



# REGIONAL DEMOGRAPHIC DISBALANCES IN BULGARIA-ANALYSIS OF POPULATION DYNAMICS, BIRTH RATE AND MORTALITY

N. Koleva\*, N. Vasilev, V. Zheleva

Department of Regional Development, Faculty of Economics, Trakia University Stara Zagora, Bulgaria

#### **ABSTRACT**

This article AIMS to analyze the regional demographic disbalances in Bulgaria for the period 2003-2023. It examines the main demographic processes – birth rate, mortality, natural increase and migration - and assesses their impact on the socio-economic development of the country, including the labor market, health, education and pension systems. The study is based on a quantitative analysis of statistical data from the National Statistical Institute (NSI) and INFOSTAT for the period 2003-2023. Standard demographic METHODS are applied to calculate and analyse birth rate and mortality. Data on internal and external migration, as well as on the population structure by place of residence (urban/rural) and by region are analysed. The analysis of the obtained results reveals critical demographic trends: a significant decrease in the population of Bulgaria by 1 355 792 people over the last 20 years, determined by a persistently low birth rate, a high death rate and a negative natural increase, which in 2023 will reach -6.8‰. Regional imbalances are deepening, with intensive depopulation of rural and northern areas of the country. Demographic ageing is accelerating, with the average age of the population reaching 45.2 years. These processes are putting severe pressure on social systems, leading to labour shortages and contributing to economic instability.

**Keywords**: demographic disbalance, birth rate, mortality, development, population

### INTRODUCTION

Demographic development, together with its structure, pose some of the main challenges facing Bulgaria. The long-term solutions that lie at the heart of these problems are effective policies and the motivation of the population, which will contribute to the development of the country economically and socially. The analysis of demographic reality shows that the priority must be to raise health awareness. The alarming data on the country's ageing population and high mortality rate allow for increased health care costs and pressure on the healthcare system. Morbidity has a significant adverse impact related to reduced working hours, increased health care costs, workload and involvement of able-bodied persons in caring for sick family members, high proportion of people with reproductive problems and high abortion rates in the country. Their impact leads to a declining

\*Correspondence to: Nansi, Koleva, Department of Regional Development, Faculty of Economics, Trakia University, Stara Zagora, Student Campus, e-mail: nansi.koleva.22@trakia-uni.bg, authors phone +359882110918 population and a significant deterioration in the quality and efficiency of human capital.

Another key element for the sustainable development of the country is the provision of employment and adequate remuneration for individuals. They are a key factor in the efficient use of labour, reducing poverty, economic and social insecurity and the percentage of people at risk. High levels of unemployment among young people, the elderly and people with disabilities have a negative impact on their mental health, security, sense of stability, social integration and delay the decision to start a family and have children. Some of the main reasons for the increased levels of emigration in recent decades are due to the low-skilled labour force, misvalued labour, the centralisation of socio-economic activities and processes, the lack of infrastructural development of particular sectors in the territory and other factors.

Effectively increasing employment is linked to education and training that is aligned with labour market needs, meaning that labour demand can more easily meet supply. This is why an active dialogue between business and politics is needed in identifying the reasons for the concentration of jobs mainly in large cities and the opportunities for business development in smaller settlements (rural areas), which will significantly reduce regional imbalances and demographic disparities.

#### **METHODS**

According to the NSI (1), in a birth rate survey the aggregate of births and the aggregate of children born have been observed. These were recorded at the time of their occurrence (appearance) and formed the corresponding period aggregates for a given timeframe. For the current vital statistics, this range was one calendar year. The term 'birth' means the completion of a pregnancy that results in the birth of a child. It includes live births and stillbirths, which exclude abortions.

The birth rate (B) is the ratio between the number of live births (within a year), and (N) the average annual population (S) in that year. It is calculated in percentiles (%) and indicates the number of live births per 100 population (1): B (%)=  $(N/S) \times 100$ 

According to the NSI (2), in a mortality study, the population of deaths is observed. Deaths are recorded at the time they occur and they form the corresponding period population for a given time range. For current vital statistics, this range is one calendar year.

