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# POPULATION SITUATION ANALYSIS IN KYRGYZSTAN: 2020 UPDATE

**Demographic Challenges  
for Kyrgyz Republic Development  
Policy Brief**

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## **Table of contents:**

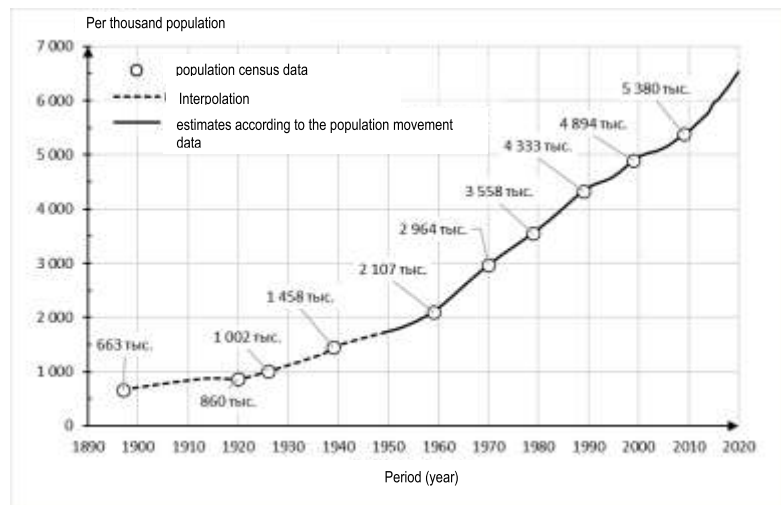
Context of the population dynamics in the Kyrgyz Republic.....	2
Geopolitical context.....	5
Population growth components in the Kyrgyz Republic.....	5
The problem of quantifying the real volume of migration exchange between the Kyrgyz Republic and foreign countries.....	8
Regional features of the population dynamics in the Kyrgyz Republic.....	9
Population structure by sex and age.....	17
Beginning of the population "aging" and its consequences.....	20
Dynamics of the socio-demographic groups.....	21
Population growth at working age: what are the implications for the labor market.....	23
Elderly population.....	24
Fertility, reproductive health, mortality and life expectancy.....	26
Fertility rate: stabilization at a high level.....	26
Fertility depending on woman's age: the model of family formation as a whole does not change.....	27
Adolescent fertility.....	28
Urban and Rural Fertility: Data Quality Issue.....	29
Ideal family size and fertility prospects.....	29
Intervals between births are very short.....	30
Abortion and contraception.....	36
Mortality and life expectancy.....	35
Accounting features and data quality problem.....	36
Infant mortality is declining, but regional differences are too great.....	36
Maternal mortality.....	40
Conclusions.....	41



The analysis of data on the movement and dynamics of the population structure of the Kyrgyz Republic over the past 5 years generally confirms the observations, conclusions and forecasts presented in the report on the demographic situation, which was prepared by a team of experts in 2017.

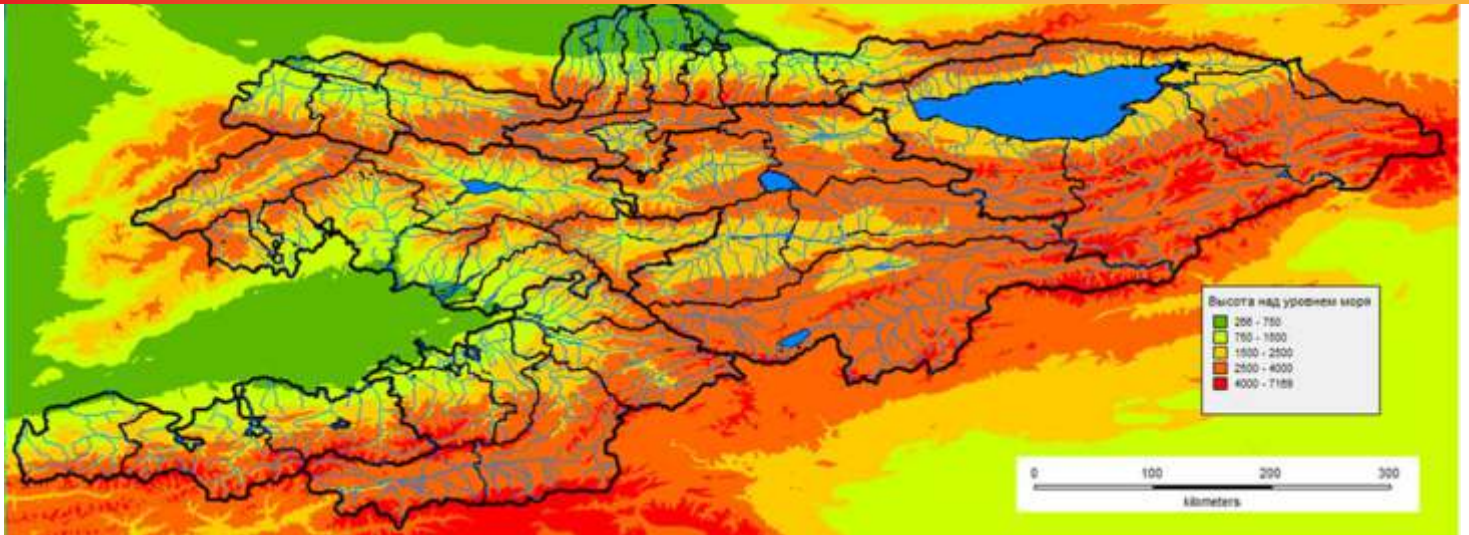


The problem of rapid population growth remains the most important and acute one. Over the past 5 years (from January 1, 2015 to January 1, 2020), the population of the Kyrgyz Republic has increased by almost 630 thousand people, or 11%. In 2020, according to the estimates of the National Statistical Committee of the Kyrgyz Republic (NSC KR), despite the COVID-19 epidemic, we can expect that only due to natural growth, the population of the republic will increase by at least 130 thousand people.



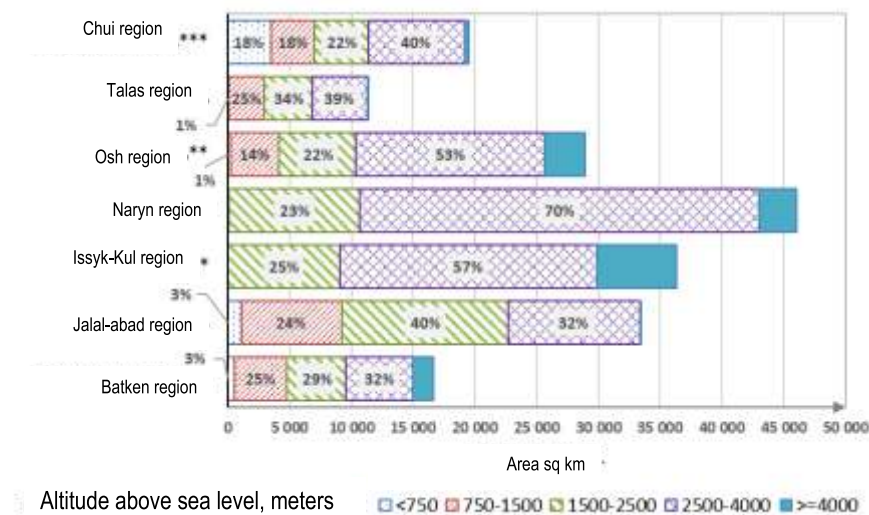
Graph 1: Population dynamics of the Kyrgyz Republic from 1897 to 2020

Such rapid population growth poses a significant threat to the lack of living space. Taking into account the fact that due to the special geographical conditions, the area of the territory suitable for comfortable living and conducting economic activities in the republic is extremely limited, further increase in population density will create an additional burden on the environment.



**Map 1:** Peculiarities of the relief of the Kyrgyz Republic

Formally, out of the entire territory that is comfortable in geographical and natural-climatic terms (less than 1500 meters above sea level), 32% is located in the Jalal-Abad region, 25% in the Chui region, 17% in Batken and 14% in Osh regions, the remaining 10% falls on the Talas region, and the territories of Naryn and Issyk-Kul regions lie entirely at an altitude of more than 1500 meters above sea level.



**Graph 2:** Distribution of the Kyrgyz Republic regions by height and areas

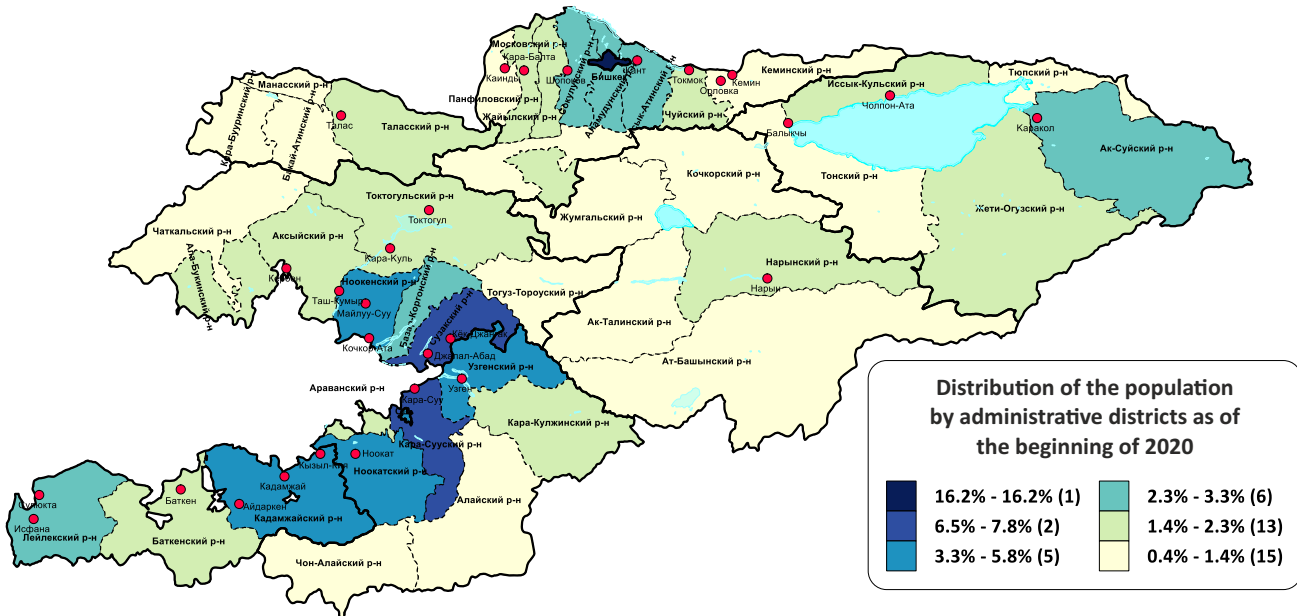
\* - excluding the area of the Issyk-Kul lake (6236 sq. km at the altitude of 1607 m. above the sea level.)

\*\* - including the area of the city of republican significance Osh

\*\* - including the area of the capital, the city of republican significance Bishkek

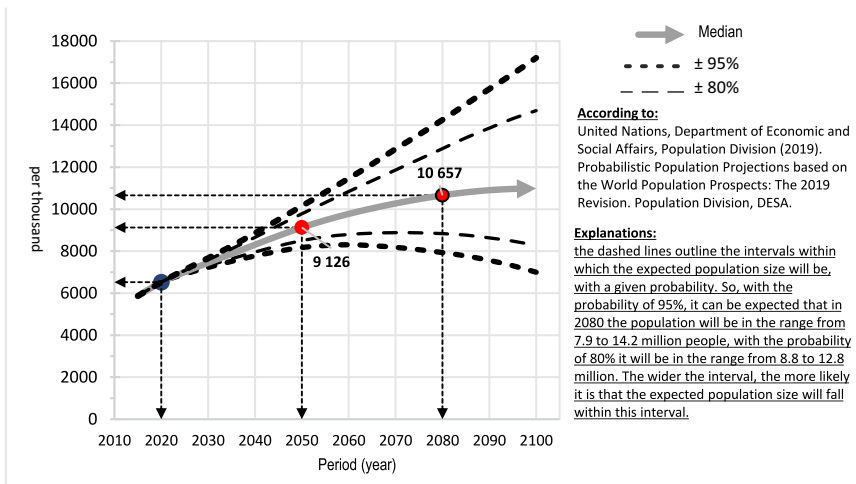
Due to the geographical features of Kyrgyzstan, the population is concentrated around two poles: the capital region, which includes the city of Bishkek and the adjacent administrative districts of the Chui region, and along the Osh – Jalal-Abad axis, in the areas of the "fertile crescent" bordering the Ferghana Valley (for 5 years from 2015 to 2020, the population concentration in both territories increased).





**Map 2:** Distribution of the population of the Kyrgyz Republic by administrative districts as of January 1, 2020.

According to the latest UN probabilistic forecasts, the population growth of the Kyrgyz Republic will continue at least until the end of this century. The fastest growth will be in the next 30 years, and by 2050 the population will exceed 9 million people, that is, an increase of 50% compared to 2020. Then the growth will slow down, and in the next 30 years the population of the republic will grow only by 1.5 million people (compared to the previous version, the current forecast was revised upwards)



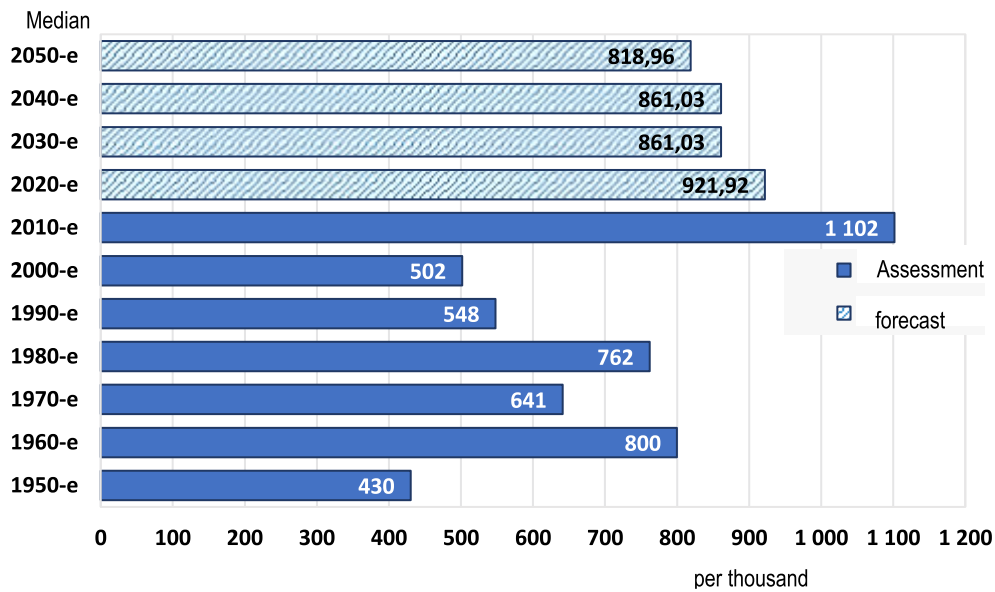
Over the past decade, the population of Kyrgyzstan has increased by more than 1.1 million people. This was probably the largest population increase in history. In the coming decades, population growth will also remain very significant.



**Graph 3:** Prospects for population growth in the Kyrgyz Republic until the end of the 21st century



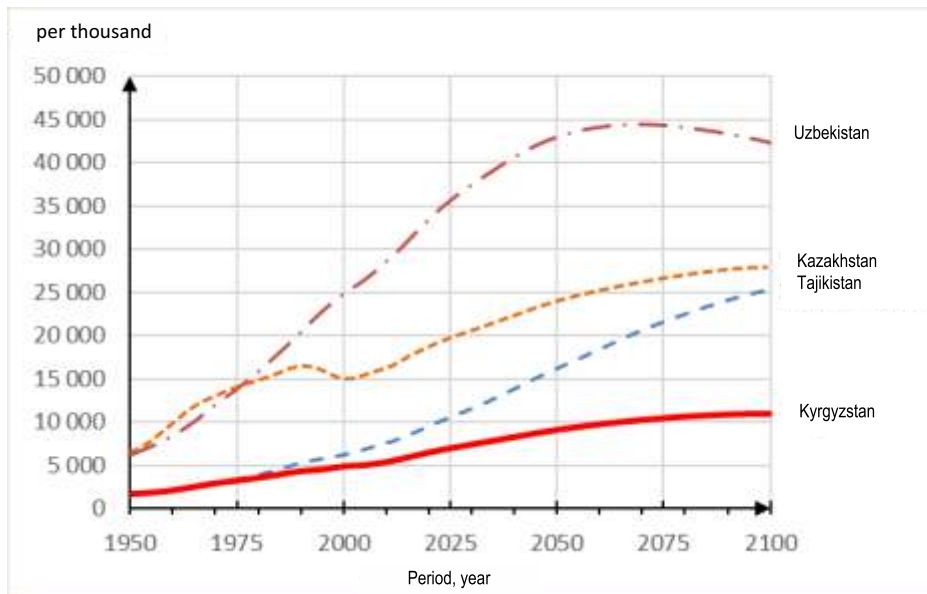
**Graph 4:** Historical and expected population growth of the Kyrgyz Republic by decades from 1950 to 2050



**Geopolitical context.**

Despite the rapid population growth, the Kyrgyz Republic remains the most sparsely populated country in Central Asia and the difference in the population size between the Kyrgyz Republic and its neighboring countries will only increase in the future. As a result, one can expect an increase of demographic pressure (migration) from Uzbekistan and Tajikistan, where the living space is already quite saturated, and reduction in opportunities for labor migration of Kyrgyzstanis to Kazakhstan, where the need for labor imports may decrease due to the growth of its own population.

**Graph 5:** Population dynamics of the Kyrgyz Republic and the neighboring countries



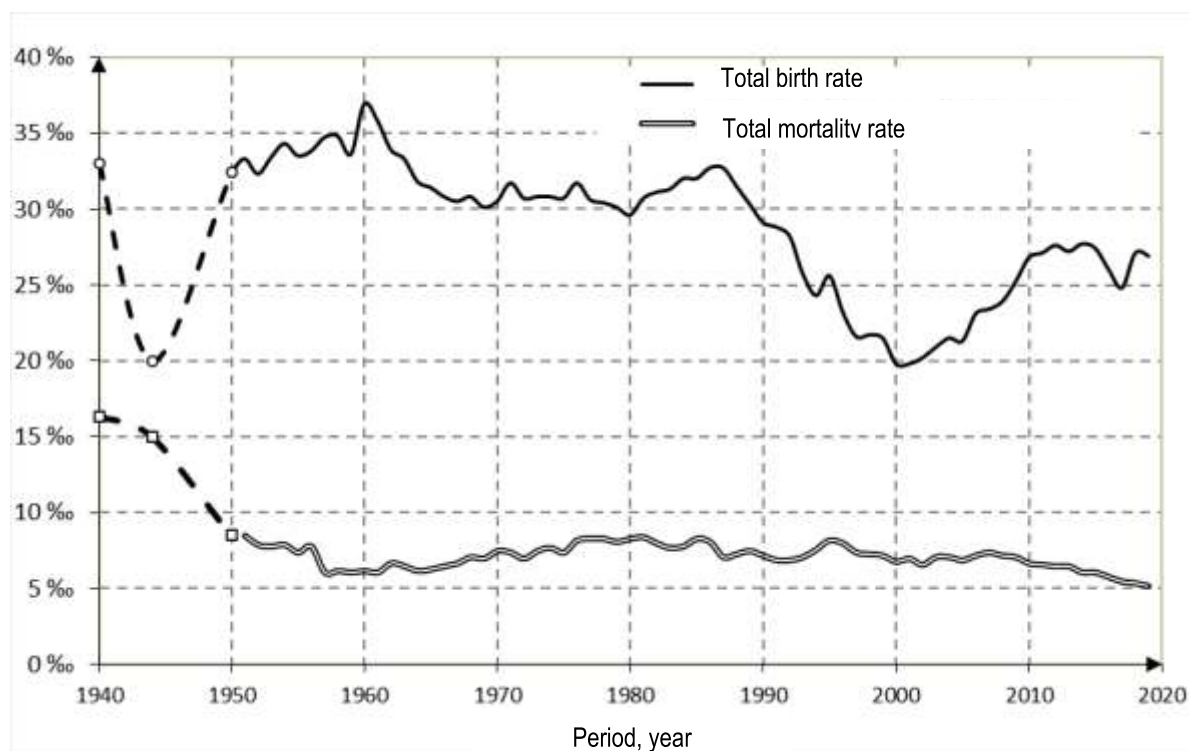
**Causes and components of population growth in the Kyrgyz Republic**

The rapid population growth in the Kyrgyz Republic is due to the peculiarities of the historical change in the population reproduction regime. The import of the latest medical technologies, the development of sanitary infrastructure and the availability of qualified medical care have led to a rapid reduction in mortality. At the same time, the preservation of the traditional way of life, especially in rural areas, combined with measures to support families with children (free education and medical care, benefits for large families), slowed down the decline in the birth rate.

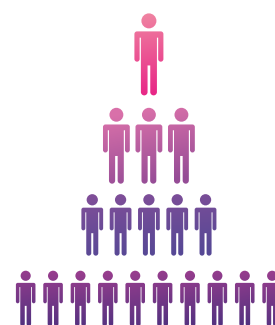


The rapid population growth did not create problems for the Kyrgyz Soviet Socialist Republic within the USSR, where social and economic risks were redistributed among all members of the union. This policy provided funding for the social sphere (health, education and culture), as well as job security and social protection of the population (old-age pensions, affordable medical care). After the collapse of the USSR, the solution of these tasks became the responsibility of the government of the Kyrgyz Republic, and rapid demographic growth became a national problem and a potential source of threat to the development of the national economy and the growth of the standard of living of the population.

