and satisfactory working opportunities in the big cities, the migration of school graduates for educational purposes and might be related to returning of the ageing people to the districts related to the cultural belief among elders of living in the neighborhood with during their adulthood (70+). However, the migration balance might not show the stagnation of the population migration due to the ageing of the population in districts of the region and dissatisfaction with emigration, and it does not show population growth or decline.

Evolution of the number of schools and trends in school enrollment

Due to the reduction of secondary educational institutions (schools) and the increase in the number of pupils, this may lead to several serious consequences. Firstly, it may lead to a reduction in the availability of education for children and young people in these districts and cities. Fewer schools can lead to longer commutes to the nearest school, which can be a problem for young people, especially those who do not have their own transport or limited travel finances. Secondly, it may lead to a reduction in the quality of education in these areas and cities. Reducing the number of students can lead to less funding for schools and fewer teachers. This may mean that teachers will have to teach more classes, which may have a negative impact on the quality of education. Third, it can have negative economic consequences for these districts and cities. Reducing the number of schools may discourage new residents, especially those planning to have children, which may lead to a reduction in the population and a worsening of the economic situation in these districts and cities.

To address this situation, policies should be implemented to ensure that access to education is not only available but also equitable and of high quality. One approach may involve increasing the number of schools in each district or implementing measures to reduce the student-teacher ratio. Additionally, providing financial support to families who may not have the resources to afford school supplies or transportation could help reduce access barriers. Such efforts would promote equal access to education and help ensure that all students have the opportunity to reach their full potential.

Evolution of the number of hospital beds and hospital organizations

The decrease in the number of hospital beds and organizations in different districts and cities of the Abay region can have several serious consequences.

Firstly, it may lead to a reduction in the availability of health care for the residents of these areas and cities. A reduction in the number of hospital beds and organizations can mean fewer patients are able to receive qualified medical care. This may mean longer appointment waiting times, longer travel times to receive care, and fewer available specialists. Secondly, it may increase the burden on the remaining hospital organizations. Reducing the number of hospital beds and organizations may mean that the remaining healthcare institutions have to accept more patients, which may overload the staff, worsening the quality of medical care and increasing the

89

waiting lists for appointments. Thirdly, it may lead to an outflow of qualified specialists from these areas and cities. A reduction in the number of hospital beds and organizations may mean that there are fewer opportunities to work in the medical field in this area. This may lead to skilled professionals having to seek employment in other districts and cities, which may further reduce the availability of health care for the residents of these districts and cities.

Dynamics of regional distribution of population broken down by the balance of migration

First, a negative coefficient of natural increase can lead to a decrease in population, which can further cause a decrease in demand for goods and services. This may result in less interest in investing in the urban economy. Secondly, a declining population could lead to lower production and employment rates, which could negatively impact the area's economic development. Therefore, measures should be taken to stimulate the birth rate and attract new inhabitants to the cities and districts of the Abay region, as well as to create favourable conditions for investment and economic development.

The population dynamics for the analyzed period indicate a steady downward trend from a negative 4% to a negative 18%, which can be attributed to the following reasons. The number of schools, hospital beds and organizations is decreasing in these towns and districts, as is the birth rate. This leads to poor infrastructure for developing young families, which may have the potential for developing villages and towns. The outflow of population from districts and villages to cities is increasing, leading to a shrinking labor force and reduced economic growth in these areas.

6. CONCLUSIONS

In conclusion, this study analyzed socio-demographic data in the Abay region and provided insights into population changes in different regions. The findings could inform policy decisions related to population management and development in each region.

(a) The study also revealed a higher emigration rate than immigration, which may cause a shortage of the working population and lower economic development in the region. However, the migration balance alone may not fully capture the population dynamics in the region. The study highlights the importance of considering socio-demographic indicators in regional development planning and contributes to a better understanding population trends.

(b) Furthermore, the analysis of changes in the education sector in Kazakhstan from 2010 to 2020 indicated a positive trend in the number of school students despite a decrease in the total number of schools. This information can assist policymakers and researchers in identifying areas for improvement and making informed decisions to enhance the education sector in Kazakhstan. Similarly, the negative trend in the number of hospital beds and hospital organizations in the Abay region during 2010-2020 could lead to reduced access to healthcare, an increased burden on remaining hospitals, and an outflow of qualified specialists from the region.

(c) In general, reducing the number of hospital beds and organizations in districts and towns of the Abay region can have serious consequences for medical care, the availability of qualified specialists and the quality of life of the residents of these places. Therefore, it is necessary to take measures to preserve and develop medical institutions in these districts and cities, as well as to attract qualified specialists to work in the medical sphere.

(d) The data on population dynamics, including migration, natural increase/decrease rates, and birth rates, could be useful for policymakers and researchers interested in understanding healthcare and demographic trends in the Abay region. Overall, this study highlights the importance of analyzing and understanding socio-demographic indicators in regional development planning to promote sustainable economic and social growth.