The mortality ratio (M) indicates the number of persons who died per 100 persons in the average annual population. It is calculated in percentiles (%) as the ratio of the number of persons who died (MC) during the year to the average annual population (S) during the same year, (2): MC (%)= (M/S) x 100

The research methodology in the publication is based on the data on the permanent residents of foreign citizens and EU citizens in Bulgaria obtained on the basis of the permanent residence permits issued to foreign citizens on the territory of the country and the registration of EU citizens. The source of the data on foreign nationals permanently residing in the country was provided by the Ministry of the Interior (3). The object of study in demographic statistics is the totality of population processes and events associated with the movement of persons who have changed their usual place of residence. The

events are recorded at the moment of their occurrence and form the corresponding time periods. For current vital statistics, this coverage is one calendar year. According to the NSI, immigration means the act by which a person establishes his or her usual residence in Bulgaria for a period that is or is expected to be at least twelve months, the person having previously been habitually residing in another country. Emigration means the act by which a person who was previously habitually residing in Bulgaria ceases to be a resident of Bulgaria for a period which is or is expected to be at least twelve months (3).

### **RESULTS**

The paper analyses the demographic imbalances in Bulgaria for the period 2003-2023, identifying a significant population decline, conditioned by persistently low birth rate, high mortality, negative natural increase and increased emigration. It highlights the widening regional disparities, especially the depopulation of rural and northern areas in Bulgaria, with serious socio-economic consequences. These demographic trends are putting severe pressure on the labour market, health and pension systems, as well as on education, contributing to economic instability and low incomes. Population dynamics are determined by birth rate, mortality, natural increase and population movements within and outside the country. It is a statistically distinct non-constant quantity, the consequence of changes based on factors related to socioeconomic development at the local and national level.

# Population dynamics and numbers in Bulgaria

Changes in economic, social and demographic structures have left their imprints on the of contemporary development society. changing not only its dynamics but also its demographic shape. In Bulgaria, these processes are most often associated with intensive natural population movements, such as declining birth rates and high mortality rates. According to INFOSTAT (4), the population has decreased by over 800 thousand people in the last 10 years and by 1 355 792 people (18% of the total) in the last 20 years. This decline is precisely due to the negative natural growth that has been observed over the three periods under consideration (Table 1). As indicated in the table, migration processes have been declining during the period 2013-2023, in contrast to the next stage under consideration, which has seen an increase in the levels of migration processes in the country.

*Table 1. Demographic indicators of Bulgaria in the period (2003-2023) (5-7)* 

Demographic Indicators of Bulgaria (2003-2023)					
				2003-2023	
Indicators	2003	2013	2023	Change	2013-2023 Change
Total Population	7 801 273	7 245 677	6 445 481	-1 355 792	-800 196
Number of Births	67 908	66 578	57 478	-10 430	-9 100
Number of Deaths	111 927	104 345	101 006	-10 921	-3 339
Average Age (years)	40,8	43	45,2	4,4	2,2
Natural Increase (per					
mille ‰)	-5,7‰	-5,2‰	-6,8‰	-1,1‰	-1,6‰
External Migration					
(number)	356 751	18 570	56 807	-299 944	38 237
Internal Migration					
(number)	152 324	86 378	107 836	-44 488	21 458
Urban Population					
(number)	5 441 739	5 291 675	4 738 461	-703 278	-553 214
Rural Population					
(number)	2 359 534	1 954 002	1 707 020	-652 514	-246 982

As a consequence of this transition, there has been a significant imbalance between the different statistical regions over the years, with the most noticeable imbalance in the period 2013-2023. Due to the rapid population decline, the North Central and North West regions are the most affected, where the decrease between the periods amounts to around 19%. This is followed by the South Central (10.2%) and South East (10.4%) regions, while the South West (5%) region is the least affected (4).

