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STATISTICAL ANALYSIS OF DYNAMICS AND TRENDS OF DEATH INDICATORS OF THE REPUBLIC OF KARAKALPAKSTAN

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ABSTRACT	DOI No: 10.36713/epra17226	Article DOI: https://doi.org/10.36713/epra17226

This article examines the dynamics of absolute and relative mortality rates of the population of the Republic of Karakalpakstan over a 20-year period, and compares the position of these indicators in cities and villages.

Also, in the context of regional cities of the Republic of Karakalpakstan, mortality rates were analyzed through cross-comparison, the indicators of regional cities were examined based on international criteria, and the causes of death of the deceased were analyzed.

In addition, the dynamics of infant mortality in the Republic of Karakalpakstan was studied and an analysis was carried out of the causes of death by year, as well as those who died under the age of 1 year.

A comparison and analysis of the dynamics of life expectancy at birth in the Republic of Karakalpakstan in recent years has been carried out, and conclusions and proposals have been made based on all the analyses.

KEY WORDS: *death, causes of death, infant mortality, mortality rate and infant mortality rate, life expectancy at birth, mortality rate criteria.*

INTRODUCTION

The study of the dynamics of the population makes it possible to observe the main trend of its change, identify the main causes of these changes, determine the economic and demographic consequences of the influence of factors affecting, determining dynamic processes. It should be noted that economic and political factors themselves directly affect the dynamics of the population and structural changes in the demographic and social characteristics of the population. The ability to move freely both on and off the territory of the country, focus on success in the professional sphere, changes in employment, the ability to work from anywhere in the world, all this leads to the redistribution of the population between territories, labor spheres, labor markets, etc.

Scientists from foreign countries such as S. Prokhorova, N.V. Cheremisina, L.A. Davletshina, Y.A. Dolgix, G.P. Neverova, S.K. Jilyayeva, J.Yu. Yuzefovich, A.A. Maksimova, A.Ya. Kvasha, Z. Pavlik, A. Landry, P. Hauser and other scientists have done scientific work regarding the natural movement of the population as well as th births, deaths, marriages, and divorces.

Among the phenomena related to demographic processes, according to A.Kvasha[1], he identified the sum of births, deaths, marriages, divorces and migrations, which they considered to be the main factors in changing the number and structure of the population. Kvasha writes[2], a large number of such processes take place every year. In order to study these processes and determine their laws, it is necessary to understand the main trends of these processes. In addition, according to Kvasha, when analyzing demographic processes, it is necessary to

take into account their close connection with each other.

French demographer A. Landry developed the evolutionary theory of population growth, Czech demographer Z. Pavlik[3] and Russian demographer A. Kvasha[4] demonstrated the practical application of this theory.

American demographers P.Hauser and O.Duncan, talking about the difference between narrow and broad approaches in demography, called the first demographic analysis and the second population science. According to them demographic analysis, deals with the study of the components of population variation and their change. Population science focuses not only on demographic variables, but also on the relationship between population change and other variables - social, economic, political, biological, genetic, geographical, etc. The object of population science is at least the determinants and consequences of demographic trends, wrote American demographers [5].

Death is the process of extinction of a generation. Death is the final and irreversible cessation of signs of life any time after live birth. Death is a mass process consisting of many individual deaths that occur at different ages and which, in their sum, determine the order of extinction of a real or hypothetical generation. [6]. In statistics, death is defined as the ratio of the annual number of deaths to the average population in a year [7].

A. G. Vishnevsky defines birth as the process of having children, procreation, creation of new generations in the population. In his opinion, death is a process of permanent disappearance for generations [8].

The scientific works of Uzbek scientists I.K.Gulyamov, Sh.E.Dusnaev, N.B.Tula, D.N.Esengeldiev, etc., reflected the demographic development of the Republic of Uzbekistan, the natural and mechanical movement of the population, the natural growth of the population of the Republic of Karakalpakstan.

Population is one of the most important demographic characteristics. It is constantly changing due to the processes of birth, death, and migration. Therefore, it is necessary to take into account these demographic processes when analyzing the indicator. In addition, attention should be paid to administrative-territorial borders and population categories.

ANALYSIS AND RESULTS

Various methods of statistical analysis, such as statistical tables and graphs, induction and deduction, analysis and synthesis, were widely used in the research process of the natural movement of the population in the Republic of Karakalpakstan, in particular, the events of birth, death, marriage and divorce.

The death rate, together with the birth rate, is a very important demographic process that describes the natural movement of the population.