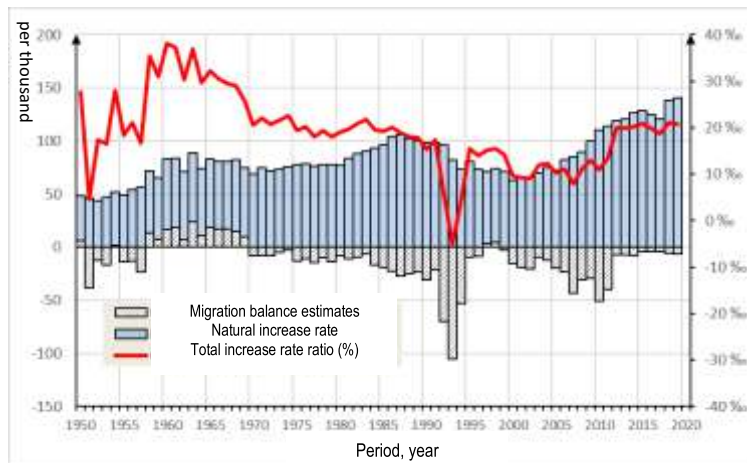
**Graph 6:** Features of the fertility and mortality dynamics in the Kyrgyz Republic from 1940 to 2020 (demographic transition).



The growth of the population of the Kyrgyz Republic is fully provided by the natural component, that is, the excess of the number of births over the number of deaths. On the contrary, the balance of migration in Kyrgyzstan has always been negative (more people left the republic than came to permanent residence), with the exception of the 1960s, when the flow of specialists was sent to the republic to work on the construction of large industrial and infrastructure facilities.



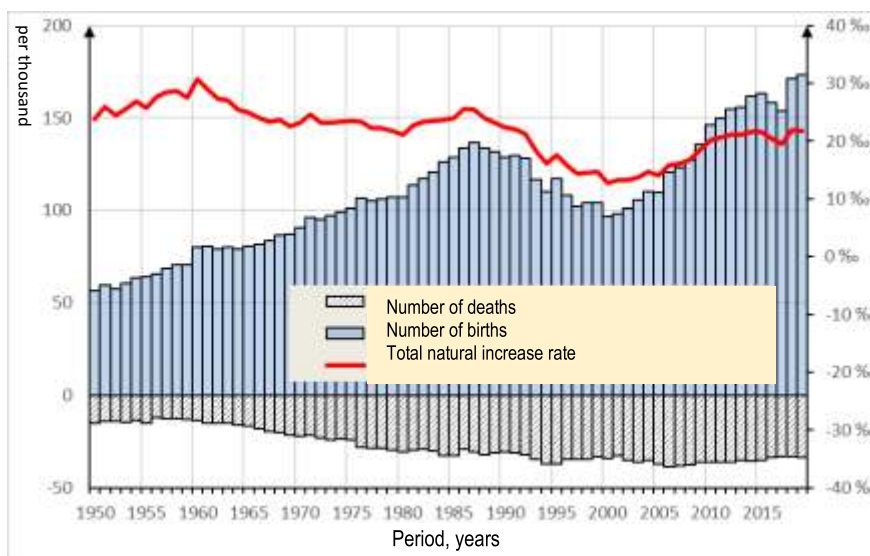
**Graph 7:** Components of the Population Growth in the Kyrgyz Republic from 1950 to 2020.



In turn, the amount of natural population growth in the Kyrgyz Republic is provided by a large number of births. According to the current UN forecast, the number of births will increase until at least 2020. This growth will occur both due to the peculiarities of the age structure of the population of the Kyrgyz Republic (the growing share of women of reproductive age in the total population), and due to the preservation of the ideal of a family with 3-4 children.

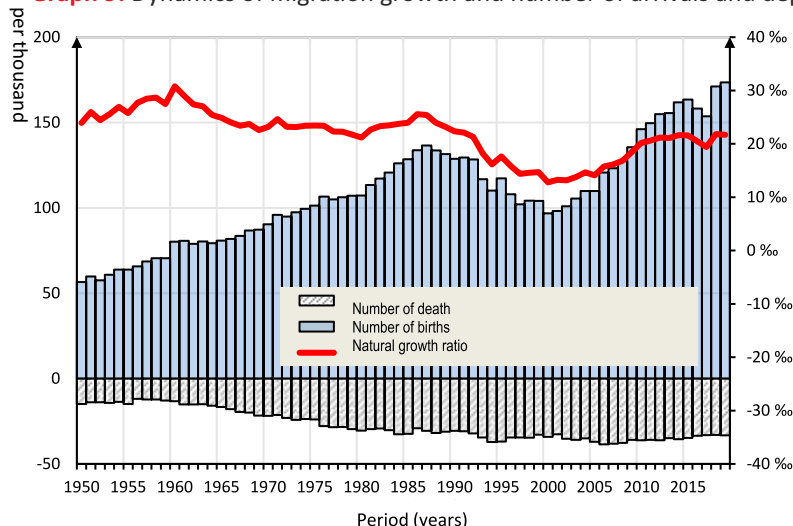
It is important to note that the increase in the number of births means, on the one hand, an increase in the need for medical care related to the course of pregnancy, childbirth and the postpartum period, and, on the other, an increase in the needs of a specific group of the population - infants and young children, adolescents and young people. That is, in the social dimension, behind the concept of "natural reproduction of the population" is the arrival of infants to replace the elderly and elderly people who are passing away, and, other things being equal, an increase in the number of children, adolescents and young people.

**Graph 8:** Dynamics of the natural increase rate (per thousand population), number of births and deaths in the Kyrgyz Republic from 1950 to 2020.



Usually, when the population grows in conditions of limited living space, migration plays the role of a safety valve, allowing to reduce the pressure of the population on resources. As already mentioned, the Kyrgyz Republic is historically characterized by a migration outflow of the population. The greatest values of the migration outflow in Kyrgyzstan reached in the 1990s, when, due to the collapse of the USSR, the country was left by ethnic groups whose historical homeland received a new political status (Russians, Ukrainians, Germans, etc.). Then the volume of migration (migration turnover) and the migration balance decreased, reaching the minimum size in the 2010s.

**Graph 9:** Dynamics of migration growth and number of arrivals and departures in the Kyrgyz Republic from 1950 to 2020.

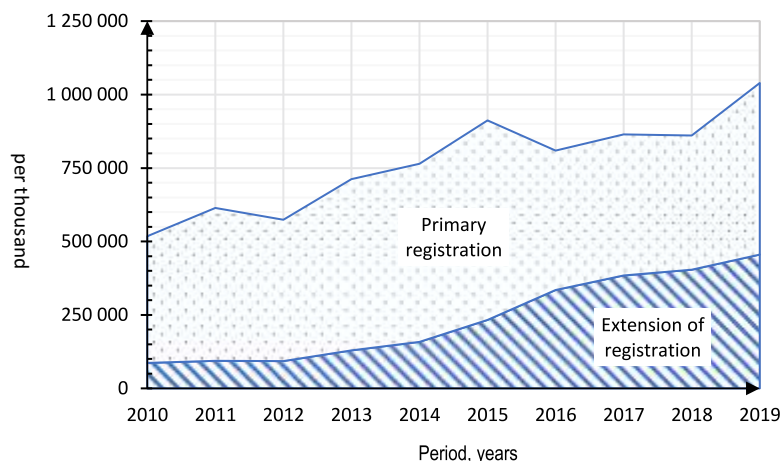


The ethnic component of external migration in the Kyrgyz Republic remains important to this day. Thus, among the people who left the republic over the past 5 years, ethnic Russians make up 40%, and in the structure of the migration balance, they made up 51%. It should be noted that over the past 10 years, the balance of external migration for all major ethnic groups has been negative.

**The problem of quantifying the real volume of migration exchange between the Kyrgyz Republic and foreign countries**

The decrease in the volume and balance of external migration in Kyrgyzstan is in some sense a statistical artifact. The fact is that the regulatory tables published by the Statistical Committee of the Kyrgyz Republic (section 5, tables 5.1-5.7) include only data on migrants who arrived and left for permanent residence, but do not say anything about the number of so-called "labor migrants", that is, those who left the country for temporary work, and those who came to the Kyrgyz Republic to earn money. Since the treaty on the Eurasian Economic Union (EAEU) has created conditions for the free movement of people and capital between the participating countries, it is possible to establish the fact of migration, in the broad sense of the word, based on the registration of a migrant in the country of arrival. If we take, for example, the Russian Federation, which was and remains the main direction of migration of citizens of the Kyrgyz Republic, then according to the accounting data of the Ministry of Internal Affairs of the Russian Federation in 2019, more than one million citizens of the Kyrgyz Republic (1055 thousand) were put on migration registration in Russia. Of this number, 584 thousand (55%) were accepted for primary registration, including 454 thousand indicated "work" as the motive. In addition, another 456 thousand resumed registration (in this case, there is no indication of the motive). In 2020, due to anti-epidemic measures, the number of primary registrations decreased by 2.3 times, but the trend of increasing the number of renewals remained, although it slowed down somewhat.

**Graph 10:** Number of the migration registration acts at the place of stay of visitors from the Kyrgyz Republic, made by the migration service agencies of the Ministry of Internal Affairs of the Russian Federation for 2010-2020\*.



In addition to registration at the place of residence, visiting foreigners and persons without citizenship can be registered at the place of residence in the Russian Federation. In 2017 and 2018, about 15 thousand citizens of the Kyrgyz Republic were registered at their place of residence per year, and in 2019 and 2020, the number of such registrations was about 12 thousand per year.

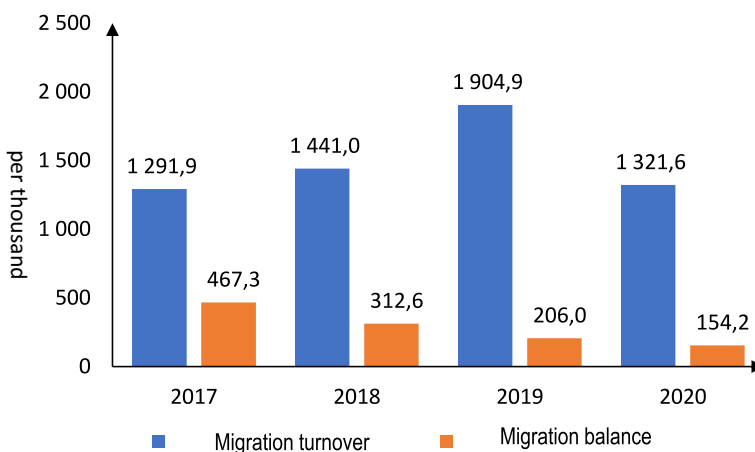


Source: <https://мвд.рф/Deljatelnost/statistics/migracionnaya>  
 \*- for 2020 preliminary expert estimates

The number of citizens of the Kyrgyz Republic removed from the migration register for the same period amounted to almost 849.4 thousand people. Thus, in 2019, taking into account labor migration, departure for study, etc., the volume of the real migration turnover of the Kyrgyz Republic with Russia alone was close to 2 million people, and the balance of labor migration in this direction was at least 200 thousand people, that is, it was almost 1.5 times more than the natural population growth and 20% more than the number of births.

**Graph 11:** Estimates of the volume and balance of “labor” migration between the Kyrgyz Republic and the Russian Federation based on the registration and deregistration of migration data for 2017-2020. \*

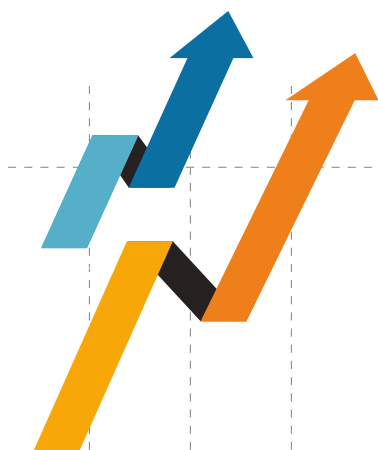
If we leave aside the year 2020, when the dynamics of migration flows, in all likelihood, was disrupted due to the Covid-19 pandemic, we can note the trend of an increase in the volume of “labor” migration (migration turnover) between the Kyrgyz Republic and the Russian Federation with a decrease in the balance. This allows us to hope for the stabilization of the migration exchange between the two countries (the number of arrivals is approaching the number of departures). At the same time, it is impossible to ignore the fact that the accumulated migration balance for 4 years amounted to almost 1.3 million people, that is, about 17% of



Source: <https://мвд.рф/Deljatelnost/statistics/migracionnaya>

the total population of the republic, or 28% of the population of working age (from 15 to 65 years). In other words, the Kyrgyz Republic exports almost a third of its own labor force (workers) to Russia alone.

The practice of accounting for expatriates as part of the cash and / or even permanent population should be taken into account when analyzing and evaluating changes in the territorial structure of the population, since, as already noted, the balance of labor migration only to Russia is comparable to the population of the Jalal-Abad region or the city of Bishkek.



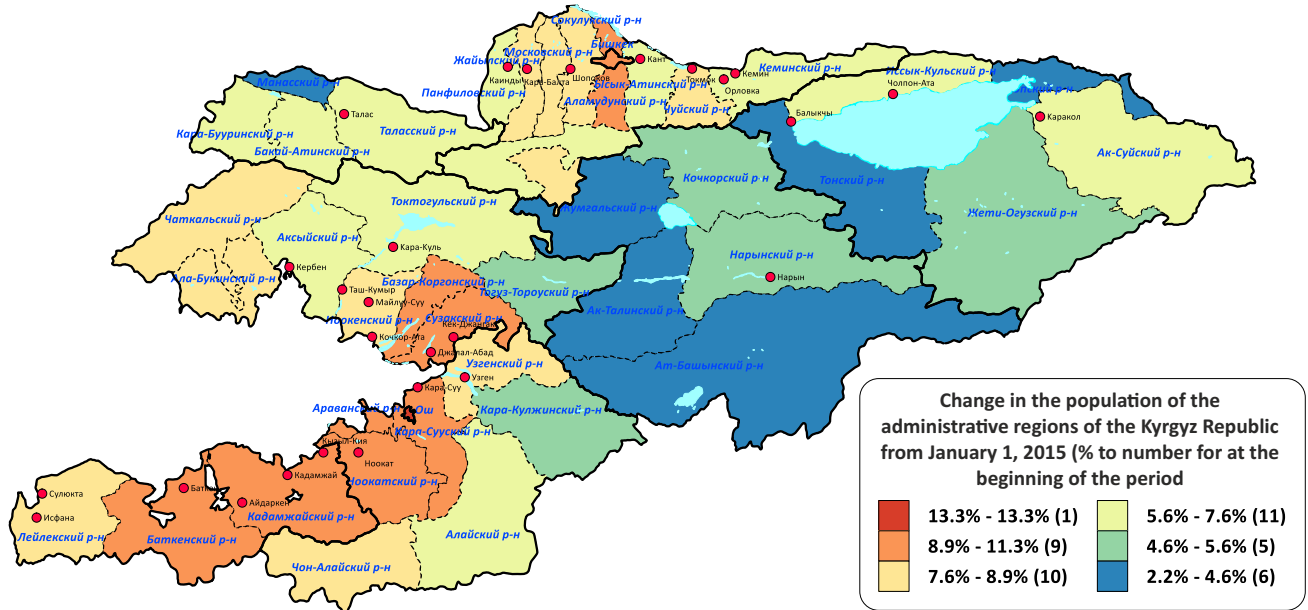
### Regional features of the population dynamics in the Kyrgyz Republic

Over the past 5 years, the population has increased not only in the republic as a whole, but also in all regions, administrative districts and cities of national significance. The most noticeable increase, by 13.3%, was the increase in the population of the city of Osh. The highest rates of population growth are observed in the areas of its greatest concentration, in the Chui region and along the border of the Ferghana Valley. We can say that the population grew the fastest in the most densely populated areas.



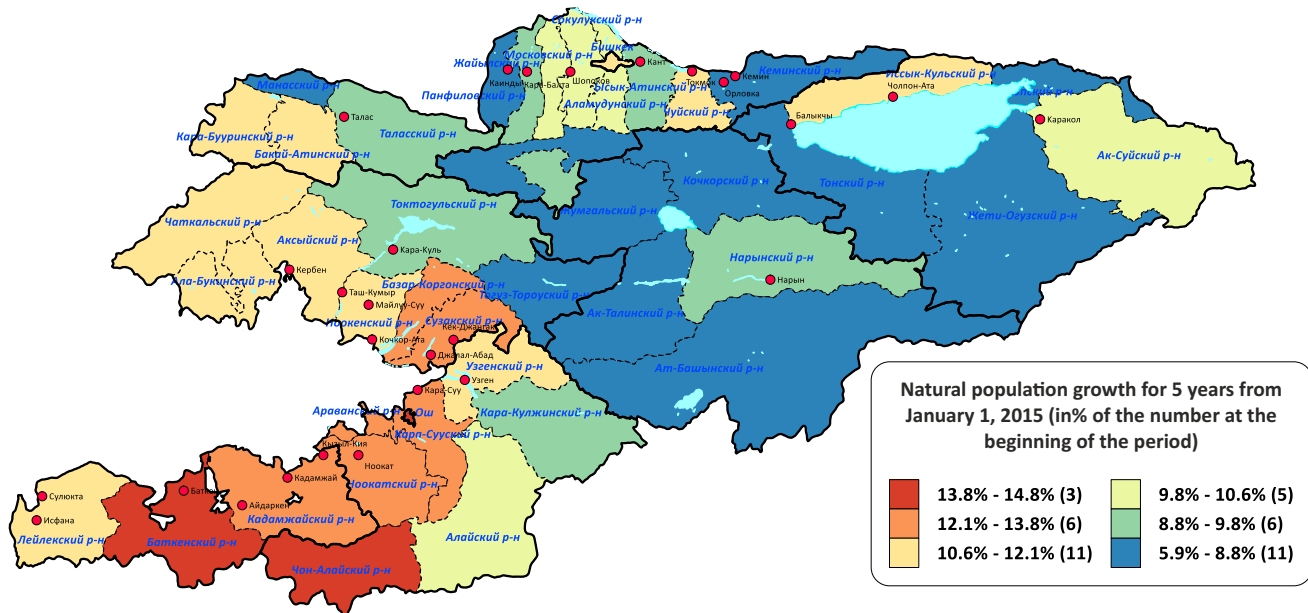
\* - an approximate estimate for 2020 based on the data for January-September with extrapolation for the last quarter based on the dynamics of registrations for previous years.

**Map 3:** Change of the population numbers in the administrative regions of the Kyrgyz Republic from January 1, 2015 to January 1, 2020.



In all administrative territories, the main component of population growth over the past 5 years was the excess of the number of births over the number of deaths, or natural growth. The leading positions in this indicator were occupied by the city of Osh, Chon-Alai district of Osh region and Batken district of Batken region, whose population increased by 14-15% over 5 years. No less significant, more than 10%, natural population growth was in the Kadamjaj district of Batken region, in the areas adjacent to the city of Osh, and in the Suzak and Bazar-Korgon districts of Jalal-Abad region.

**Map 4:** Population change in the administrative regions of the Kyrgyz Republic from January 1, 2015 to January 1, 2020 based on natural increase.

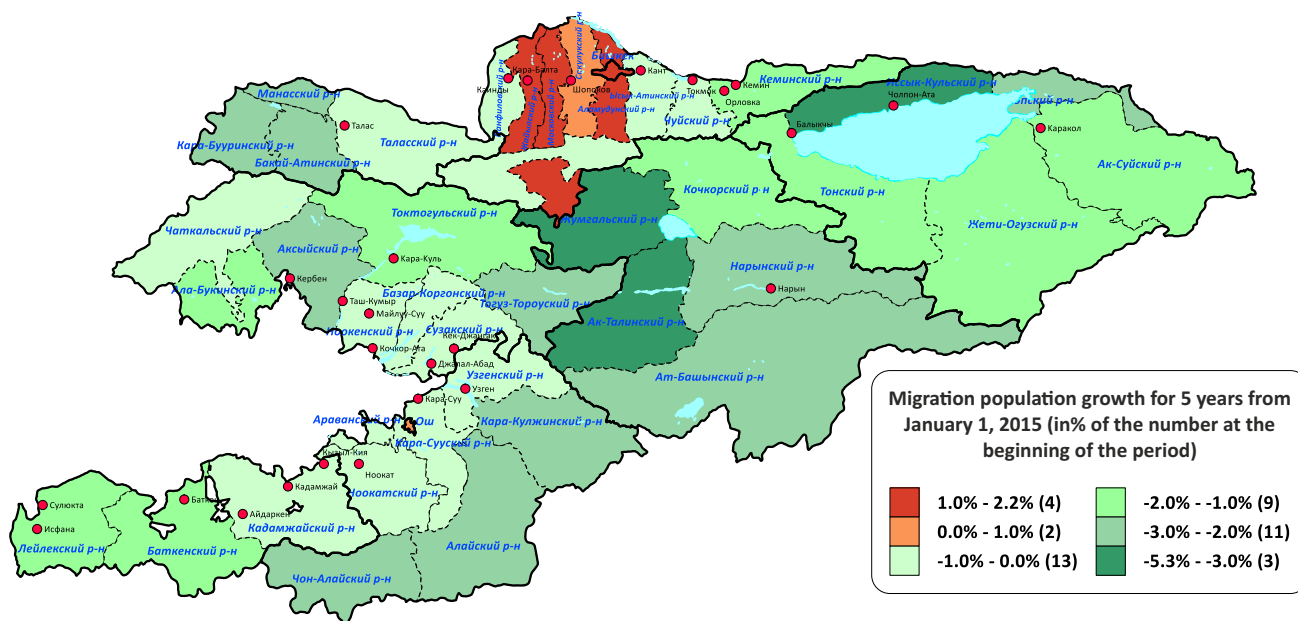


It should be noted that in areas of high population concentration, including the city of Bishkek, the natural increase was also quite large. On the contrary, the lowest natural growth was in the least populated rural areas of Naryn and Issyk-Kul regions, to which we should add Panfilov and Kemin districts of Chui region and Manas district of Talas region. The situation also looks a little unusual, because, as shown by the data of the Multi-cluster indicators of the 2018 survey (MICS-18), residents of the Chui region, the cities of Bishkek and Osh on average have fewer children than residents of other territories. It cannot be excluded that the inconsistency of state statistics and sample studies

is due to the practice of registering births not at the place of residence (registration) of the mother, but at the place of birth without subsequent forwarding of the birth certificate. Thus, there is a threat that in the state statistics data on the movement of the population are replaced by data on the work of the territorial bodies of civil registration. In other words, under these conditions, all indicators of population movement (birth rate, mortality, infant mortality, population changes), which are calculated in the territorial context, turn into a statistical fiction and become useless for the needs of public administration and development planning<sup>1</sup>.