The consequences of socio-economic processes create long-term imbalances that are difficult and slow to redress. These trends are exacerbating demographic problems linked to the depopulation of certain areas, particularly in the North-Central region, considered one of the least developed regions in the European Union. The data presented by INFOSTAT (4) further reinforce the uneven distribution of population among the different regions of the country.

Birth rate in Bulgaria

Birth rate is one of the key elements in demography, playing a role on the sustainable development of the country. It is a biologically and socially determined process influenced by various economic, demographic, political, physiological factors. In the period 2003-2023, there has been a significant decline in fertility with negative values equivalent to 10,430 total births (Table 1). The trend is similar for live births with a total decrease during the period amounting to 10,162 (15.08%), which is a prerequisite for the negative natural increase over the years against the background of high mortality. At the same time, the number of stillbirths dropped by about 50%, indicating improved health care. The total fertility rate increased in 2013 but subsequently declined and remained low by 2023. The total birth rate has shown an increase over the years, but remains below the EU average of 2.1 children per mother.

**Table 2.** Fertility data for the country (2003-2023) (5, 7)

Year	Live births	Stillbirths	Urban births	Rural births	Marital births	Non- marital births	Crude birth rate	Total fertility rate
2003	67 359	549	48 597	18 762	36 511	31 397	8.6	1.23
2013	66 578	483	49 526	17 052	27 339	39 722	9.2	1.48
2023	57 197	281	42 388	14 809	23 121	34 357	8.9	1.81

In terms of the distribution of the birth rate indicator values in urban and rural areas, a decline is reported again in rural areas (-21.7%) compared to urban areas (-12.7%). There is a significant decrease in marital births by more than -36%, while non-marital births increase by+ 9.4%, indicating changes in the social pattern and behavior of the population.

Some Bulgarian authors (8) think that the process of reproduction comes from the reproductive behavior of the population and their attitudes about the desired number of children, which includes the costs of childbirth and the costs of personal development. In this context, they distinguish between actions that encourage this process and factors that discourage it. The transition to a market economy, the economic crisis, the global financial crisis and the decline in income are some of the main factors responsible for the low fertility rate in the country, which have significantly changed the reproductive behaviour of the population.

Leading trends are related to new patterns of behaviour in women related to getting a good education and career development. This in turn gives rise to delayed planning and child rearing. In socio-demographic terms, this leads to an increase in the average age of women at the birth of their first child and a decrease in fertility, leading to the imposition of the one-child-per-family principle. The same set of authors (8) conclude that low fertility and birth rates, together with high mortality, will continue to determine high depopulation rates. Regional differences and migration movements also contribute to low birth rate. Urbanization and easier access to childcare and health care facilities in cities determine lower fertility in rural areas.

## Mortality in Bulgaria

Mortality is part of demographics, it is not only a biological process but also a result of social and economic factors. Its influence has an impact on the size and structure of the population, plays an important role in determining the total population of a territory. As a process, it is directly involved in the formation of the country's natural growth rate and the age structure of the population and, last but not least, the expected life span is determined by this demographic process.

**Table 3.** Country mortality data (2003-2023) (4)

Year	Number of Deaths	Overall mortality	Infant mortality	Premature mortality	Urban mortality rate	Rural mortality rate
2003	111 927	14.3	12.3	24.4	11.8	20.0
2013	104 345	14.4	7.3	22.4	12.1	20.5
2023	101 006	15.7	4.9	20.1	13.7	21.0

Within the above period, there are significant changes in mortality presented in (**Table 3**). The total number of deaths in the country increased by 10,921 days, or 9.76%, with the overall mortality rate increasing to 9.79% for the entire period. This is due to the high mortality rates among the working age population and the change in the age structure towards demographic ageing. At the same time, infant mortality declined by 60.16% for the entire period due to improvements in newborn health care and advanced medicine. Premature mortality also declined by 17.62%, an indication of improvements in population care across age groups. In parallel, there are differences in urban and rural mortality rates as in rural areas.