The table above shows the dynamics of the number of deaths of the Republic of Karakalpakstan in the period range of 20 years. Analysis of the table data shows that we can see that the dynamics of the number of people who died were at an almost stable level, without significant changes. But the increase in this rate in urban areas over the past 5 years, especially the increase in 2022 by 1564 people or 35.6% compared to 2021, has also greatly affected the total number of deaths (62.1% of total deaths fell to urban areas). In rural areas, however, we can see a decline if the 2020 figure is not taken into account (indicators have increased due to the COVID-19 pandemic).

Table 1
Dynamics of the number of deaths in the Republic of Karakalpakstan in 2003-2023

Years	Total	Urban	Rural	Growth rate (chain),%		
				Total	City	Urban
2003	8684	4275	4409	94.8	94.1	95.5
2004	8216	4024	4192	94.6	94.1	95.1
2005	9199	4571	4628	112.0	113.6	110.4
2006	8594	4185	4409	93.4	91.6	95.3
2007	8438	4124	4314	98.2	98.5	97.8
2008	8610	4190	4420	102.0	101,6	102,5
2009	8172	4009	4163	94.9	95,7	94,2
2010	8342	4270	4072	102.1	106,5	97,8
2011	8184	4222	3962	98,1	98,9	97,3
2012	8208	4244	3964	100,3	100,5	100,1
2013	8134	4114	4020	99,1	96,9	101,4
2014	8157	4174	3983	100,3	101,5	99,1
2015	8094	4138	3956	99,2	99,1	99,3

Years	Total	Urban	Rural	Growth rate (chain),%		
				Total	City	Urban
2016	8396	4289	4107	103,7	103,6	103,8
2017	8661	4370	4291	103,2	101,9	104,5
2018	8602	4306	4296	99,3	98,5	100,1
2019	8461	4281	4180	98,4	99,4	97,3
2020	9164	4764	4400	108,3	111,3	105,3
2021	8756	4386	4370	95,5	92,1	99,3
2022	9585	5950	3635	109,5	135,7	83,2
2023	10099	6433	3666	105,4	108,1	100,9

Source: Official website of the statistical portal Agency under the President of the Republic of Uzbekistan: http://www.siat.stat.uz.

Overall absolute mortality rates have increased over the last 20 years to see an increase of 1415 people or 16.3% compared to the bazis period, and an increase of 2158 people or 50.5% in urban areas, and a decrease of 743 people or 16.9% in rural areas.

In the same periods, the indicator of the death rate in the Republic of Karakalpakstan has a tendency to decrease on the contrary (table 2).
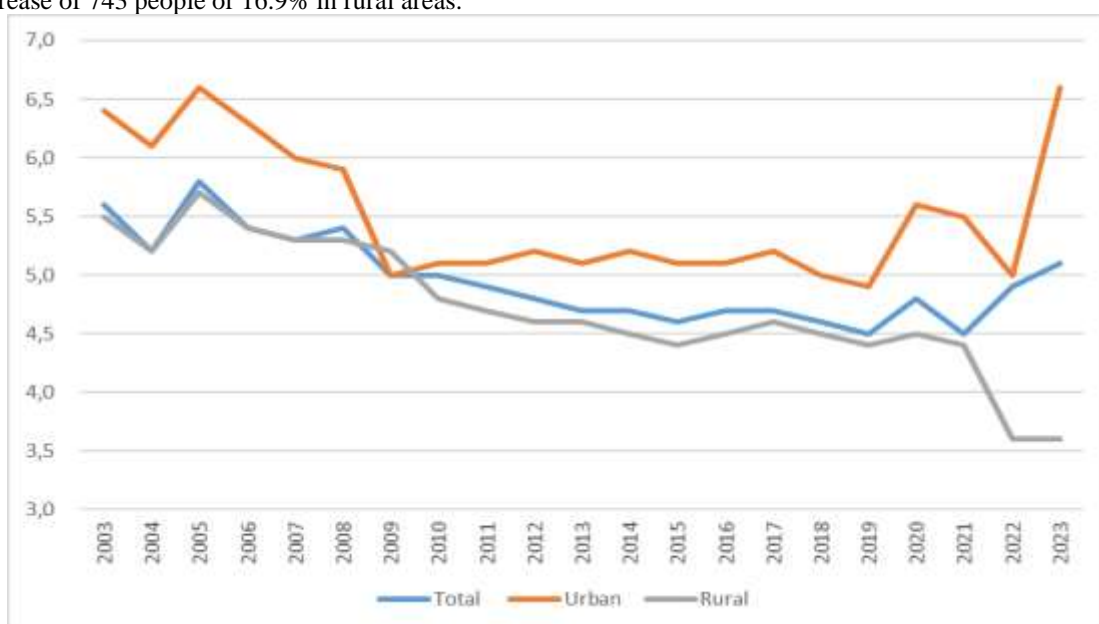

Figure 1. Dynamics of mortality rates in the Republic of Karakalpakstan in 2003-2023
(per 1000 people, promille)[9]

Figure was created by author according to official website of the statistical portal Agency under the President of the Republic of Uzbekistan: http://www.siat.stat.uz.