Both external and internal migration plays a crucial role in shaping the population dynamics of the districts and regions of the Kyrgyz Republic. Over the past 5 years, a positive migration balance was observed only in the cities of Bishkek and Osh, as well as in the Alamudun, Sokoluk, Moscow and Jayilk districts of the Chui region adjacent to Bishkek. The lowest migration losses were suffered by the areas located in the zone of high population concentration: the "fertile crescent" adjacent to the Ferghana Valley and the border areas of the Chui region: Panfilov, Chui and Ysyk-Ata.

**Map 5:** Population change of administrative regions of the Kyrgyz Republic from January 1, 2015 to January 1, 2020 based on migration.



Migration and natural growth as components of population dynamics have different effects on the age structure of the population. If a high level of natural growth increases the population in childhood and adolescence, then migration is usually the lot of the working-age population. Unfortunately, the available data on official migration statistics (registration at the place of residence) in the Kyrgyz Republic do not allow us to quantify the direction of regional migration flows and the composition of migrants by gender and age.

The latest data on inter-regional migration flows (migration exchange matrix) were obtained based on the results of the 2008 census. They showed with sufficient evidence that the main migration flows from all regions were oriented in the direction of two cities of republican significance. Moreover, the most numerous flows were directed to Bishkek from the Naryn and Issyk-Kul regions. Less saturated flows are directed to the capital from the Jalal-Abad and Talas regions. It is important to note that the volume of migration flows in the direction of the capital is not

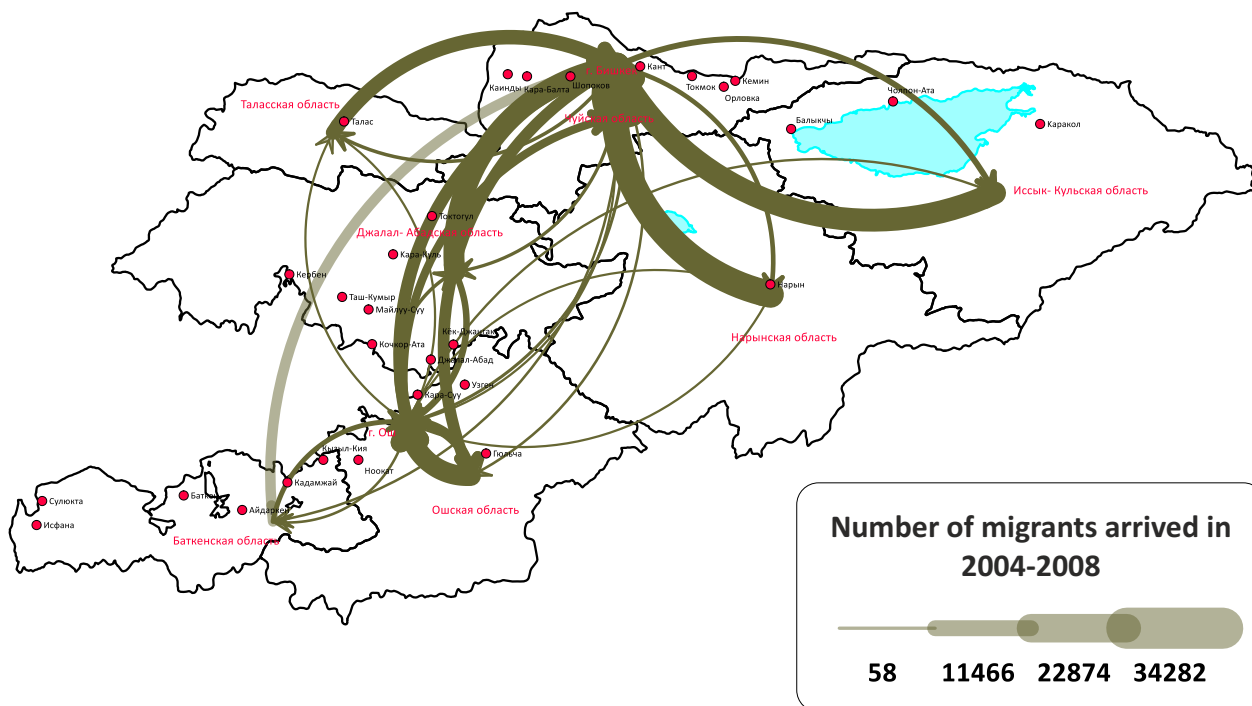
<sup>1</sup> The Law on Acts of the Civil Status of the Kyrgyz Republic dated April 12, 2005 No. 60 provided for the possibility of registering acts at the place of occurrence (birth, death) or at the place of residence (of parents of a deceased child), but without specifying the selection criteria, and without saying anything about the mechanisms and principles of the relationship between the civil registration authorities and the state statistics. The new Law on Acts of the Civil Status of the Kyrgyz Republic No. 110 dated August 1, 2020 adopted on August 1, 2020, states (article 11, paragraph 4) that "the civil registration authorities report to the statistics authorities of the Kyrgyz Republic information on the state registration of births, conclusion and dissolution of marriage and deaths", but it is established that geographically registered events are tied to the "place of submission of the application" (articles 15,21 and 32), which makes it even more problematic to compile statistics of the population movement in the territorial context.

proportional to the population of the outgoing migration areas. Within the framework of the metropolitan migration system, in all directions, the volume of incoming flows far exceeded the volume of flows originating from the same exchange line.

A special migration subsystem, within which a very intensive mutual exchange of population was carried out, is the city of Osh and the Osh region. In 2004-2008, approximately 40% of those leaving the cities and rural areas of Osh region went to Osh city and only 35% to Bishkek and Chui region. At the same time, for two people who came to the city of Osh from the region, there was one who left the city for the region.

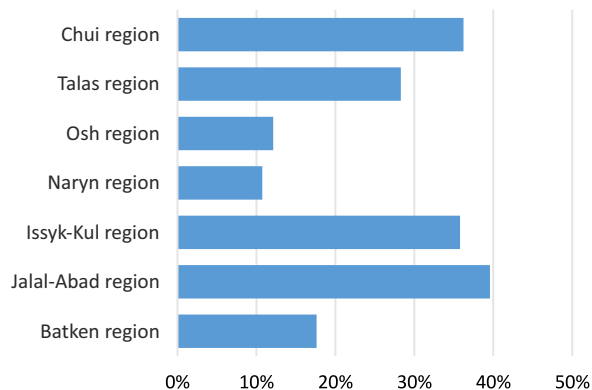
The migration exchange between Bishkek and the Chui region had a completely different polarity, where between 2004 and 2009, for one person who moved from the region to the capital, there were two people who left the capital for the region. It is possible that an important role here is played by the availability of transport and the road network, which allows you to increase the distance between your place of residence and your place of work.

**Map 6a:** Migration exchange of Bishkek and Osh cities with other regions of the Kyrgyz Republic for the period from 2004 to 2008 (according to the census).



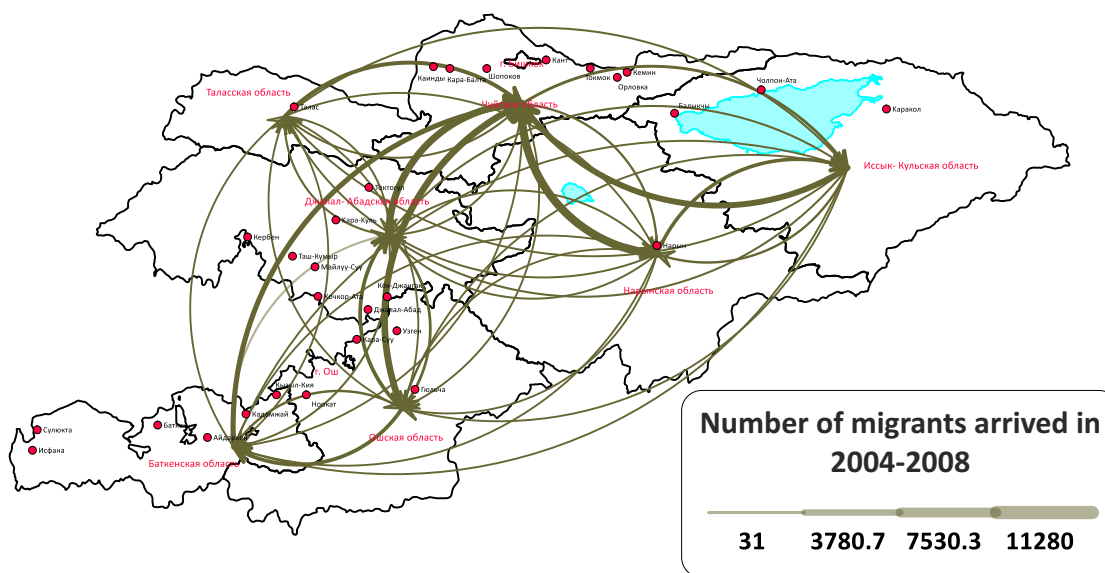
Changing the place of residence within the borders of one region is the second most important subsystem of internal migration of the population of the Kyrgyz Republic. At the same time, it seems that the volume of intra-regional migration largely depends on the number of urban settlements and the size of the urban population. Thus, the largest relative volume of intra-regional migration (the number of those who moved within the borders of the region in relation to the number of those who left their permanent place of residence) was in Jalal-Abad (40%), Issyk – Kul and Chui regions (36% each), and the smallest-in Naryn region.

**Graph 12:** The proportion of people changed the place of residence within the boundaries of a region among all leaving in the period from 2004 to 2008



The intensity of migration flows (the volume of migration exchange) between the regions of the republic (excluding the cities of Bishkek and Osh) was and remains insignificant. In this subsystem, the centers of gravity were located in the Chui and Osh regions. An important factor in the migration exchange between the regions is their geographical proximity. Thus, Batken and Jalal-Abad regions have closer ties with Osh region, while Talas, Issyk-Kul and Naryn regions have closer ties with Chui region.

**Map 6b:** Migration exchange between regions of the Kyrgyz Republic, excluding Bishkek and Osh cities, for the period from 2004 to 2008 (according to the census).



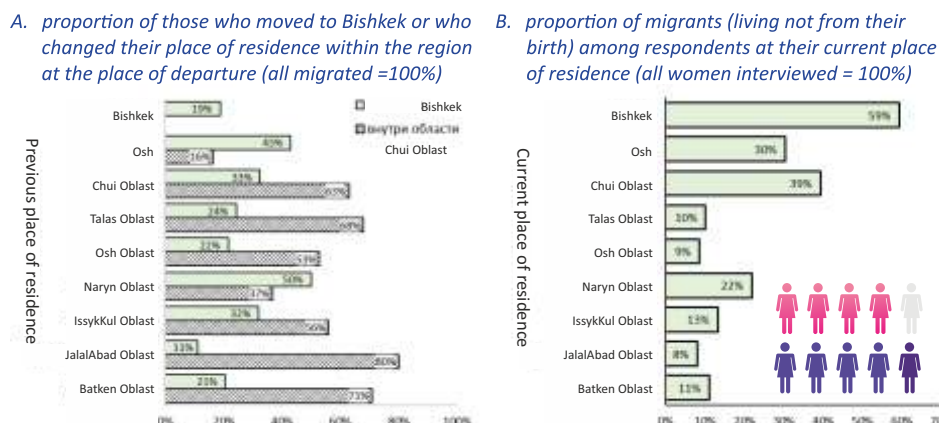
Although the data from the 2008 census are certainly outdated, it is nevertheless not without reason to believe that, in general, the described system of internal migration remains relevant to this day. According to the data (MICS-2018), which can only be used to judge the migration behavior of women aged 15-49 at the time of the survey, intra-regional migration and migration towards the two largest cities remain the main components of the migration system (at least for this category of the population).



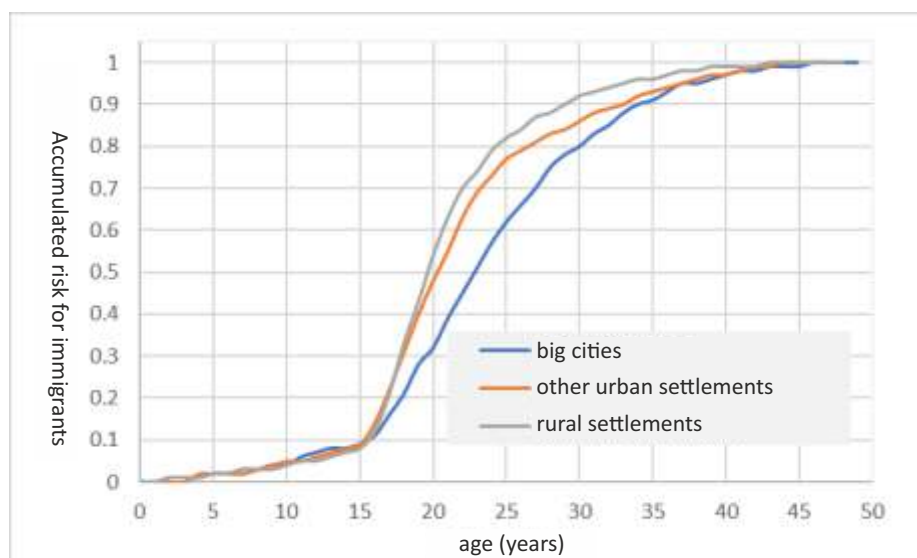


**Graph 13:** Assessment of the main directions of intra-republican migration among 15-49 years old women according to MICS-18 data in the Kyrgyz Republic (weighted data)

In addition, MICS -2018 data allow us to assess the age profile of intra-Republican migration. Thus, the average age of women who leave rural localities is 20.7 years (including to another rural locality), those who leave small and medium – sized cities-21.3, and the average age of residents of large cities who change their place of residence is 23.8 years.



**Graph 14:** Distribution (cumulative total) by age of women who arrived at the last place of residence as of the date of the survey, depending on the type of settlement they left.



The analysis was based on answers to questions about age at the time of the survey, about the duration of residence at the place of examination and about the type of settlement, from which the interviewee came, asked in the framework of MICS-2018 survey.

Explanation for reading the graph: 82% of women from the total number who came to their last place of residence from rural areas left their previous place of residence before reaching 25 years.

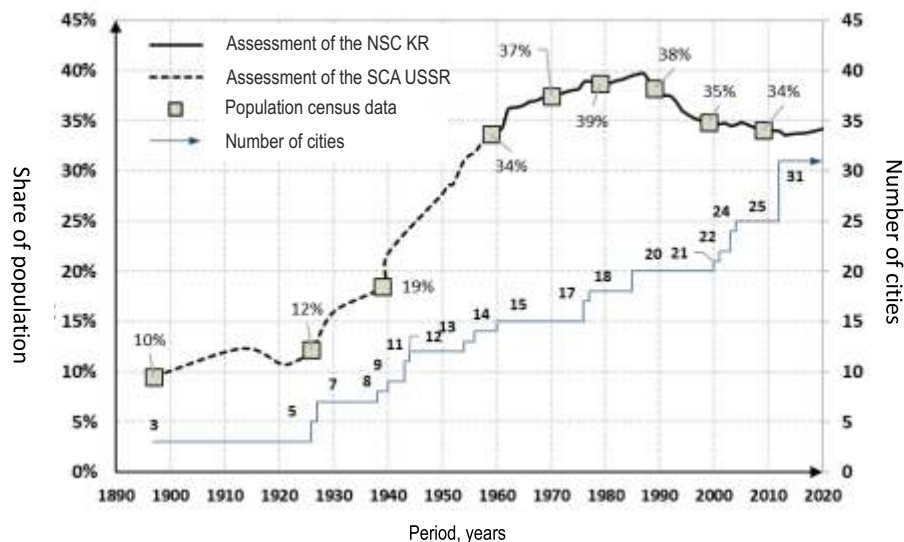
Unfortunately, MICS-2018 data does not allow us to trace the chain of migration, which can begin in rural areas, then lead from a small city to an average city and end in a large city. These studies do not allow us to judge the motives of migration. Taking into account that only women were interviewed, the reason for moving to another locality could be marriage, but also leaving for study or in search of work immediately after graduating from secondary school. Nevertheless, an important conclusion that can be drawn from this analysis is that migration activity increases very quickly when girls reach the age of 15, regardless of the type of settlement, and almost ends when they reach the age of 30 for those moving from rural areas and 33-35 years for those moving from small and large cities, respectively.

Taking into account that the most likely motive for both external and internal migration is most often training (acquisition of a profession) and job search, it must be recognized that large cities with a developed educational network and an extensive labor market become natural poles of attraction for migration flows.



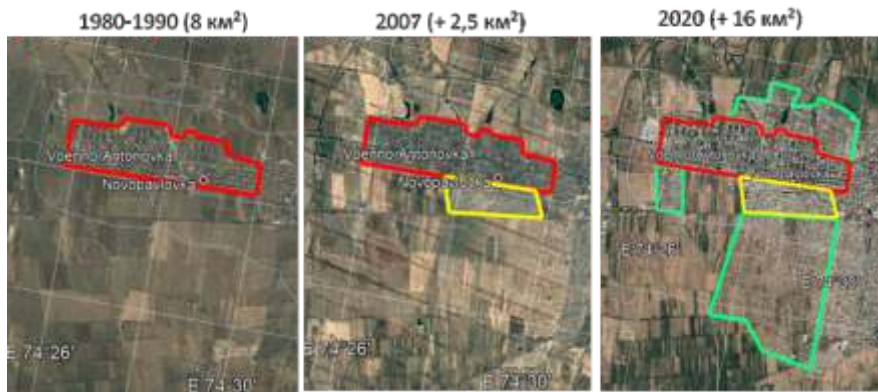
According to official statistics, the level of urbanization in the Kyrgyz Republic seems to be very low. According to estimates at the beginning of 2020, the share of the urban population does not exceed 35% of the population of the republic. At the same time, the concentration of the urban population is exceptionally high. Only in Bishkek, the number of inhabitants of which has already exceeded one million people, 49% of the urban population is concentrated. Another 12% of the urban population of the republic is concentrated in the city of Osh with a population of about 264 thousand people. Next in line is the city of Jalal-Abad, a regional center with a population of just over 100 thousand people. Of the other regional centers, the population exceeds 50 thousand people only in the cities of Karakol (Issyk-Kul region, 77 thousand inhabitants) and Tokmok (Chui region, 65 thousand inhabitants). All this suggests that weak urbanization is an important, if not the main reason for the concentration of population in and around the cities of Bishkek and Osh.

**Graph 15:** Dynamics of the share of urban population and growth in the number of urban settlements in the Kyrgyz Republic since the beginning of the 20th century.



The concentration of the population around the two republican metropolises (Bishkek and Osh) poses serious threats to the deterioration of the ecological situation and the reduction of agricultural areas. For example, today 44% of grain production and 94% of sugar beet are concentrated in the Chui region. Another threat is created by the practice of cottage construction, which is widespread in the expanding areas of urban development and leads to inefficient use and rapid degradation of urban infrastructure (access roads, sewerage, energy supply).

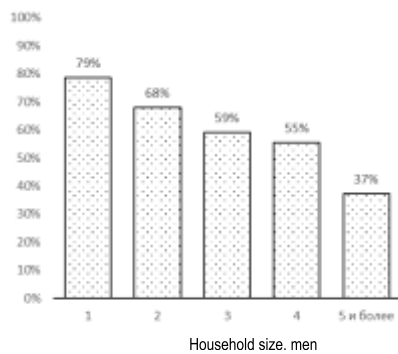
**Map 7:** Increase in residential development by occupying agricultural land in the eastern part of Bishkek between 1980 and 2020.