A limitation of this analysis pertains to the unavailability of data for the Aksuat district, which was separated from the Tarbagatai district. Consequently, separate calculations could not be performed for the statistically significant areas within the Aksuat district.

References

1. Anghelache, C., Anghel, M., Iacob, Ș. V., Panait, M., Radulescu, I. R., Brezoi, A., & Miron, A. (2022). The Effects of Health Crisis on Economic Growth, Health and Movement of Population. *Sustainability, 14*(8), 4613. https://doi.org/10.3390/su14084613

2. Bacorn, C., Serrano, M., & Lin, L. (2022). Review of sociodemographic risk factors for presentation with advanced non-melanoma skin cancer. *Orbit,* 1–6. https://doi.org/10.1080/01676830.2022.2123930

3. Baydybekova, S., & Sauranbay, S. B. (2022). The Role of Human Capital in the Economic Development of Countries. *Economics: Strategy anf Practice, 17*(2), 111–125. https://doi.org/10.51176/1997-9967-2022-2-111-125

4. Burde, D., Kapit, A., Wahl, R., Guven, O., & Skarpeteig, M. I. (2017). Education in Emergencies: A Review of Theory and Research. *Review of Educational Research*, *87*(3), 619–658. https://doi.org/10.3102/0034654316671594

5. Bureau of National Statistics (2023). [cited March 30, 2023]. Available: http://www.stat.gov.kz (in Russ.)

6. Card, D., Domnisoru, C., & Taylor, L. J. (2022). The Intergenerational Transmission of Human Capital: Evidence from the Golden Age of Upward Mobility. *Journal of Labor Economics, 40*(S1), S39–S95. https://doi.org/10.1086/718417

7. Capello, R. (2007). A forecasting territorial model of regional growth: the MASST model. *Annals of Regional Science*, *41*(4), 753–787. https://doi.org/10.1007/s00168-007-0146-2

8. Cook, L. J., Iarskaia-Smirnova, E. R., & Kozlov, V. A. (2022). Trying to Reverse Demographic Decline: Pro-Natalist and Family Policies in Russia, Poland and Hungary. *Social Policy and Society*, 1–21. https://doi.org/10.1017/s1474746422000628

9. Deming, D. J. (2022). Four Facts about Human Capital. *Journal of Economic Perspectives, 36*(3), 75–102. https://doi.org/10.1257/jep.36.3.75

10. Fang, C., Cui, X., Li, G., Bao, C., Wang, Q., Ma, H., Sun, S., Liu, H., Luo, K., & Ren, Y. (2019). Modeling regional sustainable development scenarios using the Urbanization and Eco-environment Coupler: Case study of Beijing-Tianjin-Hebei urban agglomeration, China. *Science of the Total Environment,* 689, 820–830. https://doi.org/10.1016/j.scitotenv.2019.06.430

11. Health Systems Reviews: Kazakhstan 2018 (2018). *In OECD eBooks*. https://doi.org/10.1787/9789264292895-ru (in Russ.)

12. Khan, N., Islam, M. S., Shariff, A. A., Alam, M. M., & Kurasaki, M. (2017). Socio-demographic predictors and average annual rates of caesarean section in Bangladesh between 2004 and 2014. *PLOS ONE*, *12*(5), e0177579. https://doi.org/10.1371/journal.pone.0177579

13. Kibayeva, A., Tussupova, L., & Gize, R. (2022). Method of human capital assessment in the digital economy of Kazakhstan. *"TuRan" Universitetìnìņ Habarsysy,* 2, 261–267. https://doi.org/10.46914/1562-2959-2022-1-2-261-267

14. Kireyeva, A. A., Nurlanova, N. K., Kenzhegulova, G., & Kenzheali, Y. (2022). Assessment of the Level of Depression and Vulnerability of Settlements: on the Example of the Regions of Western Kazakhstan. *Qainar Journal of Social Science, 1*(4), 35–48. https://doi.org/10.58732/2958-7212-2022-4-35-48

15. Kudaibergenova, D. T., & Laruelle, M. (2022). Making sense of the January 2022 protests in Kazakhstan: failing legitimacy, culture of protests, and elite readjustments. *Post-soviet Affairs, 38*(6), 441–459. https://doi.org/10.1080/1060586x.2022.2077060

16. Lee, J. Y., & Lubienski, C. (2017). The Impact of School Closures on Equity of Access in Chicago. *Education and Urban Society*, *49*(1), 53–80. https://doi.org/10.1177/0013124516630601

17. Lyratzopoulos, G., Abel, G., Brown, C. M., Rous, B., Vernon, S. A., Roland, M., & Greenberg, D. R. (2013). Socio-demographic inequalities in stage of cancer diagnosis: evidence from patients with

female breast, lung, colon, rectal, prostate, renal, bladder, melanoma, ovarian and endometrial cancer. *Annals of Oncology*, *24*(3), 843–850. https://doi.org/10.1093/annonc/mds526

18. Lyons, T., & Ewing, R. (2021). Does transit moderate spatial mismatch? The effects of transit and compactness on regional economic outcomes. *Cities,* 113, 103160. https://doi.org/10.1016/j.cities.2021.103160

19. Mansurova, G. (2015). Depressed regions: basic concepts and causes of transition to a depressed state. *Bulletin of Ulyanovsk Technical State University, 69*(1), 65–68. (in Russ.)