Analysis of the above figur data shows that the lowest was 4.5‰ (in urban areas 4.9 ‰ – 2019, in rural areas 3.6‰ – 2022 as well as 2023), recorded in 2019, while the highest was 5.8 ‰ in 2005 respectively in total, 6.6 ‰ in urban (in urban areas

this figure was also observed in 2023), and 5.7 ‰ in rural areas.

In 2023, this rate decreased by 0.5 ‰ or 8.9% (an increase of 0.2‰ or 3.1% in urban areas, a decrease of 1.9 ‰ or 34.5% in rural areas) compared to bazis year. It is noteworthy that both absolute and relative rates recognize an increase in mortality in urban areas and a decrease in rural areas.
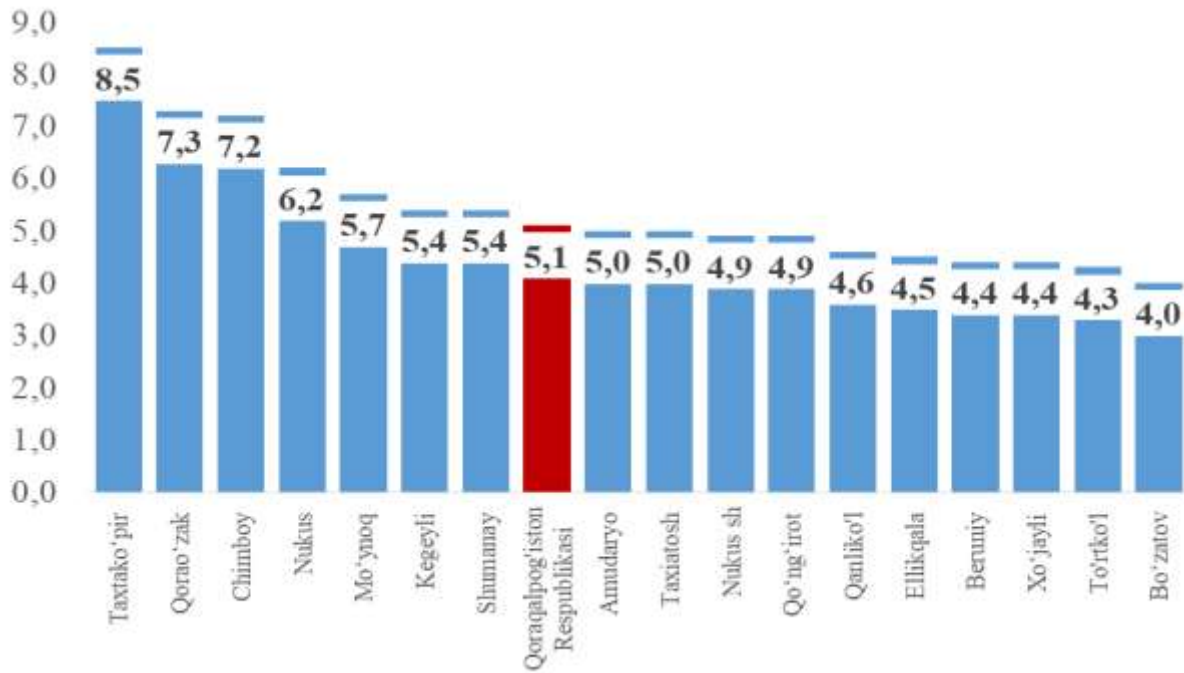
Figure 2. Mortality rate in regions of the Republic of Karakalpakstan in 2023[9]

The Figure 2 shows the mortality rate indicators recorded in 2023 of the district cities of the Republic of Karakalpakstan. We can see that the Takhtakopir (8.5‰), Karaozak (7.3‰), Chimboy (7.2‰), Nukus (6.2‰), Moynoq (5.7‰) , Kegeyli and Shumanay districts (5.4 ‰) are higher than the national indicator. In other districts, this indicator is lower than the national indicator. But according to the criteria of A.M. Merkov and L.M. Sukharebsky and G.S. Kildinnev, L.L. Kozlova, S. Ananyeva, these indicators are recorded as low and very low indicators.