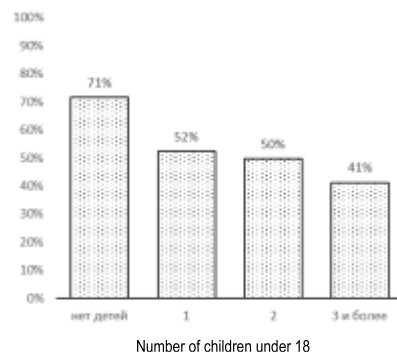
The quality of sanitary living conditions is a particular problem for the growing population of the Kyrgyz Republic. According to MICS-18 data, only 27% of households have access to a toilet with a spillway to the central sewer or septic tank. In rural areas, only 2% of households have access to such toilets, and this level is provided only by the Chui region, where 5% of households have access to a modern toilet; in other areas, such sanitary convenience is almost completely inaccessible to the population. In cities, 59% of households have access to a modern toilet. At the same time, if in Bishkek 74% of households are provided with drain sewerage, then in other regions less than half of them are provided. The situation is particularly bad in the urban settlements of Batken, Osh and Talas regions. In the city of Osh, a toilet with a spillway is available only for 44% of households. At the same time, the larger the size of the household (in the urban population) and the more children in the family, the less well off they are in terms of hygienic comfort.

**Graph 16:** Availability of a toilet with a drainage system (central or septic tank) depending on the household size and the number of children under the age of 18 in the urban population of the Kyrgyz Republic according to MICS-18 data (weighted data)

*A. Proportion of households with a flush toilet or septic tank, depending on the number of household members*



*B. Proportion of households with children under the age of 18 that have a toilet with a flush to the sewer or septic tank, depending on the number of children*



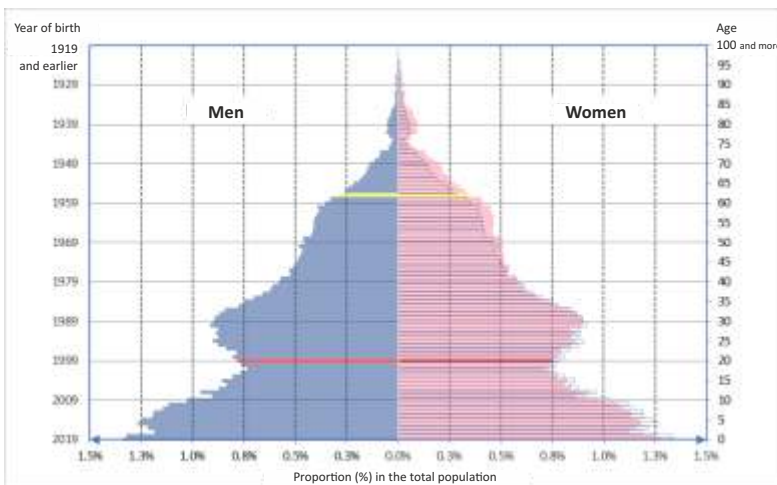
A comparison of the data from the 2014 and 2018 surveys does not allow us to draw a conclusion about the positive dynamics of the sanitary and living conditions of the population of the republic. The indicator of the availability of a modern and hygienic and environmentally safe toilet is the most important marker of the progressive and sustainable development of society, since behind the banal toilet in a city apartment or rural house are the most complex megastructures to ensure uninterrupted water supply, efficient drainage, safe treatment facilities and waste water recovery systems, which can only be created through significant investments in infrastructure development provided by appropriate government policies.

The ratio between the number of urban and rural population according to official data in the Kyrgyz Republic is absolutely not consistent with the level of economic development and the structure of production in the Kyrgyz Republic. According to the latest data, in 2014, only 31.6% of all those employed in the economy of the republic worked in agriculture (including forestry and fishing), and by 2018 this share had progressively decreased to 20.3%<sup>2</sup>. According to the integrated sample survey of household budgets and the labor force, the share of those employed in the agricultural sector of the economy was 18%. These data suggest that the actual level of urbanization in the Kyrgyz Republic is significantly higher than the official statistics indicate.

### Population structure by gender and age.

By demographic standards, the population of Kyrgyzstan is "young". Half of the residents of the republic are under 24 years of age (as of January 1, 2020, the median age was 24.06 years), - preschool children (under 7 years of age) they make up 17% of the population of the republic, and about 21% are schoolchildren (7-17 years old).

**Graph 17:** Population structure of the Kyrgyz Republic by sex and age as of January 1, 2020, (urban and rural population)



On the age pyramid of the modern population of the Kyrgyz Republic, you can see three "demographic waves", the emergence of which is due to the historical events of the 20th century.

It is not difficult to see two features of the deformation of the demographic pyramid of the population of the Kyrgyz Republic, which should be taken into account when planning development. First, it is a fairly constant period of wave passage, equal to about 30 years or the length of one generation. The first wave arose in connection with the decline in the birth rate during the Great Patriotic War (1941-1945), which in turn led to a decrease in the number of

births in the second half of the 1960s, when a small generation of "war children" entered the active reproductive age. The peak of the second wave occurred at the end of the 1980s, when the number of births increased both due to the large generation of mothers born in the early 1960s, and due to the measures introduced in the USSR in 1985-1987 to support young families. The third wave, the maximum of which falls at the end of the 2010s, is the children of those born at the turn of the 1990s, and the grandchildren of those born in the early 1960s. Secondly, it is that the wave amplitude (the quantitative ratio between the peaks) tends to decrease. Thus, the ratio between the number of generations born in 1989 and 1959 is approximately two to one, which is approximately equivalent to an average of 4 births per woman of the generation born in 1959. The ratio of generations born in 2019 and 1989 is just over 1.4, which corresponds to an average of 2.8-3 births per woman born in 1989.

<sup>2</sup> Women and men in the Kyrgyz Republic. 2015-2019, Statistical abstract. National Statistical Committee of the Kyrgyz Republic. Table 6.15

From the above, we can conclude that due to the peculiarities of the age structure, the dynamics of the population of the Kyrgyz Republic in many parameters will have a wave-like character at least until the end of the 21st century. All other things being equal, the amplitude and frequency of demographic waves may vary slightly under the influence of the dynamics of reproductive behavior. A decrease in the birth rate, if any, may lead to a depreciation of the amplitude of the demographic wave, and a lengthening of the family formation cycle (an increase in the average age of motherhood) will affect the length of the wave period. When planning for development, it is necessary to take into account the inevitability of a demographic wave with peaks in the late 2040s and 2070s. The demographic wave will have the greatest impact on the turnover of the labor force in the labor market and on the "demographic dividend", the concept of which ultimately boils down to the quantitative ratio of the number of producing and consuming population, that is, the demographic burden on the working-age population (dependency ratio).

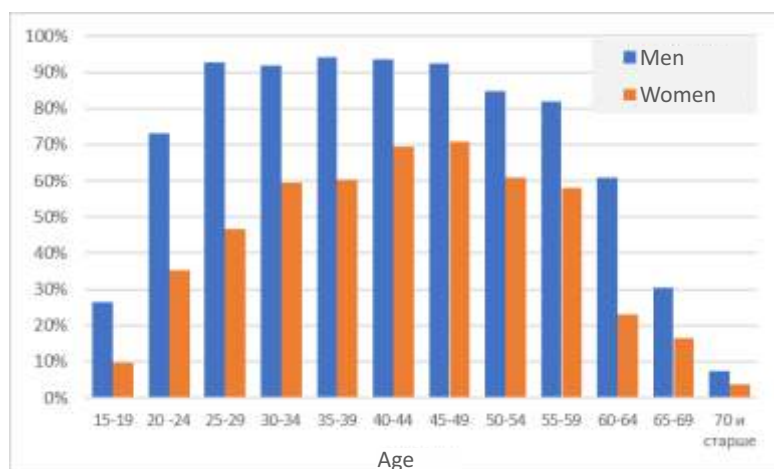
The assessment of the dynamics of the so-called demographic burden is particularly important from the point of view of development planning, since the well-being of the population largely depends on how and how the goods produced are distributed among socio-demographic groups. In the demographic dimension, this means the ratio between the population of working age and the population of under-age (child dependency ratio) or out of working age (old-age dependency ratio). When assessing the demographic burden, it is very important not to replace the categories of real social age with a legal fiction. For example, the legal age of entry into employment (the right to work for hire) does not mean that it is at this age that young people move from the economic category of consumers to the category of producers. Reaching retirement age also does not mean leaving the active population, although in some cases reaching the legal retirement age entitles you to receive a special benefit (for old age, for long service, under an insurance contract).

Today, the official statistics of the Kyrgyz Republic, which are available in open sources, do not give any opportunity to answer the question at what age labor activity begins and ends. Thus, the aggregated age group of 15-19 years, which we find in statistical publications, mixes categories that are radically different in terms of economic activity. This category includes schoolchildren, that is, children or adolescents aged 15 who are completing the cycle of compulsory secondary education, and schoolchildren aged 16-17 who are at the stage of specialized training, who are completing the cycle of universal secondary education. The category of 15-19 years includes persons who have reached and have not reached the legal age of marriage, those who continue their studies in secondary and higher educational institutions, and those who have actually started working. Published data show that in 2018, only 18% of the population aged 15-19 was considered economically active (working or looking for work). Among men, this proportion was about 27%, and among women – just under 10%. Among young men aged 20-24, the share of economically active people increases to 73%, and among women of this age group-to 35%. The maximum economic activity of men is shown at the age of 25-50 years (about 94%). For women, the maximum economic activity (about 70% of the population) occurs at the age of 40-49, when the formation of a family is completed.



**Graph 18:** The structure of the economically active population of the Kyrgyz Republic in 2018 (urban and rural population)

a) proportion of active population by gender and age in 2018 (each age and gender group = 100%)



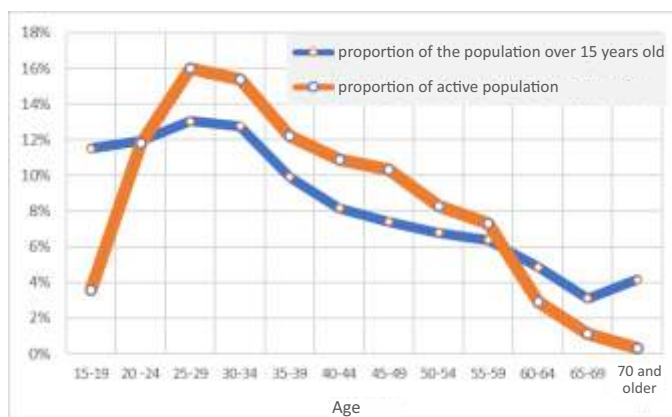
The quantitative assessment of the level of economic activity of the population by gender and age first makes it necessary to pay serious attention to the gender imbalance of economic activity of the population of the Kyrgyz Republic. In addition, it becomes possible to estimate the age of the beginning and end of economic activity, which can be used as the age at which half of the population is already economically active, and the age at which half of the population has already left the state of economic activity. In 2018, the median age of starting economic activity was 21.5 years for the entire population without distinction of gender, for men it was about 20

years, for women-almost 24 years. As for the median age of termination of economic activity, in 2018 it was 60.1 years for the entire population, for men this figure was 64.2 years, and for women-58.7 years, which is about a year more than the legal retirement age, which is currently 63 years for men and 58 years for women.

The choice of age limits for economic activity (median, average, or legal) affects the size of the demographic burden, but practically does not affect its dynamics. If the calculation is based on the legal age that gives the right to work for hire and the legal age that gives the right to an old-age pension, it turns out that in the next decade, the total demographic burden

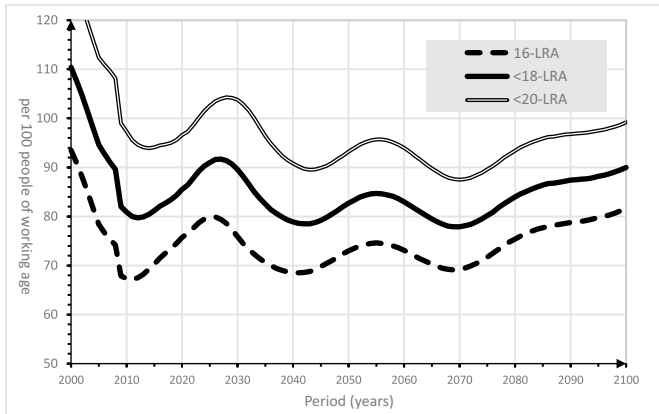
per 100 people of working age will average about 78 people. If we exclude the school-age population (under 18) from the active part, the workload will increase to 89, and if we use the median age of the beginning of working life, the workload will reach 95 people. In addition, if we take into account the gender imbalance of employment, the population that is not able to work for health reasons, as well as the privileged categories of pensioners, then the socio-demographic burden formed in this way is likely to exceed the threshold of 100 consumers only per 100 producers of total national income.

b) The age structure of the active population and the population over the age of 15 (the total size of each category = 100%)



Calculated from data: Statistical abstract of the Kyrgyz Republic, 2018, section 5 and Demographic abstract of the Kyrgyz Republic 2015-2019. Publication of the NSC KR // ... \Kyrgyzstan\2020\ workforce x age 2018.xlsx

**Graph 19:** Dynamics and prospects of the demographic burden at different values of the age of starting economic activity and legal retirement age (LRA) in the Kyrgyz Republic in the 21st century



Labor migration also creates additional problems, since social contributions from the migrant's labor activity go directly to the relevant funds and the budget of the employer's country, while the work experience earned in the EAEU countries is taken into account when determining the rights to an old-age pension of citizens of the Kyrgyz Republic. Thus, the problem of assessing the demographic burden in the context of globalization and the intensification of international migration goes beyond the theoretical exercise in population statistics and becomes important in the framework of interstate relations.

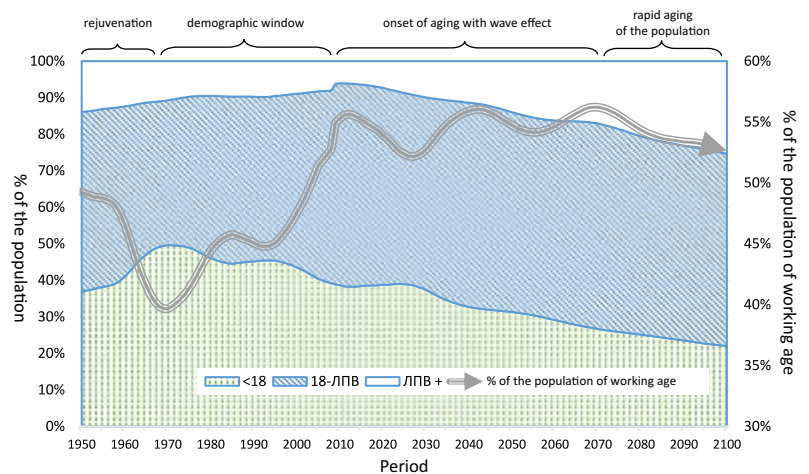
**The beginning of the population "senescence" and its consequences.**

Population growth during the demographic transition is inevitably associated with a change in the age structure of the population (in contrast to the growth of a stable population, which ensures a constant structure of the population by gender and age). The evolution of the age structure goes through certain stages: the rejuvenation of the population (an increase in the proportion of children and young people due to a decrease in mortality in childhood), the "demographic window" (an increase in the proportion of the population in working age, due to a decrease in the birth rate and a small number of people who lived to old age), and finally, the period of "aging" of the age structure in the conditions of stabilization of the population reproduction regime.

The stage of population rejuvenation in Kyrgyzstan ended in the 1970s. The "demographic window" for the development of the republic's economy remained open until the early 2010s. At this time, there was a simultaneous decrease in the proportion of children, adolescents and elderly (retired) people. Since the mid-2010s, the population of the republic has entered the initial phase of aging of the population, which, all other things being equal, will last about 50 years. During this period, the proportion of the elderly will increase at the same rate, and the proportion of children and adolescents will decrease.

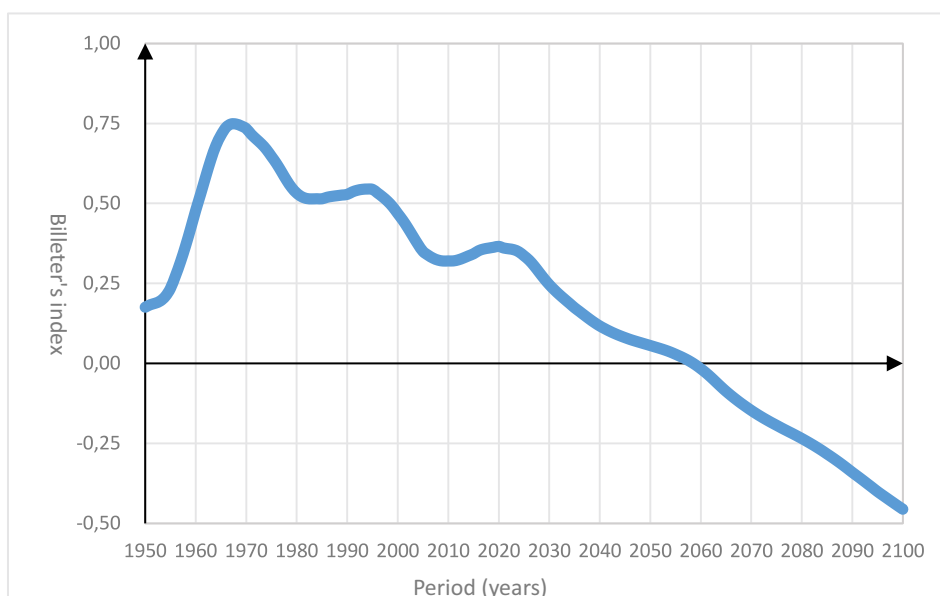
**Graph 20:** Dynamics of the ratio of the main age groups of the population of the Kyrgyz Republic during the demographic transition from 1950 to 2020 and the prospects until 2100 according to the UN forecast (the 2019 revision, medium version).

By the end of the 2050s, the population of Kyrgyzstan will enter a state of demographic old age, which means that the population older than reproductive age becomes larger than the population younger than reproductive age, that is, the top of the demographic pyramid becomes wider than its base. To measure the demographic age of the population, the so-called Billeter index is used, which is the difference between the population under 15 and over 49 years old, referred to the population at reproductive age (15-49 years old)<sup>3</sup>.



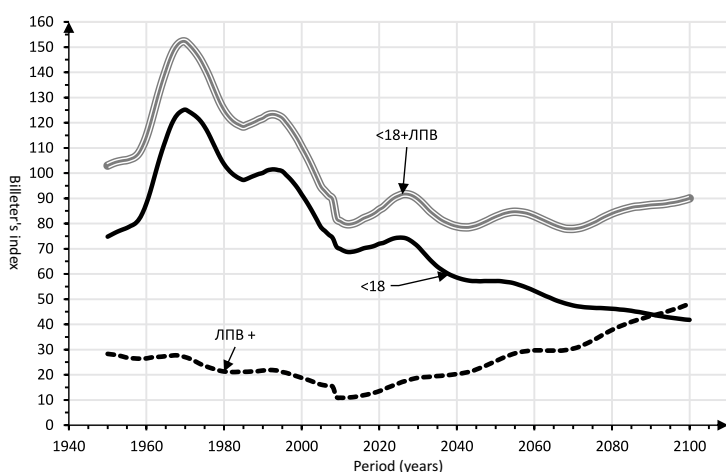
<sup>3</sup> Ernst P. Billeter "Eine Masszahl zur Beurteilung der Altersverteilung einer Bevölkerung", Swiss Journal of Economics and Statistics (SJES), 1954, vol. 90, issue IV, 496-505

**Graph 21:** Dynamics of the Billeter's index in the Kyrgyz Republic from 1950 to 2020 and the outlook until 2100 according to the UN forecast (the 2019 revision, medium version).



Although the overall demographic burden on the working-age population in the Kyrgyz Republic will remain more or less stable in the near future, its structure will change due to the inevitable aging of the population. If we take into account that currently in the Kyrgyz Republic, secondary education is completed, as a rule, at the age of 17, and the right to receive an old – age pension is currently received by men at the age of 63, and women at the age of 58, then in 2020, out of 100 people of non-working age, 85% were children, adolescents and young people under the age of 18, and pensioners only 15%<sup>4</sup>. In the future, the share of pensioners among the population of non-working age will steadily grow, and the share of young people will steadily decrease. Given the current trends in demographic dynamics, it should be expected that in the last decade of the 21st century, the share of pensioners in the Kyrgyz Republic would exceed the share of preschoolers and schoolchildren among the population.

**Graph 22:** Dynamics of the demographic burden taking into account changes in the legal retirement age (LRA) in the Kyrgyz Republic (from 2020 to 2100 according to the medium version of the UN forecast of the 2019 revision).



**Dynamics of the number of socio-demographic groups**

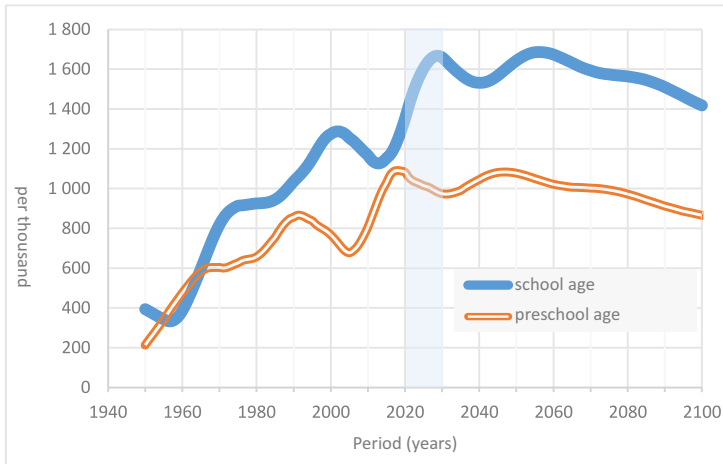
Structural changes in the consuming and producing population in the Kyrgyz Republic will be accompanied by noticeable changes in the number of contingents with specific needs. Thus, the number of school-age population in the next decade will inevitably and noticeably increase – from 1.35 million in 2020 to 1.67 million in 2029, which will obviously lead to an increase in the burden on the system of general compulsory education, will require additional costs for school infrastructure, an increase in the number of teaching and support staff. After 2030, the school

<sup>4</sup> The retirement age of 63 years for men and 58 years for women was set starting from January 1, 2007 in accordance with the law of the Kyrgyz Republic of July 21, 1997 No. 57, which provided, starting in 1999, a progressive increase in the retirement age. Before 1999 the retirement age was 60 for men and 55 for women. In addition, the pension legislation of the Kyrgyz Republic establishes a preferential retirement age for a number of categories of citizens, including those who lived and worked in the highlands (55 years for men and 50 years for women). The list of settlements in the highlands approved by the Government of the Kyrgyz Republic includes 75 settlements, including 12 settlements in the Jalal-Abad region, 51 settlements in the Issyk-Kul region and 12 settlements in the Naryn region



population will remain more or less stable at the level of 1.5-1.6 million until the beginning of 2070, after which it is expected to decrease if the birth rate in the Kyrgyz Republic follows the scenario of the average version of the UN forecast. On the contrary, the pre-school age population is likely to decline before the end of the current decade, which may lead to an increase in the economic activity of women in working age.