20. Milenković, N., Vukmirović, J., Bulajic, M., & Radojicic, Z. (2014). A multivariate approach in measuring socio-economic development of MENA countries. *Economic Modelling*, 38, 604–608. https://doi.org/10.1016/j.econmod.2014.02.011

21. Myers, R., & Hansen, C. (2020). Revisiting A Theory of Access: A review. *Society & Natural Resources, 33*(2), 146–166. https://doi.org/10.1080/08941920.2018.1560522

22. Piscitello, J., Kim, Y. H., Orooji, M., & Robison, S. B. (2021). Sociodemographic risk, school engagement, and community characteristics: A mediated approach to understanding high school dropout. *Children and Youth Services Review,* 133, 106347. https://doi.org/10.1016/j.childyouth.2021.106347

23. Pou, S. A., Del Pilar Díaz, M., Velázquez, G. A., & Aballay, L. R. (2021). Sociodemographic disparities and contextual factors in obesity: updated evidence from a National Survey of Risk Factors for Chronic Diseases. *Public Health Nutrition, 25*(12), 3377–3389. https://doi.org/10.1017/s1368980021004924

24. Sagadiev, K. (2004). *Economy of Kazakhstan: Essays on Current Issues.* (in Russ.)

25. Salzhanova, Z. S., & Gelashvili, N. N. (2017). Analysis of disproportions of the socio-economic development of the regions of the Republic of Kazakhstan. *Vestnik of Adygei State University. Serie 5: Economics.* (in Russ.)

26. Sermagambet, U., Satpayeva, Z. T., Smagulova, G., Urban, W., & Yessenzhigitova, R. (2022). Socio-economic inequality in Kazakhstani regions: Assessment and impact on regional development management. *Problems and Perspectives in Management*, *20*(3), 487–500. https://doi.org/10.21511/ppm.20(3).2022.39

27. Simonyan, R. H. (2017). Migration attitudes of Russian youth: A regional dimension. *Monitoring of Public Opinion: Economic and Social Changes*, *6*, 313-326. https://doi.org/10.14515/monitoring.2017.6.16

28. Spankulova, L., Karatayev, M., & Clarke, M. L. (2020). Trends in Socioeconomic Health Inequalities in Kazakhstan. *Communist and Post-communist Studies*, *53*(2), 177–190. https://doi.org/10.1525/cpcs.2020.53.2.177

29. Stasiūnienė, J., Justickis, V., & Jasulaitis, A. (2015). Newborn Murder and its Legal Prevention. *Sveikatos Politika Ir Valdymas, 1*(8), 91. https://doi.org/10.13165/spv-15-1-8-05

30. Tandrayen-Ragoobur, V., & Narsoo, J. (2022). Early human capital: the driving force to economic growth in island economies. *International Journal of Social Economics, 49*(11), 1680–1695. https://doi.org/10.1108/ijse-11-2021-0674

31. Temirova A.B., & Abdimomynova A.Sh. (2016). Socio-economic differentiation of the regions of the Republic of Kazakhstan. *Vestnik of the Peoples' Friendship University of Russia. Series: Economics,* 1, 58-69. (in Russ.)

32. Vigl, M., Niggemeyer, E., Hager, A., Schwedler, G., Kropf, S., & Bauer, U. M. M. (2011). The importance of socio-demographic factors for the quality of life of adults with congenital heart disease. *Quality of Life Research, 20*(2), 169–177. https://doi.org/10.1007/s11136-010-9741-2

33. Zhang, Y., Kumar, S., Huang, X., & Yuan, Y. (2023). Human capital quality and the regional economic growth: Evidence from China. *Journal of Asian Economics,* 86, 101593. https://doi.org/10.1016/j.asieco.2023.101593

AUTHOR BIOGRAPHIES

*Anna A. Kredina – PhD Candidate, Finance and Accounting Chair, K.Sagadiyev University of International Business, Almaty, Kazakhstan. Email: anna.kredina@uib.kz, ORCID ID: https://orcid.org/0000-0002-7682-2727

92

Leila K. Mardenova – PhD Candidate, Management and Business Chair, K.Sagadiyev University of International Business, Almaty, Kazakhstan. Email: mardenova.lei@uib.kz, ORCID ID: https://orcid.org/0000-0003-0510-3765

Alexander A. Tsoy – Researcher, K.Sagadiyev University of International Business, Almaty, Kazakhstan. Email: alt-kct@mail.ru, ORCID ID: https://orcid.org/0000-0002-7054-6063