Compared to the previous month in 2023, the largest increase in Takhtakopir district was 2.0 ‰ or 30.8% (2023 – 8.5 ‰, 2022 – 6.5 ‰), In Bozatob district, this indicator will be 4.8 ‰ in 2022, and in 2023 it will be 4.0 ‰, which is the biggest decrease, i.e. by 0.8 ‰ or 16.7% compared to last year.

The situation with the main causes of death of the total population is somewhat different and is described as follows.
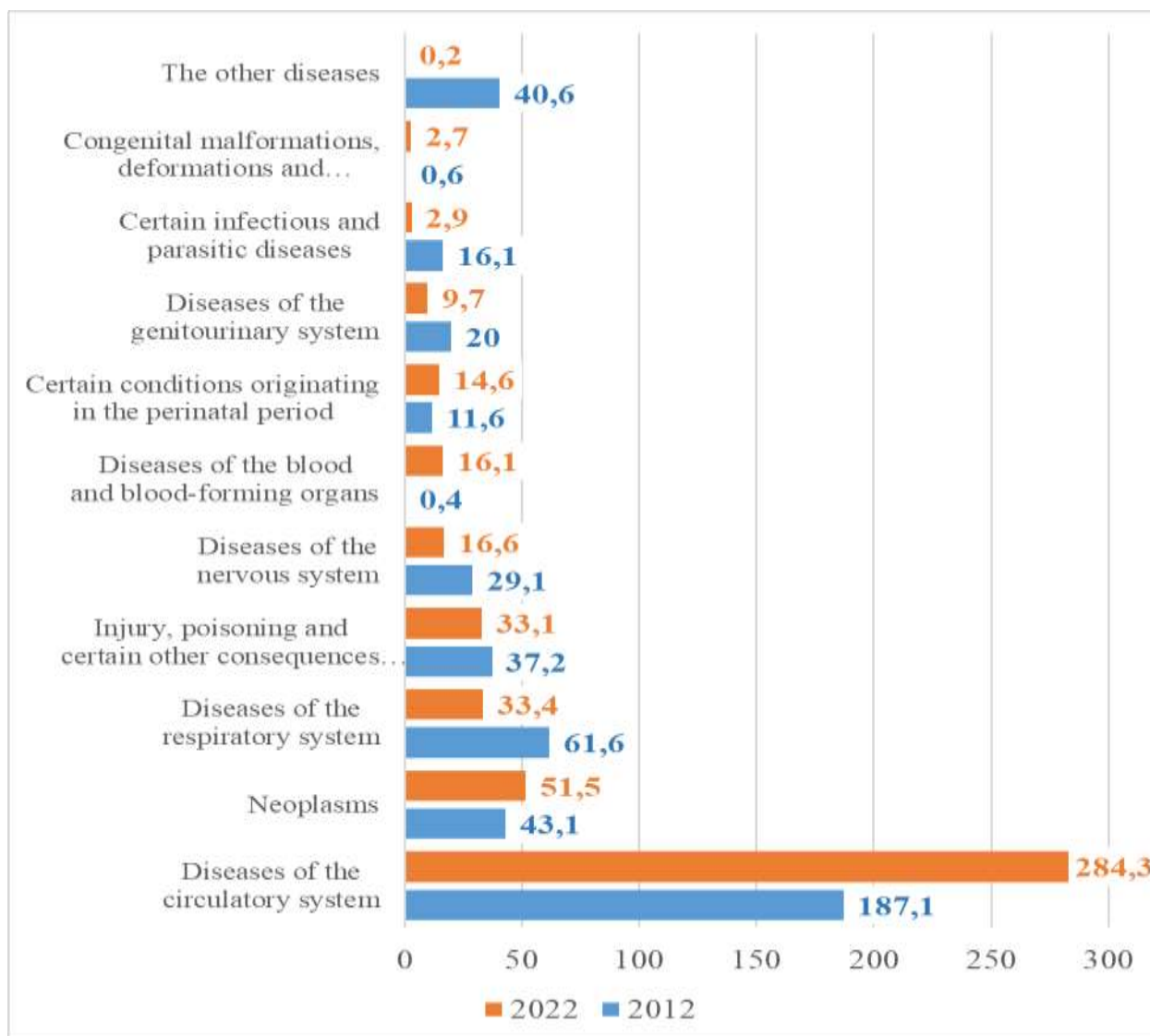
Figure 3. Mortality rate by main causes of death in the Republic of Karakalpakstan *(per 100,000 population)*[9]

Figure was created by author according to official website of the statistical portal Agency under the President of the Republic of Uzbekistan: http://www.siat.stat.uz.