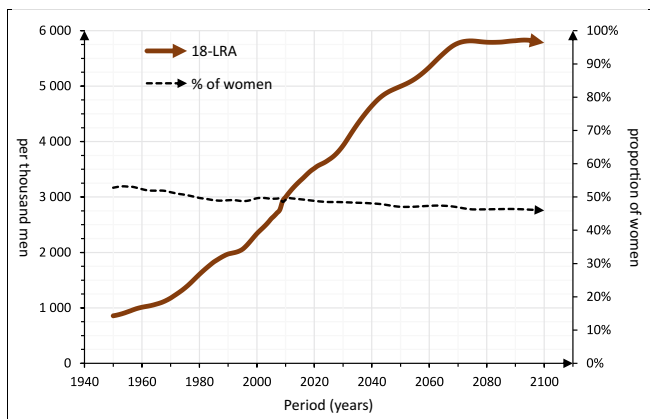
**Graph 23:** Historical and expected dynamics of the contingents of school and preschool age in the Kyrgyz Republic (from 2020 to 2100 according to the average version of the UN forecast of the 2019 revision).



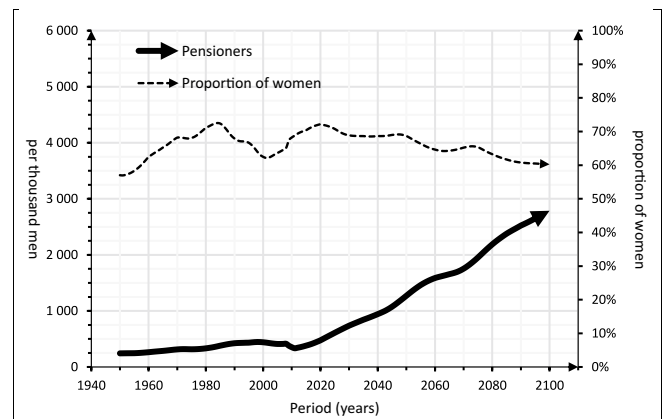
If in the medium and long term, the dynamics of the number of contingents of preschool and school age largely depends on the prospects for fertility, then the dynamics of the population in working and retirement ages is quite rigidly programmed for the next 20 years. Over the next two decades, the number of men aged 18 to 63 and women aged 19 to 58 will grow by about 1.1 million, that is, more than 30% compared to 2020. Over the same period, the population over the retirement age will almost double, reaching one million people.

**Graph 24:** Historical and expected dynamics of the population at working and retirement ages in the Kyrgyz Republic (from 2020 to 2100, estimated according to the average version of the 2019 revision of the UN forecast).

a) population aged 18 to legal retirement age



b) population over the legal general retirement age



The rapid growth in the number of pensioners, if it is not balanced by the growth of production and the wage fund, contains the threat of social default (lack of funds in the state budget and social security funds for the payment of retirement pension), uncontrolled inflation and impoverishment of the population.

For the Kyrgyz Republic, the accelerated growth in the number of pensioners is a completely new historical phenomenon. While the increase in social needs associated with an increase in the number of school students can be largely amortized by existing infrastructure and human resources, there is no such "safety cushion" for pension provision and the specific needs of the elderly population. At the same time, it should be borne in mind that such

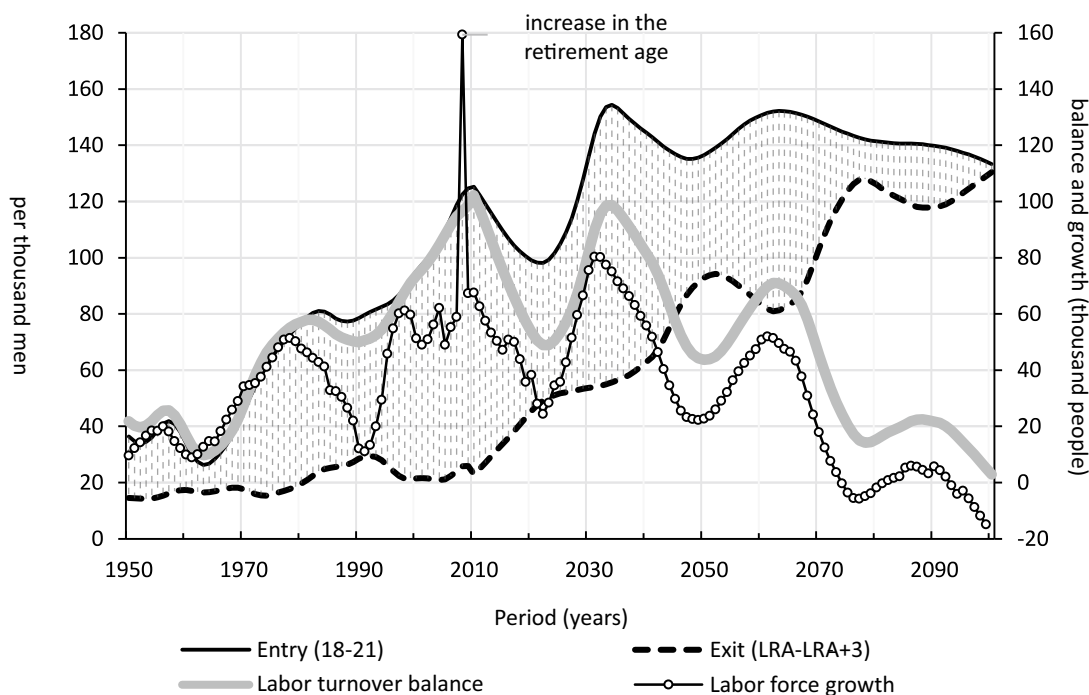
measures to reduce the demographic pressure on pension funds as increasing the retirement age or increasing the length of service are palliatives that give only a conjunctural effect. Filling and effective functioning of pension funds in the conditions of rapid growth in the number of pensioners is possible only due to the accelerated growth of the national economy.

**Population growth at working age: what are the implications for the labor market?**

An increase in the working-age population opens up additional opportunities for increasing production and improving living conditions in general only if the national labor market provides an appropriate demand for labor. Otherwise, the growth of the working-age population will lead to an increase in the number of unemployed, a slowdown in technological progress, a decrease in consumption, an increase in poverty, inequality and social tension in society.

In quantitative terms, the need to create new jobs is the balance of labor turnover in the labor market, that is, the difference between the number of young people entering the labor market, and the number of those who leave the market after reaching retirement age.

**Graph 25:** Historical dynamics and prospects of demographic turnover in the labor market in the Kyrgyz Republic (after 2020, according to the middle version of the UN forecast, the 2019 revision)



To calculate the balance of turnover, the arithmetic mean of the population of four one-year age groups was taken as the size of the contingent entering the market (18, 19, 20 and 21), and for the size of the leaving contingent, the arithmetic mean of the population of the initial retirement age and two subsequent one-year ages was taken.

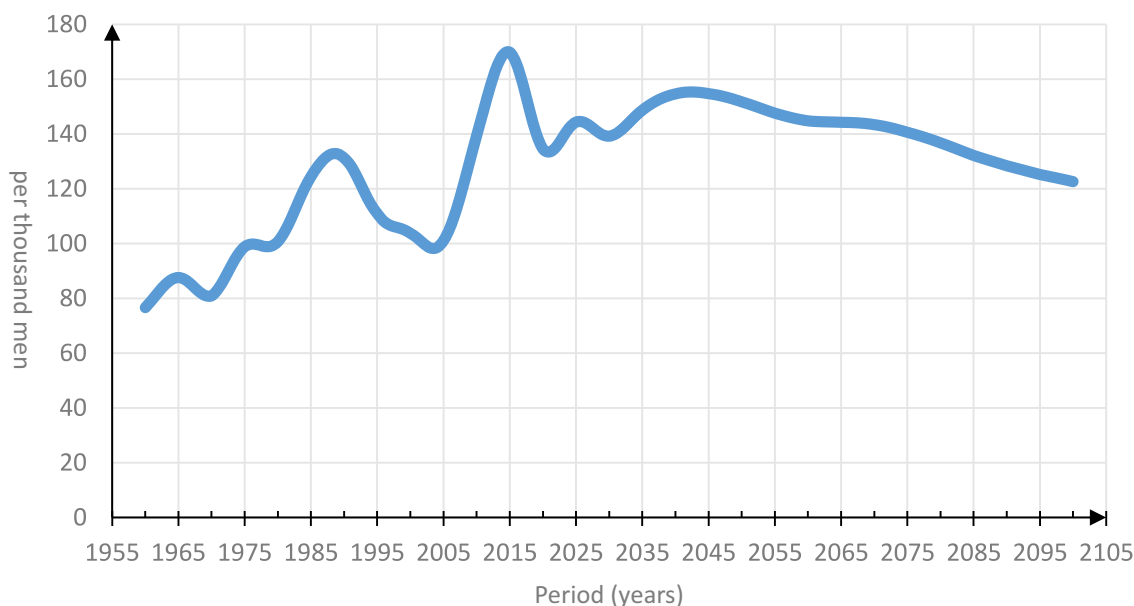
If we assume that the average and median age of the beginning of economic activity are close to each other, and that the same assumption is true for the age of termination of economic activity in old age, then to estimate the number of contingents entering and leaving the labor market, we can approximately estimate the size of the balance of demographic turnover of the labor force, which in the Kyrgyz Republic, as a rule, is significantly higher than the size of the population growth in working age, determined by formal criteria (the permitted age for employment, the age of completion of secondary school, the age of retirement in old age). This difference is because the achievement of these critical ages does not automatically mean inclusion or exclusion from the economically active population. So in the last five years, the average annual balance of the demographic turnover of the labor force was about 20 thousand more than the average annual increase in the number of the labor force (from 18 years to the legal retirement age). In 2020, the balance was 53 thousand, while the increase in the number of workers according to formal criteria was only 38 thousand.

In the next decade, we should expect an almost twofold increase in the need for new jobs, which will be caused by the entry into the labor market of numerous generations born in 2000-2010. The number of people who leave the labor market by age will also increase, but to a lesser extent than the number of young people who start working. The maximum value of the need to create new jobs will reach in the early 2030s, when the balance of the demographic turnover of the labor force will approach the mark of 100 thousand. This is probably the most serious challenge for the economic and social policy of the Kyrgyz Republic for the next decade. It is important to note that solving the problem of effective youth employment, if not automatically, will in many ways allow us to adequately respond to the second most serious challenge – the growth of the population in retirement age.

### **Elderly population.**

One of the most serious social problems caused by demographic aging is the growth of the population in old age and those who are unable to independently provide for their daily activities (shopping, cooking, hygiene procedures, maintaining order in their homes, etc.).

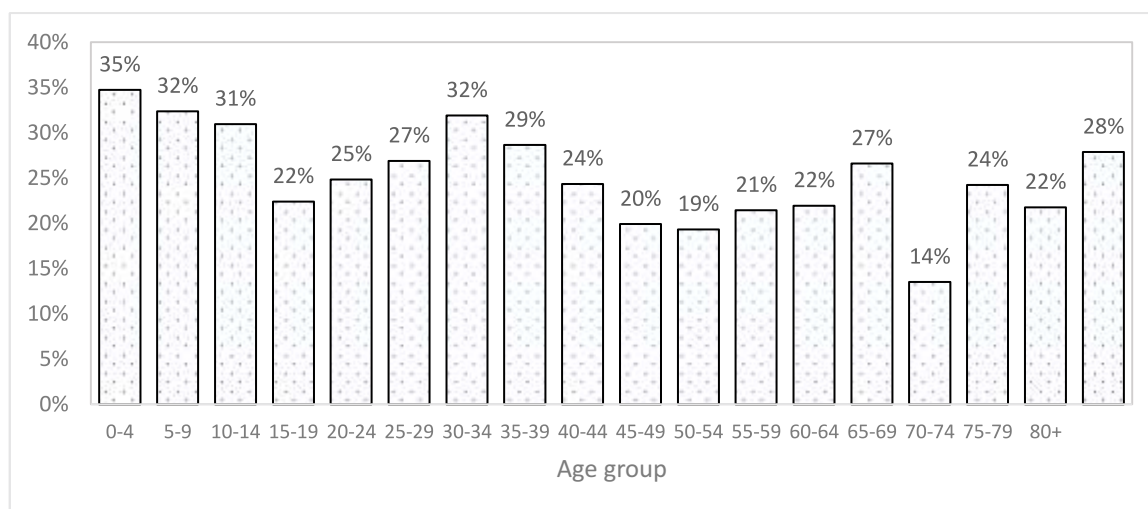
**Graph 26:** Historical Dynamics and Prospects for the Dynamics of the Population Aged 80 and over in the Kyrgyz Republic (after 2020 - according to the average version of the UN forecast, the 2019 revision)



The number of elderly people over the age of 80 in the Kyrgyz Republic reached its maximum in 2015, when this age group was supplemented by a large generation born in the mid-1930s. A new but less significant increase in this age group should be expected between 2020 and 2040. The approximate estimate of the number of "deep" old people in the near future is about 150 thousand people.

The problems of older people are compounded by the fact that they are increasingly living not only separately, but also far from their children and grandchildren and are deprived of the help and supervision of their closest relatives. According to the data of the sample survey of living standards in 2018, in the Kyrgyz Republic, only 3% of people over the age of 80 were single, and another 11% lived in households consisting of two people. However, even if adult children live together with their elderly parents, then with all the love and respect their (children) most often do not have enough time and do not have the necessary competence and skills to care for the elderly. In addition, according to the data of the study of living standards, the so - called "sandwich generation" effect is sufficiently noticeable in the Kyrgyz Republic - these are people aged 30 to 40 years who, on the one hand, bear the burden caused by the presence of preschool and school-age children in the family, and on the other hand, provide support to their elderly parents (including cohabitation).

**Graph 27:** proportion of people living below the poverty line by age in the Kyrgyz Republic according to the 2018 survey (whole age group = 100%, data weighted by the variable "total weight for the population")



Professional assistance to the elderly requires significant costs, which can be borne to some extent both by the pensioners themselves, if their income allows it, and by state and public funds through the system of benefits and fiscal benefits. The choice of priorities and the search for optimal methods of social protection of the elderly require special research, but, unfortunately, the problem of the needs and living conditions of elderly people in the Kyrgyz Republic remains poorly understood. At the same time, there are developed methods of mass surveys, such as The Survey of Health, Aging and Old-age Pensions in Europe, which, unfortunately, have not yet found application outside the European Union<sup>5</sup>. Research on the living conditions of older people aims to obtain detailed information about their income and well-being, their health status, the medical and sanitary care they receive and need, their social environment, and their participation in the workforce. The information collected makes it possible to orient social policies to help and protect older people from all kinds of discrimination, as well as to create a favorable environment for active aging.

The analysis of the current dynamics and prospects of the population movement in the Kyrgyz Republic shows the presence of a complex of interrelated problems and challenges caused by the rapid growth and changes in the age structure of the population, the key among which are the mass departure of the active population, primarily young people, abroad for work (labor migration), the growth of the population of retirement age and the concentration of the population around the two largest urban agglomerations of the republic, the cities of Bishkek and Osh.

Solving these problems requires a systematic approach and political decision - making. First of all, a large-scale assessment of the impact of labor migration on the national economy, on the level of well-being of the population, on the formation of the state budget and on the quality of the republic's labor resources is necessary. To do this, it is necessary to develop and improve the system of monitoring external and internal migration flows, to conduct special sample surveys, including in the framework of the general population census. It is especially important to develop a strategy and tactics for the harmonization of the economy of national institutions of social support (education, health and pensions) and the economy of international labor migration within the framework of the EAEU and bilateral interstate relations on the legal regulation of the use of foreign labor.

The inevitable growth of the population in old age primarily poses the problem of the state's monetary support for the payment of pensions, the total amount of which, all other things being equal, will grow in proportion to the increase in the number of persons who have reached retirement age. But if over the next 10 years the number of the population at the retirement age in the Kyrgyz Republic will increase by about 40%, then the number of the population aged from 20 years inclusive to the legal retirement age will increase by only 5%. Taking into account the difference in the reference base (the number of relevant contingents), this means that if today in the republic 1 som of pension payments accounts for 10 som of wages, then in ten years, all other things being equal, this ratio will already be 1 to 6. The problem is compounded by the fact that the number of people employed in the national economy of the republic is much smaller than the population of working age (from 20 to the legal retirement age), and the number of pensioners, taking into account preferential categories, is almost in the same proportion greater

<sup>5</sup> additional information is available at <http://www.share-project.org>

than the population that has reached the legal retirement age. According to the National Statistical Committee, in 2018, the number of people employed in the country's economy was 28% less than men aged 20-62 and women aged 20-57 (2.38 million vs. 3.31 million), and the number of pensioners is 39% more than people of retirement age (499 thousand vs. 695 thousand). In this situation, it can be assumed that if the reduction in the outflow of labor resources from the republic was achieved by creating new jobs in the national economy, this could not only provide additional resources for replenishing the pension fund, but also create conditions for the growth of household incomes, and therefore for increasing consumption and economic growth in general.

The concentration of the population in the urban agglomerations of Bishkek, Osh and Jalal-Abad undoubtedly creates a tension in the ecological situation and a threat to a decrease in agricultural land area. But at the same time an increase in demand for housing opens up ample opportunities for the implementation of urbanization programs and infrastructure projects, which in turn will contribute to the creation of new jobs, drainage of the urban environment and, ultimately, increase in the living standard of the population.

### ***Fertility, reproductive health, mortality and life expectancy.***

Beyond demographic challenges, answer to which requires the adoption of innovative systemic decisions in relation to the national development strategy, there are a number of other problems with a demographic dimension in the Kyrgyz Republic, for the solution of which there is already both the necessary material and institutional basis and staffing. In a point of fact, the peculiarities of fertility and mortality largely determine the national characteristics of the set of sustainable development goals for the millennium, grouped under «Good health and wellbeing for all», «Quality education», «Reducing inequality» and «Gender equality» headings, achieved through the country's existing public health and education systems. In this case, it must be understood that if the specificity of fertility and reproductive behavior, in the grand



scheme of things, constitutes the basic background and conditions for setting goals and defining the content of an action program aimed at protecting the health of women and children, then the specificity of mortality (level, structure) and life expectancy speak more about the effectiveness of measures taken to achieve this group of sustainable development goals. Consequently, to assess progress in the health and well-being for all used indicators such as infant, child and maternal mortality, the availability of qualified obstetrics, the availability of contraceptive methods, which in turn depend on the birth rate, prevalence of early marriages and early births, birth spacing and availability of prenatal diagnosis.

The concentration of population in the urban agglomerations of Bishkek, Osh and Jalal-Abad certainly creates a tense environmental situation and the threat of reducing the area of agricultural land. But at the same time, the increase in demand for housing opens up wide opportunities for the implementation of urbanization programs and infrastructure projects, which in turn will contribute to the creation of new jobs, the sanitation of the urban environment and, ultimately, to improving the standard of living of the population.

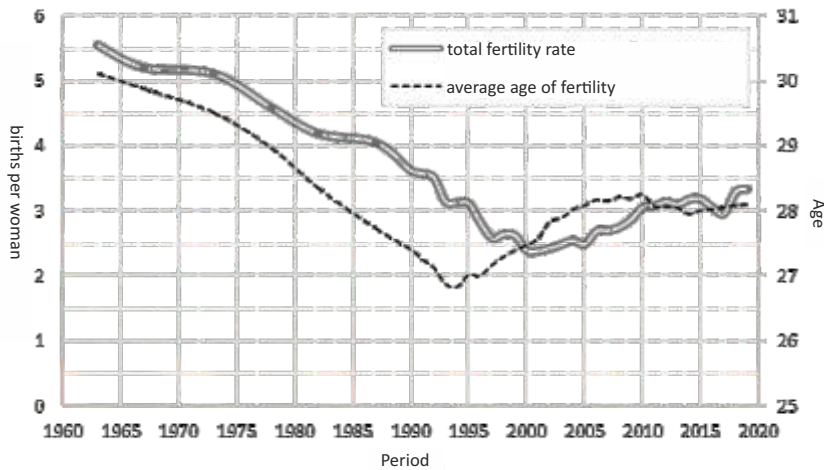
### ***Fertility, reproductive health, mortality, and life expectancy.***

In addition to demographic challenges, the response to which requires the adoption of innovative systemic solutions in relation to the national development strategy, there are a number of other demographic problems in the Kyrgyz Republic, for which there is already a necessary material and institutional framework, as well as personnel support. In particular, the characteristics of fertility and mortality largely determine the national characteristics of the set of sustainable development Goals for the Millennium, combined in the headings "Good health and well-being for all", "Quality education", "Reducing inequality" and "Gender equality", the achievement of which is ensured by the existing systems of public health and education in the country. At the same time, it should be borne in mind that if the specifics of fertility and reproductive behavior, in general, are the basic background and conditions for setting goals and determining the content of the action program aimed at protecting the health of women and children, then the specifics of mortality (level, structure) and life expectancy are more indicative of the effectiveness of measures taken to achieve this group of sustainable development Goals. For example, indicators such as infant, child and maternal mortality rates, availability of skilled birth care, availability of contraceptive methods are used to assess progress in ensuring health and well-being for all, which in turn depend on the birth rate, the prevalence of early marriages and early births, the intervals between births and the availability of prenatal diagnostics.

### Birth rate: stabilization at a high level

According to state statistics, over the past decade, the birth rate (the so-called total birth rate) in the Kyrgyz Republic has varied with small fluctuations around the value of 3.14 births per woman aged 15-49 years. The average birth rate also remained stable at 28 years. These parameters of the birth rate cannot be considered optimal for the republic, since if they are maintained and other conditions are equal, the population should double in 47-48 years.

**Graph 28:** Level (total fertility rate) and average age dynamics of fertility in the Kyrgyz Republic according to data from the state statistics.



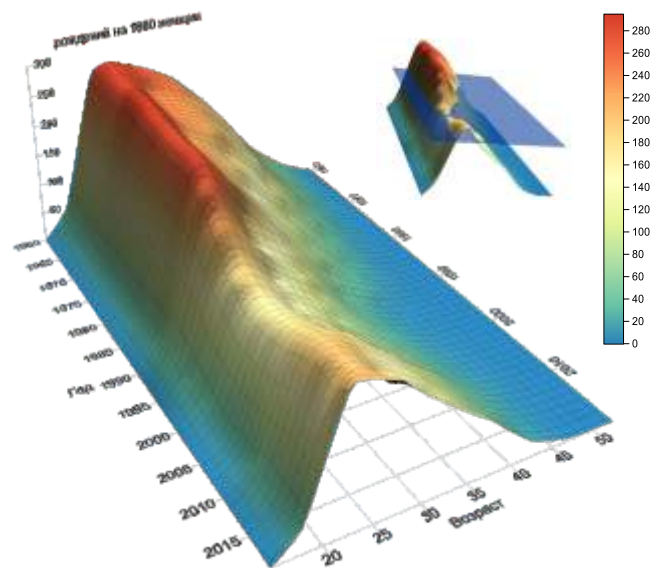
However, it cannot be excluded that the official estimate of the birth rate is an underestimate. Thus, the total birth rate, calculated according to the MICS -2018 data for a three-year period preceding the survey date was 3.9 births per woman aged 15-49, which reduces the period of doubling the population to 30 years.

### Birth rate depending on the age of a woman: the model of family formation as a whole does not change

Despite a slight decrease in the level and increase in the average age of birth, the model of family formation in the Kyrgyz Republic has changed very little over the past decades. Basically, the so-called "stop model" of family formation is preserved in the republic, when the birth of the desired children occurs immediately after marriage and at short intervals. The level of education plays a discriminating role here. Women who focus on secondary education marry at the age of 18-19, that is, at the end of school, and immediately have children. Women who are focused on higher education get married at the end of university or in the last year, and immediately after that begin to give birth to children. According to MICS -18, 41% of women aged 25-29 had a higher education, compared to 38% of women aged 30-34 and 31% of women aged 35-39. In the two older age groups, this proportion is only 23% and 17%.

**Graph 29:** Change in age-specific fertility rates in the Kyrgyz Republic from 1960 to 2019 \*

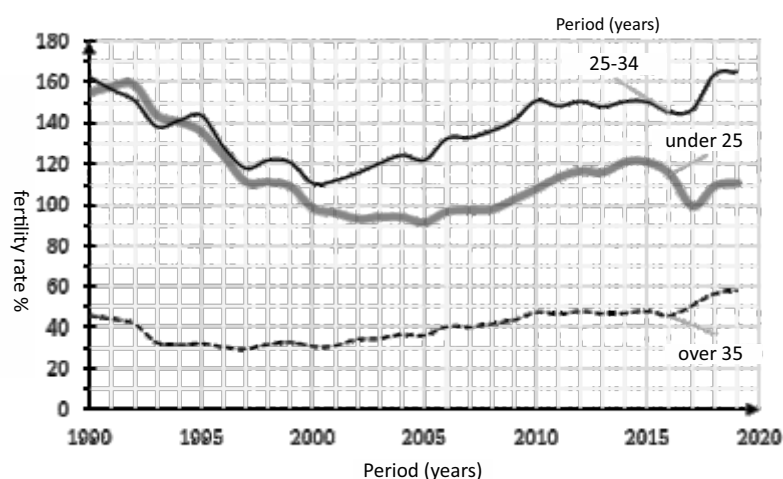
The growth of the educational level of women in the Kyrgyz Republic is indicated by the increase in the share of those who have received higher education among those who have secondary education. According to MICS-18, among women 20-24 years old, there were 53% and among women 25-29 years old – 54%. In older generations, this proportion decreases markedly. Among women aged 35-39 who have received secondary education, only 44% have a university degree, and only 26% of those aged 45-49 have one. The increase in the duration of training is undoubtedly reflected in the birth rate, which is increasingly moving towards older ages. Thus, the birth rate of women in the middle age, 25-34 years, increased by about 1.5 times, that is, to the same extent as the birth rate of women younger than 25 years



\* - the subspace in the inset corresponds to the minimum birth rate in 1994-1995

decreased. Particular attention should be paid to the increase in the birth rate among women over the age of 35, which has returned to the 1990 level, having almost doubled compared to the minimum values of the mid-1990s.

**Graph 30:** Fertility dynamics by enlarged age groups of women in the Kyrgyz Republic from 1990 to 2019



As you know, childbirth over the age of 35 is associated with an increased risk to the health of both the mother, due to the accumulation of various diseases and dysfunctions, and the newborn, due to an increase in the frequency of various chromosomal abnormalities. There is also an increased risk of multiple pregnancies, complications during pregnancy (placental abruption) and childbirth (the need for a caesarean section). Therefore, the increase in the birth rate in older women is becoming a serious challenge, for an adequate response

to which the development of a system of prenatal genetic counseling is required. This poses problems for the system of maternal and child health protection not only of a financial, logistical and personnel nature, but also of an ethical nature (the obligation of medical and genetic counseling). In addition, late delivery can cause an increase in the prevalence of diabetes, hypertension and other diseases of the cardiovascular system<sup>6</sup>.

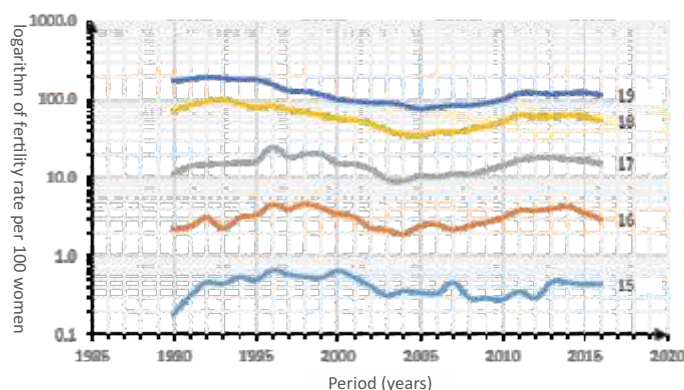
### Adolescent birth rate

The problem of adolescent fertility in the Kyrgyz Republic does not have the scale of a social phenomenon. The number of births per 1,000 women aged 15-19 is usually used as an indicator of the adolescent birth rate. This group is extremely heterogeneous in its social composition. It includes both girls at puberty (under 18 years of age) and physiologically adult women who have crossed the legal age of marriage (18 years since 2012 in accordance with article 14 of the Family Code of the Kyrgyz Republic), who have completed secondary general or secondary vocational education and have all civil rights, so this indicator should be interpreted with all caution.

Data from government statistics and sample studies show that births to girls under the age of 16 are extremely rare (in 2019, only 39 births were registered for 53 thousand girls aged 15). Births are also rare among girls aged 16 years (less than 3 per thousand). The number of births to girls at the age of 17, when marriage is already allowed in exceptional cases, in 2019 it was 14 per thousand. The majority, 90% of births registered in women under the age of 20, are among those aged 18 (30%) and 19 (60%).

**Graph 31:** Fertility among women under 20 years of age in the Kyrgyz Republic (natural logarithm of the number of births per thousand women of the corresponding age)

Data from sample studies, in particular MICS-18, also indicate an extremely low birth rate in adolescent girls under 18 years of age. Thus, in the urban population, there were no women who became mothers before the age of 16, in the rural population there were only two in a thousand and only among those who were 30 years old at the time of the survey (that is, the birth of children took place earlier than 2003). At the age of 17, only 1.9% of women surveyed in urban areas and 3% of those surveyed in rural areas gave birth to a child.



State statistics, as well as data from sample studies, indicate that at present in the Kyrgyz Republic the problem of teenage motherhood does not have the character of a mass social phenomenon.

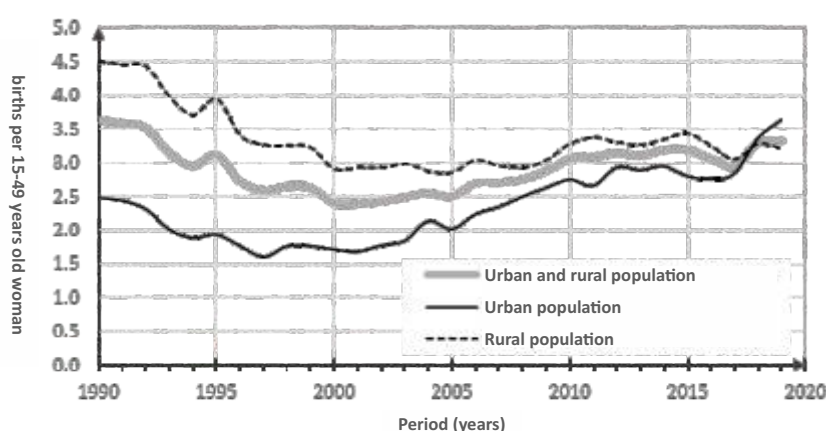
<sup>6</sup> Terence T. Lao, MD12, Lai-Fong Ho, MSC3, Ben C.P. Chan, and Wing-Cheong Leung, (2006) "Maternal Age and Prevalence of Gestational Diabetes Mellitus", *DiabetesCare*, <https://doi.org/10.2337/diacare.29.04.06.dc05-2568>; Adnan Qureshi, Omar Saeed, Ahmed Malik, Jan Degenhardt, Roland Ax-Flidner, and Thomas Kohl (2016) "Pregnancy in Advanced Age Increases the Risk of Hemorrhagic Stroke in Post-menopausal Women. Analysis of Women's Health Initiative Study", *Stroke* [https://www.ahajournals.org/doi/abs/10.1161/str.47.suppl\\_1.wmp50](https://www.ahajournals.org/doi/abs/10.1161/str.47.suppl_1.wmp50)

### Urban and rural fertility: a question of data quality

Official statistics published by the National Statistical Committee of the Republic show that the difference between the birth rate of the urban and rural population decreased between 1990 and 2000 because in rural areas the decline in the birth rate was greater than in urban settlements. After 2000, the reduction of differences continued, but this time due to the accelerated growth of the birth rate of the urban population. This rather unusual trend has led to the fact that since 2018, the birth rate in cities has become higher than in rural areas.

These estimates are contradicted by the results of MICS-2018, which say that in 2016-2018, there were 4.4 births in rural areas and 3.3 births in urban areas per woman aged 15-49<sup>7</sup>. At this level of fertility, the expected period of doubling of the rural population of the republic will be 26, and the urban population – about 45 years.

**Graph 32:** Dynamics of the level (total fertility rate) of the birth rate of the urban and rural population of the Kyrgyz Republic from 1990 to 2019 according to data from the state statistics.



It is obvious that the shift in the estimate of the birth rate will not only lead to an incorrect assessment of the territorial structure of the need for medical care in connection with pregnancy, childbirth and the postpartum period, the need for methods of preventing pregnancies and the number of preschool and school contingents, but also create a distorted picture of the territorial dynamics of the population of the republic as a whole.

It is difficult to say which estimate of the birth rate parameters is more consistent with the real state of affairs? In any case, the question of the quality of birth statistics requires special study. At the same time, the difference in estimates obtained from different sources does not affect the general conclusion that the current birth rate is not optimal from the point of view of the prospects for population growth in Kyrgyzstan, and the desired scenario for the republic would be an early reduction in the birth rate (total birth rate) to 2.0-2.1 births on average per woman 15-49 years.

### An idea of the ideal family size

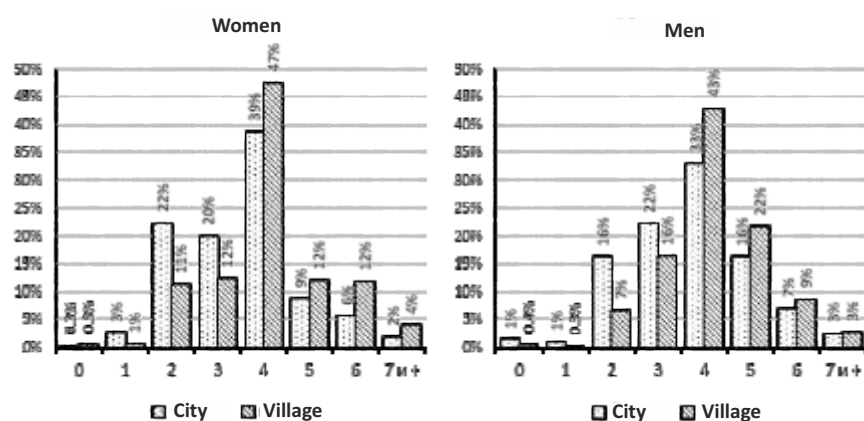
The question of the ideal number of children was asked in the course of a 2012 Demographic and Health Survey. Although these data may be considered outdated, it should be recognized that they accurately predicted the fertility prospects for the second half of the 2010s, showing that for an urban family the average ideal number of children is 3.6, and for a rural family 4.2. Men in the Kyrgyz Republic, as a rule, want to have slightly more children than women. In cities, the average ideal number of children for men is 3.8, while for women it is 3.5. In rural areas, the average number of children for men and women is almost the same: 4.21 and 4.15, respectively.



<sup>7</sup> Multiple Indicator Cluster Survey/ MICS 2018 report, Bishkek, Kyrgyz Republic 2019: National Statistical Committee of the Kyrgyz Republic, United Nations Children's Fund (UNICEF).



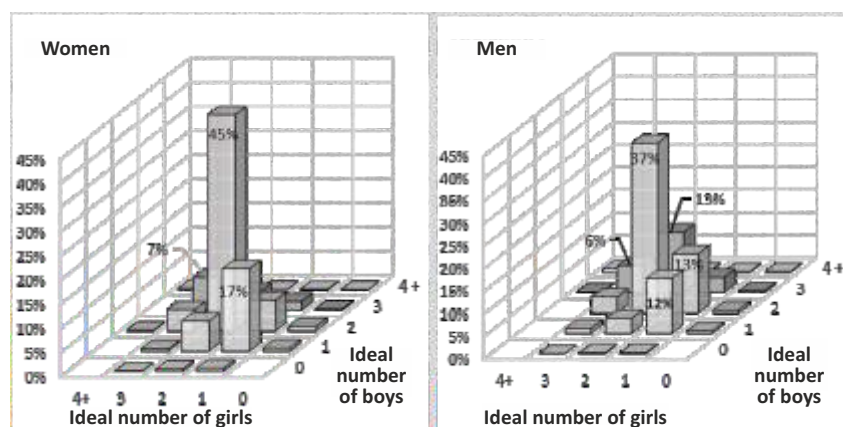
**Graph 33:** Representation of men and women in urban and rural populations about the ideal number of children in a family according to the 2012 DHS data



In both rural and urban areas, the ideal family for most men and women is a family with four children – two boys and two girls.

**Graph 34:** Representation of men and women about the ideal number of boys and girls in the family according to the 2012 DHS data

According to the DHS-2012 data, the Kyrgyz Republic does not yet face the threat of a "selective" birth rate in relation to the child's sex, which was observed in China, India, Vietnam, Azerbaijan and a number of other countries in Asia and Europe.



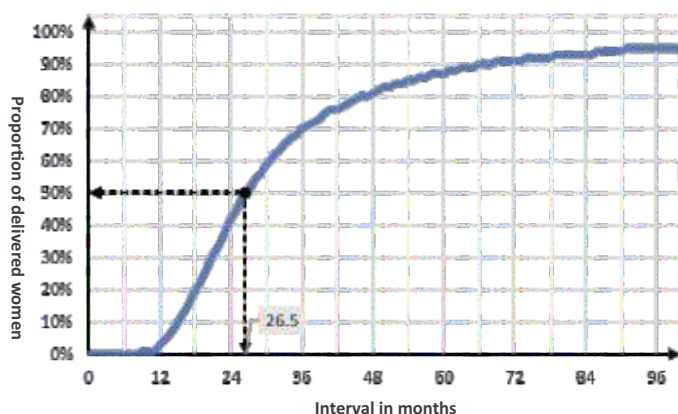
**The intervals between births are very short**

Too short, less than 36 months, intervals between births (the intergenetic interval) pose a threat not only to the physical health of the mother and child, but also to the quality of care and upbringing of children at an early age. The MICS -18 data show that too short intervals between births are very common in the Kyrgyz Republic. Especially short intervals separate the birth of the first child and the second child, that is, this problem affects most births and most women. Overall, for the entire population, the median interval between the birth of the first and second child is 26.5 months, with 40% of second births occurring less than 24 months after the first. The average interval between the first and second births is 27.5 months<sup>8</sup>.



<sup>8</sup> For this estimate, the standard survival model (life table method) was used.

**Graph 35:** The interval between the birth of the first and second child according to MICS -18



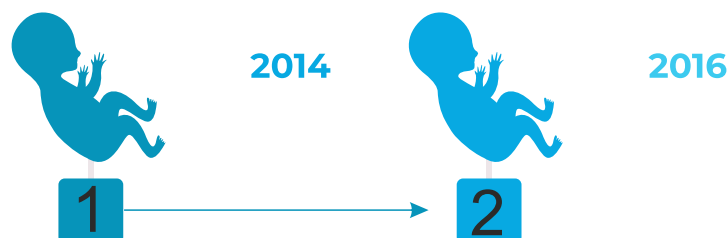
In cities, on average, the intervals between births are slightly longer than in rural areas. At the same time, in 25% of urban women (the first quartile of the distribution) who gave birth to a second child, this occurred less than 21 months after the birth of the first child, and for rural areas, the same indicator was 19 months. For the second quartile (median), the interval between the first and second births was approximately 29 months in the city and 26 months in the village<sup>9</sup>.

Between the birth of the second and third child, the interval is much longer than between the birth of the first and second. In both urban and rural areas, 25% of women who gave birth to a third child had it less than 25 months after the birth of a second child, and for 50% of women, this interval was less than 37 months in the city and 38 months in rural areas.

The same picture is given by the analysis of the intervals between the third and fourth births, the median value of which increases to 43 months, but for 25% of women this interval was less than 28 months in urban areas and less than 25 months in rural areas.

Thus, in both urban and rural areas, approximately 25% of second, third and fourth births are at increased risk due to the factor of too short interval between consecutive births. This problem requires more detailed study, but it is more or less obvious that this risk group consists of women who are focused on the "stop model" of family formation and who do not resort to pregnancy prevention methods to regulate the intervals between births or use ineffective methods of contraception.

Apparently, in this group, the main regulator of the intervals between births is breastfeeding. Although the question about the use of the method of "lactation amenorrhea" was not asked in the section on contraception, indirect assessment methods indicate that lactation amenorrhea on average is about 10-12 months. Therefore, according to MICS-18, the median duration of breastfeeding was 17 months<sup>10</sup>, which is according to John Bongaarts' formula  $i = 1,753 \cdot e^{0,1396 \cdot L - 0,001872 \cdot L^2}$  gives the duration of lactational amenorrhea 10.9 months. Approximately the same result, 11 months, gives the application of the formula proposed by Carlo Corsini  $1,5 + 0,56 \cdot L^{11}$ . This duration of lactation amenorrhea provides a minimum interval between births of approximately 24 months on average. A further increase in the interval can only be provided by the use of methods of preventing pregnancy with the help of contraception or artificial abortion. Unfortunately, the level of contraception use in the Kyrgyz Republic is low, and the prevalence of artificial abortion must be recognized as quite high.



<sup>9</sup> For the assessment, the Kaplan-Meier multiplicative estimation model was used for pregnancies lasting more than 6 months.