Analyzing the data of the above figure 3, the main cause of death in the Republic of Karakalpakstan in 2022 was diseases of the circulatory system, which accounted for 58.2% of the total number of deaths. Compared to 2012, the situation almost did not change, and in 2012, the main cause of death was circulatory system diseases, which accounted for 38.8% of the total number of deaths.

A significant change in 10 years is that the share of respiratory diseases decreased from 12.8% of total deaths in 2012 to 6.8% in 2022, nervous system diseases decreased from 6.0% to 3.4%, morbidity and o external causes of infection from 7.7% to 6.8%, some infectious and parasitic diseases from 3.3% to 0.6%, diseases of the urogenital system from 4.1% to 2.0% and other diseases We can see a decrease from 8.4% to 0.03%.

Diseases of blood and blood-forming organs (from 0.1% to 3.3% of total deaths), tumors (from 8.9% to 10.5%), special conditions occurring in the perinatal period (2.4% to 3.0%), congenital anomalies (from 0.1% to 0.6%) and on the contrary, we can see that the indicators have increased somewhat.

Table 2
Distribution of death in the Republic of Karakaplogistan
in 2023 by age groups

Age	Total	Men	Women	Share of total, %		
Total	**10099**	**5607**	**4492**	**100.0**	**100.0**	**100.0**
0-4	681	380	301	6,8	3,8	3,0
5-9	131	87	44	1,3	0,9	0,4
10-14	99	69	30	**1,0**	**0,7**	**0,3**
15-19	124	81	43	1,2	0,8	0,4
20-24	138	82	56	1,4	0,8	0,6
25-29	99	60	39	**1,0**	0,6	0,4
30-34	153	93	60	1,5	0,9	0,6
35-39	227	140	87	2,2	1,3	0,9
40-44	375	221	154	3,7	2,2	1,5
45-49	484	297	187	4,8	2,9	1,9
50-54	537	323	214	5,3	3,2	2,1
55-59	1580	908	672	**15,6**	**9,0**	**6,6**
60-64	1102	639	463	10,9	6,3	4,6
65-69	1191	674	517	11,8	6,7	5,1
70-74	1012	525	487	10,0	5,2	4,8
75-79	764	403	361	7,6	4,0	3,6
80-84	757	365	392	7,5	3,6	3,9
85+	645	260	385	6,4	2,6	3,8

Source: Official website of the State Statistics Agency under the President of the Republic of Uzbekistan: http://www.stat.uz

Analysis of the data in the table above shows that in the Republic of Karakalpakstan in 2023, of the total number of deaths, 15.6% were aged 55-59 years, with the largest share among men being 9.0%, and among women 5.1%.

29.9% of all deaths in 2023 corresponded to the share of working age population, 72.5% of them were men, 27.5% were women, 60.8% were of working age. to the share of the elderly working age population, of which 46.7% were men and 53.3% were women.

Analyzing the causes of death of the working age population, 50.2% of them died from diseases of the circulatory system, 13.4% from cancern, 7.0% from external influences (accidents, suicides), 5.7% from diseases of the digestive organs.

To the indicator of the expected life expectancy at birth, naturally, the death rate in some way establishes. Thus, the analysis of mortality by the main classes of causes of death allows us to identify a number of problems, the solution of which is aimed at reducing the external causes of diseases of the circulatory system, respiratory and digestive disorders, morbidity and mortality, while the average life expectancy of the population of the Republic can increase.

CONCLUSIONS AND SUGGESTIONS
Based on the above analyzes, the following conclusions were drawn:

- The dynamics of the number of people who died were at an almost stable level, without significant changes.
- The increase in the number and ratio of deaths in urban areas over the past 5 years has also greatly affected the total number of deaths. In rural areas, the rate dropped.
- The district, cities of the Republic of Karakalpakstan had higher mortality rate than the republic's rate in 7 districts in 2023, but according to the criteria of A.M.Merkov and L.M.Sukharebsky and G.S.Kildinnev, L.L.Kozlova, S.Ananyeva, these indicators are recorded as low and very low indicators.
- In the Republic of Karakalpakstan, in 10 years, the main deadly diseases of the circulatory system were diseases.

Thus, the analysis showed that in the Republic of Karakalpakstan, from the point of view of demographic development, the situation can be assessed as stable. There is a downward trend in mortality as well as infant mortality rates recorded in the Republic. It should also be noted separately that the average life expectancy is growing from year to year.

Nevertheless, it is desirable if the work on this subject is further improved, focusing even more on the individual cases of the perinatal period, which are the main cause of infant mortality, in the health system.

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