<sup>10</sup> MICS-18, Table TC 7.4 «Breastfeeding Duration»

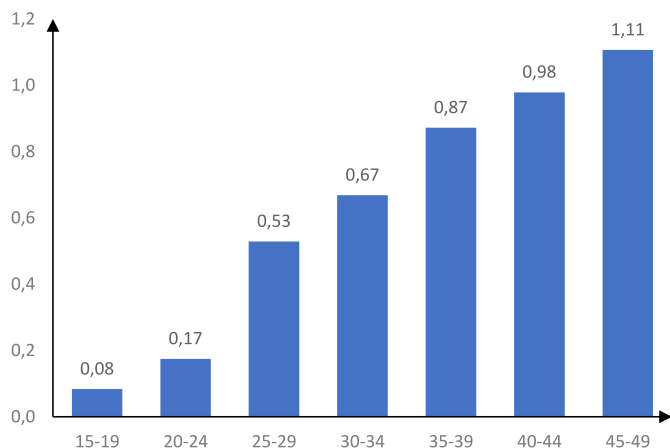
<sup>11</sup> Bongaarts, John (1978) "A Framework for Analyzing the Proximate Determinants of Fertility" Population and Development Review, Vol.4, no 1, (March 1978), p.105-138.

## Abortion and contraception

According to state statistics, over the past 10 years, the prevalence of abortions in Kyrgyzstan has fluctuated around 20 abortions per 1,000 women aged 15-49 years per year, of which about half are artificial abortions at the request of a woman (including mini-abortions), which roughly corresponds to the level or total abortion rate of about 0.2 artificial abortions per woman<sup>12</sup>. For all types of abortions, including spontaneous abortions, this figure will be twice as high, respectively. At the same time, the data of sample surveys suggest that in fact the prevalence of artificial abortion in the Kyrgyz Republic is much higher.

According to MICS-2018 data, one woman 15-49 years old had an average of 0.77 artificial abortions, and women 45-49 years old had an average number of abortions of 1.1, that is, 4-5 times higher than the indicators calculated according to state statistics.

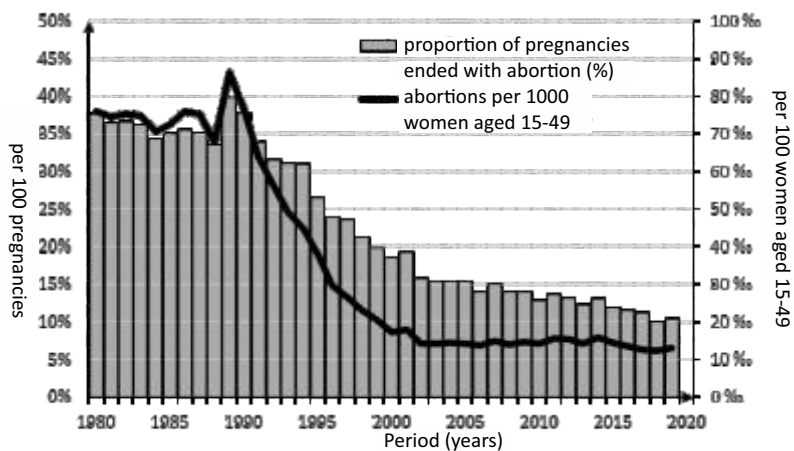
**Graph 36:** Average number of abortions per woman by age group according to MICS-18 data



The increased risk is observed at the age of 25-29 years, when the rate of abortions increases more than 3 times compared to the age of 20-24 years. The second critical age of increasing the rate of abortions is 35-39 years, when the risk of abortions increases by 1.3 times compared to the age of 25-29 years. In all likelihood, these jumps in the level of abortions are due to the "stop model" of family formation: at 25-29 years, the formation of families with two children is completed, at 35-39 years, the formation of families with 4 children is completed.

Thus, in the Kyrgyz Republic, artificial abortion is widely used for birth control and family size regulation. The fact that in recent years there has been a decrease in the share of abortions in the total number of known pregnancies in the republic may be explained by a change in the age structure of women of reproductive age, namely, a decrease in the share of women aged 25-29. In other words, the dynamics of this indicator does not give grounds for optimism about the prevalence of abortions.

**Graph 37:** Prevalence of induced abortion in the Kyrgyz Republic according to state statistics data.



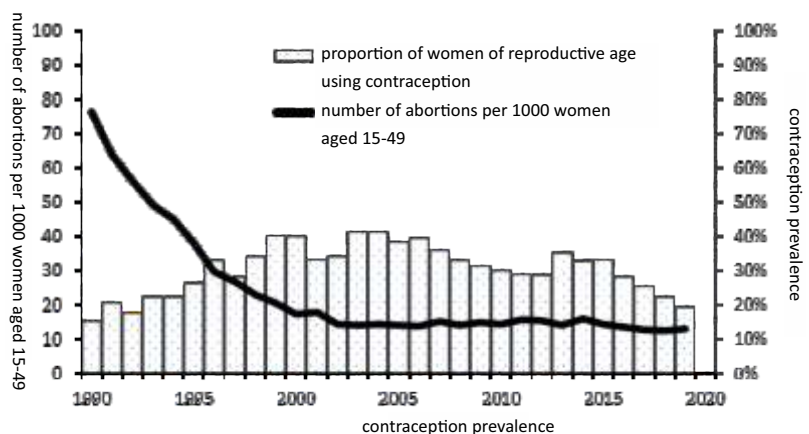
It is also a matter of concern that over the past 5 years, the share of mini-abortions in the structure of artificial abortions has decreased (from 60 to 40% between 2015 and 2020), and, on the contrary, the number and share of artificial abortions at late legal terms (from 30 to 46%) and so-called abortions for social reasons (from 8 to 15%).

<sup>12</sup> The total abortion rate is calculated as the sum of the products of the age-specific abortion rates by the amplitude of the age intervals for which these age-specific coefficients were calculated. This indicator is interpreted by analogy with the total fertility rate, as the number of abortions, which, on average, will be recorded in the history of a woman's pregnancies by the end of reproductive age at the given age rates.

According to government statistics published by the National Statistics Committee, the proportion of women of reproductive age using contraception, or the prevalence of contraception, decreased by about half (from 40% to 20%) between 2002 and 2019<sup>13</sup>.

The decrease in the prevalence of contraception according to current accounting data may be the result of the rejection of the use of modern means (hormonal contraception, IUD, sterilization for contraceptive purposes) in favor of traditional (interrupted sexual intercourse) or barrier means that are freely available (male condom). Indeed, between 2000 and 2016, according to official data, the prevalence of IUDs decreased three times, from 22 to 7%, the prevalence of hormone pills has not changed much, remaining at the level of 7-8%.

**Graph 38:** Prevalence of contraception and induced abortion according to current records.



For obvious reasons, official statistics on the use of contraception are incomplete, since they can only take into account women who are registered and registered in connection with the use of "instrumental" methods of pregnancy prevention prescribed or established by a medical professional. Contraception prescribed and distributed in private medical practice may also elude official registration. In addition, the indicator that is used in official publications is the ratio of the number of women using contraception

to the number of all women of reproductive age, whereas in international practice it is customary to estimate the prevalence of contraception as the ratio of the number of women using a method of preventing pregnancy to the number of women who are in a registered or unregistered marriage. Therefore, the indicators published by the National Statistical Committee underestimate the prevalence of contraception by a multiple of the proportion of married women aged 15-49, which is about 70%.

Data from sample surveys provide a more complete picture of the prevalence of contraception, since they take into account not only instrumental (contraceptive medications, intrauterine devices, condoms), but also other methods of contraception (interruption of sexual intercourse and periodic abstinence). Thus, according to MICS -18 data, 39.4% of women aged 15-49 used some method of contraception, of which more than half (23.5%) used methods that can be taken into account in official statistics<sup>14</sup>. This level of prevalence of contraception is almost two times less than the optimal one. Given the current birth rate in the Kyrgyz Republic and to minimize the rate of abortions, about 70% of women aged 15-49 years should use contraception.

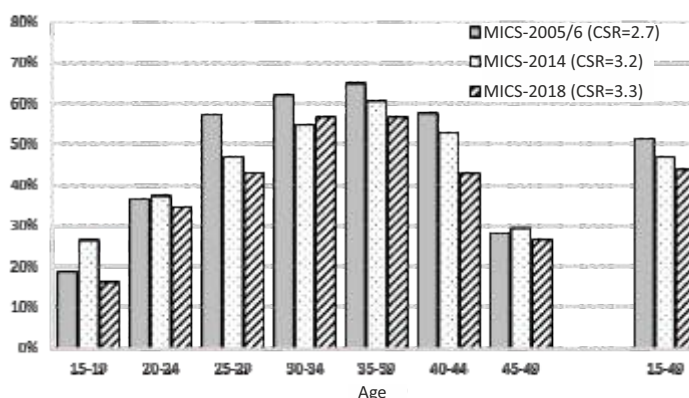
A comparison of data from three consecutive multi-indicator surveys conducted in 2005-2006, 2014, and 2018 shows a marked decrease in the prevalence of contraception among women of all ages, except for the age of 30-34, where the frequency of contraception use increased slightly between 2014 and 2018, from 55% to 57%. The frequency of contraception use among women aged 25-29 years and women aged over 40 years decreased the most. If the decrease in the prevalence of contraception among women aged 20-25 can be explained by an increase in the birth rate, then the question of the reasons for the decrease in interest in contraception in older women requires a special study.

<sup>13</sup> Women and men in the Kyrgyz Republic. 2015-2019, Statistical abstract. National Statistical Committee of the Kyrgyz Republic. Table 6.15,

<sup>14</sup> Data and indicators on contraceptive use are taken directly from the standard report 2018 Multiple Indicator Cluster Survey. Survey Report. Bishkek, Kyrgyz Republic 2019: National Statistical Committee of the Kyrgyz Republic, United Nations Children's Fund (UNICEF). Section 6.3 "Contraception"

**Graph 39:** Proportion of women in registered or unregistered marriages and using contraception, according to multi-indicator comprehensive sample studies.

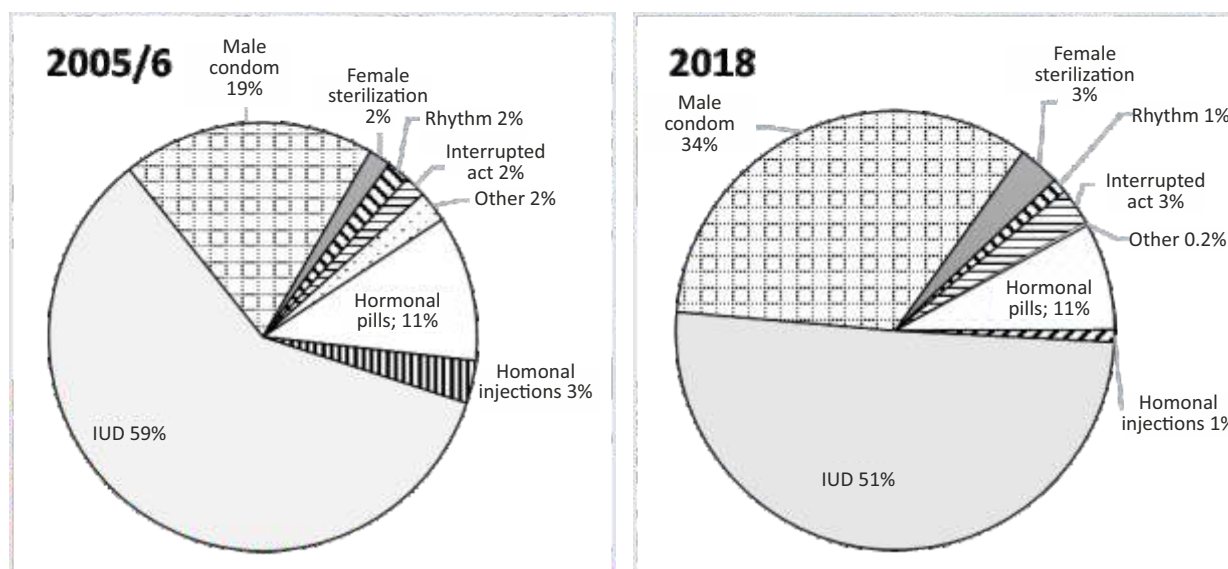
Almost all women of reproductive age (99.7%) said that they know about contraception, and the majority of women know about modern methods, while only 79.2% of women know about "traditional" methods (interrupted sexual intercourse and periodic abstinence). The most well-known methods are the IUD, which is known to 92% of all women and 98% of women who are married or in a union, and the male condom (94% of all women and 98% of those who are married). Hormone pills are also well known, and 90% of all women and 94% of women who are married know about them. At the same time, only 25% of women know about hormone implants and three-quarters of women know about hormone injections. On average, a woman of reproductive age knows about 6-7 different methods of contraception.



Knowledge of contraceptive methods clearly correlates with the structure of contraception used, where IUDs are dominant, which are used by half (51%) of those who use contraception. Another 34% of the structure of contraception used is the male condom. In third place are hormone pills, which are used by only 8% of women who use contraception.

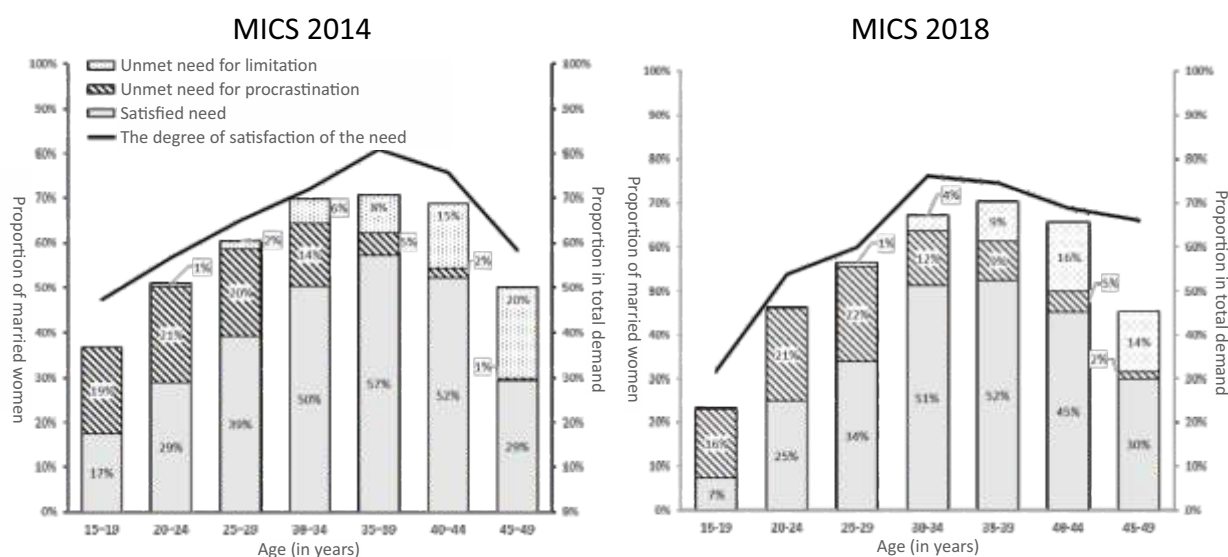
A comparison of data from three consecutive sample comprehensive surveys for many indicators suggests that, along with a decrease in prevalence, there is also a noticeable change in the structure of contraception used. Between 2005 and 2018, the share of IUDs in the contraception structure decreased from 59 to 51%, and the share of hormone pills – from 11 to 8%. Significantly, the share of injections decreased from 3 to 1%, and the share of the male condom, on the contrary, increased by 1.75 times, from 19 to 34%.

**Graph 40a:** The structure of contraception used (all methods = 100%) in the Kyrgyz Republic according to the data of the comprehensive surveys (MICS) 2005-2006 and 2018.



Over the past 5 years, there have been no noticeable changes in the level and structure of the so-called unmet need for contraception in the Kyrgyz Republic. Women under the age of 30 still lack contraception to delay births, and older women still lack contraception to limit family size.

**Graph 40b:** The structure of the need for contraception in the Kyrgyz Republic according to the comprehensive surveys (MICS) of 2014 and 2018.



Moreover, in almost all ages, the ratio between satisfied and unmet need has deteriorated, with the only exceptions being the age of 35-39 years, where this ratio has hardly changed, and the age of 45-49 years, where this ratio has improved, but only due to a decrease in the overall need for contraception.

The structure and level of unmet need for contraception in the Kyrgyz Republic are clearly related to the family formation model. As already noted, the intervals between the birth of the first child and the second child on average do not exceed 27 months, which suggests that the most important factor determining the intergenetic interval is breastfeeding and lactation amenorrhea determined by it. In almost half of the cases, the next pregnancy occurs as soon as the breastfeeding period ends. At the same time, according to the study, a significant proportion of women under 30 years of age would like this pregnancy to occur later, that is, they have a need for contraception, which was not met. In all likelihood, this state of affairs is due not only and not so much to the unavailability of contraceptives, but also to the orientation of the population to use the IUD as the main and most effective method of preventing pregnancy. Since the installation of an IUD immediately after birth is impossible, and the use of hormonal pills remains unpopular and seems useless in the first months after pregnancy due to lactation amenorrhea, women often completely abandon the use of effective methods. One of the reasons for refusing effective contraception for a young mother may be the lack of time to go to the gynecologist.

One solution to the problem of unmet need for contraception to regulate the intervals between births can be the installation of a hormone implant immediately after delivery in a maternity hospital or other medical institution where the birth took place. On the one hand, the installation of the implant will help to increase the interval between births to 36 months, and on the other hand, it will become an important motive for periodic visits to the gynecologist to check the state of reproductive health. Of course, the focus on the wider use of modern implantable contraception will require a special program, including not only the purchase of appropriate drugs, but also the training of doctors and the introduction of a special prenatal monitoring protocol to determine the extent to which this or that woman can be recommended.

### **Mortality and life expectancy**

At present, it is quite difficult to accurately assess the mortality rate and the dynamics of life expectancy in the Kyrgyz Republic due to the unreliability or lack of baseline data on both the population and the number of deaths by gender, age and causes of death. Since in the inter-census period, data on the size and structure of the population is an estimate that is made on the basis of the balance equation, the further we move away from the date of the census, the less reliable the estimates become. Additional complications are brought by intensive external and internal migration, as well as the growing difference between the legal (permanent) and cash population.

### ***Accounting features and data quality problem***

As for data on the deceased by gender, age and causes of death, the spread of the practice of civil registration at the place of application obviously makes it difficult to assess not only the parameters of population movement (the balance of population movement), but also the structure of causes of death in the regional context. In addition, the National Statistical Committee of the Kyrgyz Republic refrains from publishing data on the number of deaths by sex, age and cause of death, which makes it impossible to analyze inequality in the face of death.

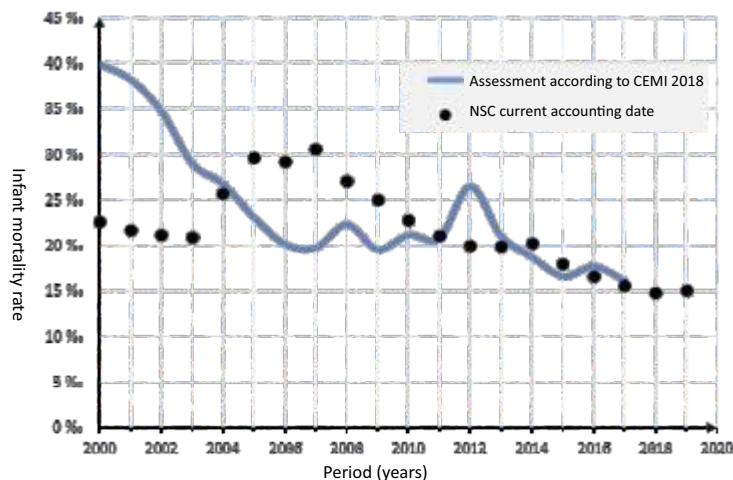
Only infant and maternal mortality data can be used directly and without much concern, since the number of births is used as the denominator for calculating the corresponding coefficients, that is, events (births and deaths) recorded during the same year are compared. Child mortality indicators (the mortality rate of children under the age of 5 and the probability of dying before the age of 5) can be treated with less confidence. In particular, it is a matter of concern that in the published demographic yearbooks of the National Statistical Committee of the Kyrgyz Republic, the sum of the mortality rates at the age of less than one year and at the age of 1-4 years exactly coincides with the mortality rate at the age of 0-5 years, which is practically impossible. In official documents, the algorithms for calculating these indicators are silent.

### ***Infant mortality is declining, but regional differences are too great***

Historically, the problem of assessing the infant mortality rate in Central Asian countries has been associated with incomplete registration of children who died at the age of less than one year. As the data of sample studies conducted in the republic since the end of the 1990s show, the accounting of child mortality has become more and more complete. The estimate of the infant mortality rate according to the MICS-2018 data for the last 5 years preceding the survey almost completely coincides with the indicators calculated on the basis of data on the current registration of births and deaths at the age of less than one year. Both sample studies and state statistics show that in recent years, a steady trend of reducing infant mortality has been formed in the republic. At the same time, the infant mortality rate remains quite high compared to the countries of Eastern Europe, where from 3 (Estonia) to 10 (Moldova) out of a thousand newborns die in the first year of life.



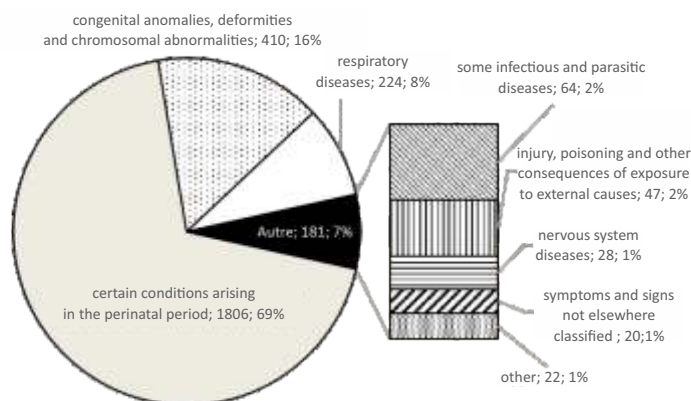
**Graph 41:** Estimated dynamics of infant mortality smoothed over three-year intervals (number of deaths under 1 year of age per 1000 live births) according to MICS -2018 and published annual indicators of national statistics of the Kyrgyz Republic.



Today, the level of medical care for pregnant women and women in labor in the republic can be considered satisfactory, because almost all births take place in maternity hospitals or other highly specialized medical institutions. Nevertheless, the potential reserves for reducing infant mortality are hidden precisely in improving prenatal medical care and counseling for pregnant women.

Currently, approximately 85% of deaths of children under the age of one year are caused by two classes of diseases according to the International Classification of Diseases of the 10th revision (ICD-10). These are Class XVI, which groups "individual conditions that occur in the perinatal period" and represent 69% of infant deaths, and Class XVII, which combines diseases and conditions caused by congenital anomalies (malformations), deformities and chromosomal disorders, which caused 16% of deaths in 2019.

**Graph 42:** The structure of the need for contraception in the Kyrgyz Republic according to the comprehensive surveys (MICS) of 2014 and 2018.



Demographic Yearbook of the Kyrgyz Republic, 2015-2019, table 4.3

Although official statistics do not provide a more detailed explanation of these two groups of causes of death, it is known that mortality from conditions that occur in the perinatal period is largely associated with the course of pregnancy against the background of concomitant diseases (diabetes, kidney, heart and vascular diseases, autoimmune diseases, etc.); in addition, risk factors are considered to be the age of a woman younger than 20 and older than 35 years. According to data for 2015 (the only year for which we were able to obtain form

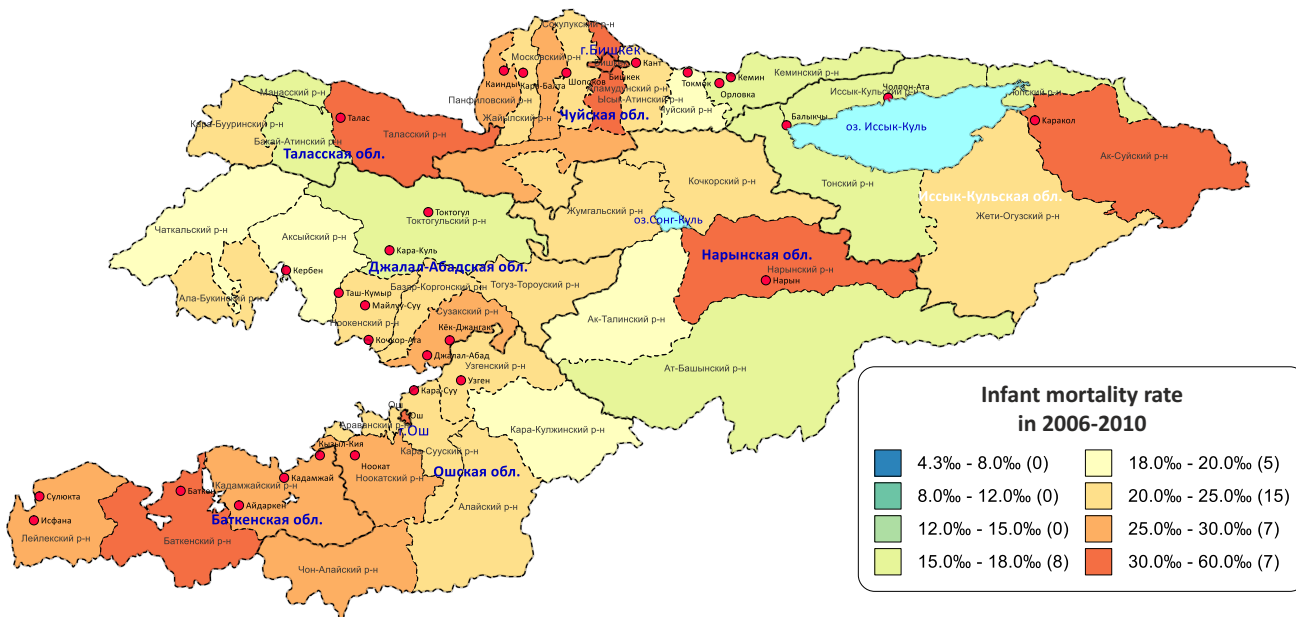
C51), in 40% of cases, the cause of death of children from individual causes occurring in the perinatal period was fetal or newborn damage caused by conditions of the mother that could not be related to the current pregnancy (ICD-10 codes P00). Among infants who died due to congenital anomalies, approximately 40% died due to congenital heart defects and cardiac septum. Another 20% of deaths from congenital malformations are due to abnormalities of the nervous system, where about half are due to congenital hydrocephalus, and 17% are associated with abnormalities of the digestive system. Almost all deaths from the two leading classes of causes (XVI and XVII according to ICD-10) occur during the neonatal period (during the first four weeks after birth). Thus, there is every reason to assume that the first condition for reducing infant and perinatal mortality in the Kyrgyz Republic should be the development of a system of early prenatal diagnosis, including genetic counseling, and medical monitoring of women's health throughout the entire period of pregnancy.



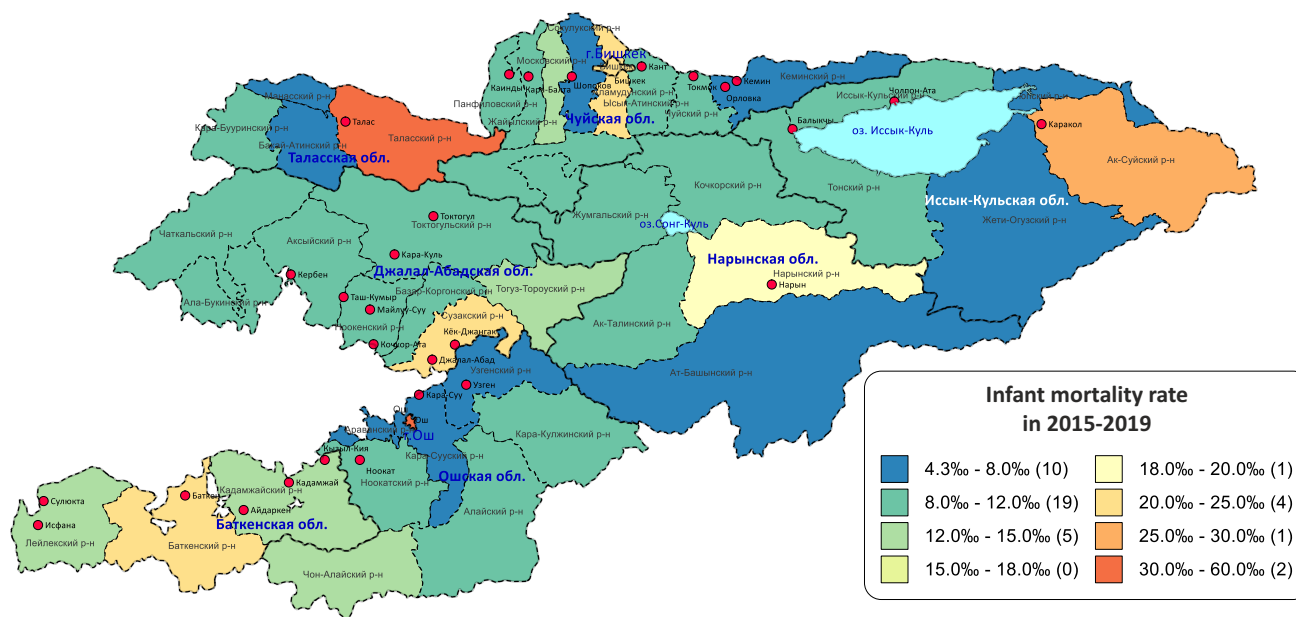
**With the improvement of the completeness of accounting and the reduction of the overall level, the territorial differences in infant mortality in the Kyrgyz Republic increase most significantly.**

If in 2006-2009, the minimum and maximum infant mortality rates for administrative districts differed by 3.6 times, then in 2010-2014, the variation factor increased to 7.6 times, and for the five-year period from 2015 to 2019 inclusive, it was already 10.8 times, with a minimum of 4.3 deaths under the age of one year per thousand births in the Tyupsky district of Issyk-Kul region to 46.3% in the city of Osh. At the same time, the territorial structure of infant mortality, at least for the last 15 years, remains almost unchanged. It is not difficult to see that the highest level of infant mortality is observed in those areas where the regional centers are located, and therefore, the maternity infrastructure is more developed.

**Map 6a:** Infant mortality rate according to current records, average over five years from 2006 to 2009.



**Map 6b:** Infant mortality rate according to current records, average over five years from 2015 to 2019.



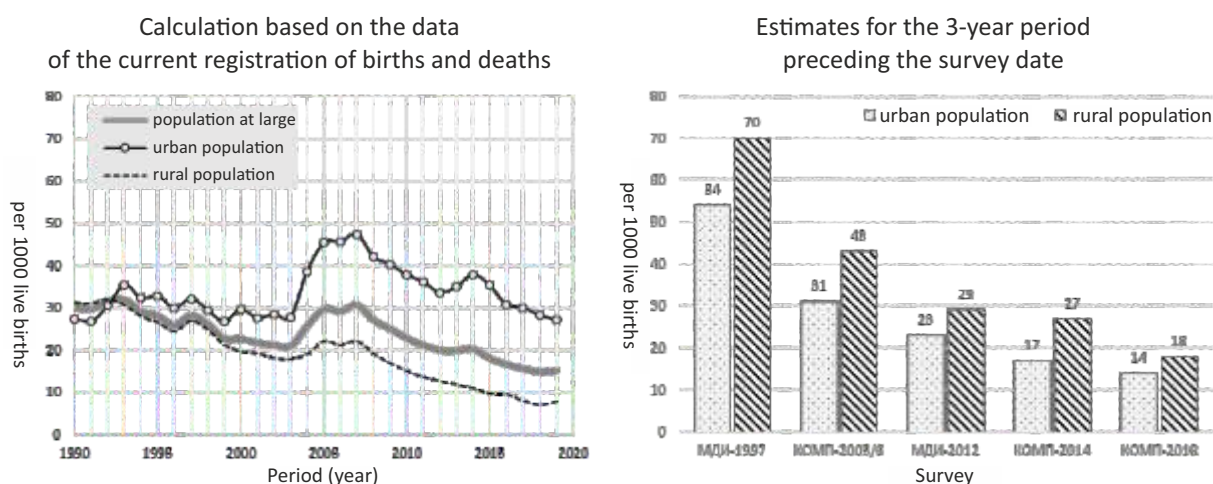
The National Statistical Committee of the Kyrgyz Republic consistently records the highest infant mortality rate in the city of Osh, followed by Talas district (with the regional center of Talas region), and the third, fourth and fifth positions in the list of anti-leaders are shared by the city of Bishkek, Ai-Sui district of Issyk-Kul region (with the regional center of Karakol) and Batken district (with the regional center of Batken region).

If we compare the territorial differences in infant mortality in the context of the regions of the Kyrgyz Republic with the allocation of the cities of republican significance Bishkek and Osh as separate observation units, the overall picture practically does not change. The lowest infant mortality rate (the average rank for 2015-2019) is consistently observed in the Osh region (2 times lower than the national average), followed by Chui, Naryn and Issyk-Kul regions, and the highest infant mortality is consistently recorded in the cities of Osh (3 times higher than the national average) and Bishkek (1.5 times higher). Talas, Jalal-Abad and Batken oblasts occupy an intermediate position between the "leaders and outsiders" in a dense group.

A completely different, diametrically opposite picture of territorial differences in infant mortality emerges based on the analysis of data from sample surveys conducted in 2014 and 2018. Indicators calculated on the basis of women's responses about surviving and deceased children indicate that the lowest infant mortality rate is observed in the city of Bishkek and the Chui region, and the highest in the Issyk-Kul, Naryn and Batken regions. The polarity also changes with regard to infant mortality in the city of Osh and the Osh region. According to MICS-2014 data, women living in a city of national significance had a mortality rate of children under the age of one year twice lower (17%) than women living in the Osh region (34%). However, the 2018 survey showed an infant mortality rate of 19% for the city of Osh and 15% for the Osh region.

The inversion is also observed when comparing the infant mortality rate in urban and rural areas, calculated on the basis of current accounting of births and deaths and on the basis of data from sample studies. If the current data show that, since 1993, infant mortality in rural areas is higher than in urban areas, and that the difference between them increases over time, then sample surveys, on the contrary, show that children under the age of one year in rural areas die more often than in urban areas, but over time, these differences between urban and rural areas decrease.

**Graph 43:** Infant mortality rate of urban and rural population in the Kyrgyz Republic, according to civil registration and sample surveys.



DHS - Demographic Health Surveys of 1997 and 2012

MICS- Comprehensive examination of many indicators, of 2005/6, 2014 and 2018

A comparison of infant mortality rates, calculated on the basis of data from various sources and differentiated by territory and by type of settlement, suggests that state infant mortality statistics most likely reflect the practice of registering deaths at the place of application, that is, localize the event by the place where it occurred, and not by where the risk of this event was formed. This state of affairs is of serious concern, since it is the State statistics that set the guidelines for organizing work to reduce infant mortality and improve the health of women and children in general.

Today, almost all residents of both urban and rural settlements are provided with highly qualified medical care during childbirth, and all births take place in well-equipped specialized medical institutions, maternity hospitals or hospitals, but the provision of qualified antenatal care and counseling in the city and in rural areas differs markedly.

**Table 1:** The proportion of women who received antenatal care and the qualifications of a specialist who provided such care in urban and rural areas of the Kyrgyz Republic according to the data of Demographic Health Surveys and Comprehensive examination of many indicators.

Survey	Urban areas		Rural areas	
	Doctor	Nursing staff	Doctor	Nursing staff
DHS-1997*	91,9	6,2	57,7	39,5
MICS-2005/6**	94,2	5,7	64,0	32,4
DHS -2012***	91,8	6,9	73,9	22,3
MICS -2014****	96,3 (86)	2,6	90,1 (79,5)	8,02
MICS -2018**	94,2	5,5	79,4	20,4

\* - all pregnancies during the 3 years preceding the Survey

\*\* - the last pregnancy that took place in the 2 years preceding the Survey.

\*\*\* - the last pregnancy that took place in the 5 years preceding the survey.

\*\*\*\* - the last pregnancy that took place during the 2 years preceding the survey; the calculation for three years is indicated in brackets, since the result of the CEMI-2014 falls out of the total observation series.

Since the majority of deaths of children under one year of age occur in the first month of life, and among the leading causes of death are those caused by the state of the mother's health, hereditary factors and the course of pregnancy, in order to reduce infant mortality, it is necessary to improve and increase the coverage of pregnant women with antenatal counseling and assistance where they live permanently, that is, where pregnancy occurs. That is, the level of infant mortality may depend on the availability of qualified medical care in the field, the density of medical support for pregnant women, as well as on living conditions (quality of drinking water, environmental pollution, climatic features).

Unfortunately, neither government statistics nor sample survey data allow for a more detailed analysis of the structure and factors of infant mortality, since the former, as just noted, suffer from a bias in localization estimates, and the latter do not contain a sufficient number of events for comparative analysis.

As for the data summarized at the national level, they clearly indicate positive trends in the dynamics of infant and child mortality. So, in 2019, the number of deaths in the neonatal period (less than 4 weeks of age) became less than 12 per thousand live births, that is, it fell below the target set by the sustainable development goals to achieve no later than 2030. With regard to the mortality rate for children under 5 years of age, the average for the five-year period from 2015 to 2019 was 19 deaths per thousand live births, which is also below the target level of 25 cases per thousand births set for 2030.

## **Maternal mortality**

Maternal mortality, as well as infant mortality, is estimated by assigning the number of women who died due to pregnancy and childbirth during pregnancy or no later than 42 days after its end to the number of children born alive, so if the number of births and deaths is sufficiently complete, current state statistics provide a fairly accurate assessment of this most important parameter of women's health.

Between 1990 and 2014, maternal mortality in the Kyrgyz Republic was quite high, hovering around 50 deaths per thousand live births, with annual fluctuations ranging from 60 to 40 deaths. Since 2015, the maternal mortality rate has steadily decreased and in 2019 reaches 24.8 deaths per thousand live births, that is, it falls below the 25 per thousand mark set by the Sustainable Development Goals to be achieved by 2030.

It is difficult to judge to what extent official statistics reflect the reality of the situation, because the estimation of the maternal mortality rate depends not only on the completeness of accounting and timely registration of births and deaths, but also on the peculiarities of coding the cause of death. Unfortunately, detailed information on the causes of death in the Kyrgyz Republic is not available in open sources, as already noted, and the mass sample surveys that were conducted in the republic were not focused on studying this phenomenon.

Available data for 2015 (Form C51), when from reasons related to pregnancy, childbirth and the postpartum period (ICD-10 class XV), 63 women died in the republic, show that for the most part (in 23% of cases) these deaths were caused by edema, proteinuria, hypertensive disorders (O10-O16 according to the ICD-10 nomenclature), that is, directly related to the history and health status of the pregnant woman, which led to preeclampsia (O14) or eclampsia (O15). Due to complications of delivery and childbirth (O60-O75), 13 women died in 2015. With a specific weight of 20%, this group of causes, including obstetric injuries and bleeding, in the ranking of causes of maternal mortality shared the second and third lines with "other obstetric conditions not classified in other headings). Another 19% in the structure of the causes of maternal mortality were complications associated mainly with the postpartum period. It is important to note the extreme rarity of such causes of maternal death as spontaneous abortion (O03, two cases in 2015) and unsuccessful attempted abortion (O07, one case of medical abortion).

In general, it should be recognized that maternal mortality in the Kyrgyz Republic is no longer a mass phenomenon and cannot be the subject of statistical analysis due to the small number of cases. However, the distribution of maternal mortality by cause does not allow us to say that deaths due to pregnancy, childbirth and complications of the postpartum period were accidental. It can be assumed that taking into account the medical history, health status, timely diagnosis and decision-making regarding the maintenance or termination of high-risk pregnancies can not only provide an additional reduction in the maternal mortality rate, but also make a certain contribution to improving women's health in general.

## **Conclusions**

In the next decade, the Kyrgyz Republic will face a number of serious demographic challenges that will require making strategic decisions in the field of economic and social policy.

Favorable opportunities for responding to demographic challenges are created by the fact that almost until the end of the 21st century in the Kyrgyz Republic there will be a positive balance between the population of working and non-working ages (demographic window, demographic dividend).

The most acute problems will be caused by the persistence of high rates of population growth in the foreseeable future.

In the specific natural and climatic conditions of the republic, rapid population growth leads to an increase in population concentration in the most urbanized zones, mainly around Bishkek city, Osh city and Jalal-Abad city.

Consequences of concentration around the largest cities can be an increase in urban development at the expense of agricultural land and an increase in the load on urban infrastructure (transport, sewerage, water supply, cleaning and processing of garbage and all types of waste).

Progressive growth of the population in the retirement age is expected in the republic, in connection with which it is of paramount importance to solve the problem of resource filling of the existing pension system, so as not to cause a landslide drop in the standard of living of the population.

The birth rate in the republic remains quite high, which is the main reason for maintaining high rates of population growth. This situation requires the development of a state social policy strategy that could harmonize assistance to poor families in order to maintain the standard of living and purchasing power of the population in order to curb population growth. Today, material support for poor families in many ways takes the form of a bonus for the birth and the presence of an additional child, which can slow down the decline in fertility to the optimal level.

The republic maintains a model of accelerated family formation with minimal intervals between births of children, which leads to a deterioration in the health of women and children and an increase in gender inequality, thus reducing the involvement of women in productive activities for a long period, with all the ensuing consequences (loss of qualifications, lower wages, lower old-age pension, etc.)

The situation with the provision of women of reproductive age with modern contraception, especially hormonal drugs, looks unsatisfactory. In particular, the widespread use of hormonal implants, introduced immediately after childbirth in a medical facility, could provide an increase in the intervals between births and thus improve the health of women and children.

The Kyrgyz Republic retains a significant reserve for reducing maternal and infant mortality primarily due to a more complete coverage of pregnant women with prenatal care, in particular, individualized medical support of pregnancy, starting from the earliest stages and expanding opportunities for early detection of genetically determined pathologies.

One of the consequences of the rapid growth and change in the age structure of the population of the republic is an increase in the intensification of the migration movement of the population. In recent years, the republic has seen a colossal outflow of the working-age population to foreign countries, primarily to the Russian Federation and Kazakhstan. Although, thanks to the labor migration of residents of the Kyrgyz Republic, considerable financial flows are sent to the country in the form of remittances, in the long term, the risks of economic and social losses increase due to the shortfall in contributions to national funds for social protection and development. Assessment of the immediate and long-term consequences of mass labor migration requires additional analysis, on the basis of which relations with countries receiving labor from Kyrgyzstan could be built and a national strategy on vocational training and labor migration developed.

The marked deterioration in the quality of data and statistics on population movements, especially at the regional level, is a major concern. Dissemination of the practice of registration of acts of civil status at the place of filing applications, without creating an appropriate mechanism for transmitting information at the place of residence, not only limits the possibilities for assessing the size and parameters of movement of the local population and reduces the possibilities for assessing the causes and factors of mortality and fertility, but it can also call into question the effectiveness of the functioning of the electoral system, both at the local and national levels.

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