According to INFOSTAT data (4), the main causes of death in the country during the period under review were: cardiovascular diseases,

neoplasms, respiratory system, digestive diseases, diabetic diseases, obesity and others. In 2003, the highest mortality rate was observed in diseases of the circulatory organs with 68%, reaching 61% in 2023. For neoplasms, there is a 4% increase in 2013 over 2003, reaching 17% in 2023. Diseases of the respiratory system and digestive system also increase by 2% each over the period 2003-2023. At the same time, tuberculosis, COVID 19, road traffic accidents have the lowest proportion where cases are decreasing significantly (4). The Annual Report on the State of Citizen's Health (9) identifies the factors of smoking, alcohol consumption, unhealthy diet and reduced physical activity as the main causes of death from chronic noncommunicable diseases in the country. Public health analyses have been shown to fall short of the level required in relation to data from other countries.

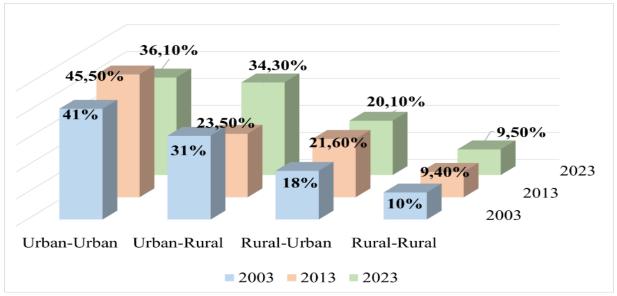
Demographic ageing is a phenomenon that has a direct impact on the socio-economic future of a country. The economic consequences of this process, according to a team of authors, include changes in employment levels, along with the structure and composition of the workforce, changes in savings patterns, changes in the rate of development in the economy, and changes in market development (10).

Another author (11) considers that an increase in the proportion of the elderly population in a country will lead to pressure on the social services through increases in health and pension expenditure. In the future, this will give rise to concern and the need to adapt social security systems to ensure intergenerational equity and solidarity. According to another study, ageing has an impact on the culture and politics of a country. A change on the demographic structure of the population as a whole can change both the

public mindset of the people but also the foreign policy relations of the country (12).

# Impact of migration on demographic structure

In internal migration, there has been a territorial demographic imbalance between the different destinations over the years (Figure 1). It is noticeable that the most pronounced movement is in the "city-urban" direction, while the movement in the "village-rural" direction has significantly decreased over the years. In 2023, the "urban-rural" direction increases, which may be related to the growing interest in environmentally friendly and peaceful settlements. However, the internal migration data show an uneven distribution of population between the different directions, allowing for reduced reproduction and an ageing population, especially in rural areas (5-7).



**Figure 1.** Population movements by destination (2003-2023) (5-7).

External migration takes into account the deteriorating economic situation. limited development opportunities and uncertainty in Bulgaria, which prompt the local population to seek better opportunities and development abroad. In this order of outward migration, the population is experiencing additional pressures and challenges related to an ageing population and a reduced proportion of people of working age.

The unfavourable demographic trends stimulate the development of policies for the return of the Bulgarian population to the country, but also for attracting foreigners in order to stabilise the labour market. This is why, between 2013 and 2023, there has been a decline in the number of emigrants by 4,451 and an increase in the number of settlers in the country in 2023, 65% of whom are foreigners (6, 7) (**Figure 2**).

The analysis shows that our country is characterised by a declining population, reduced fertility, negative natural growth and an ageing population. The projections presented in **Table 4** shows a deepening of the negative trends, with a population decline of more than 1 million people, low fertility, negative natural increase and a median age of 73.5 in 2050.



Figure 2. Incoming and outgoing migration of Bulgaria (2023) (7).

**Table 4.** Population Dynamics in Bulgaria: Historical Data and Long-Term Forecasts (2003-2050) (13).

Indicators	2003- 2023	2025-2050
Population	In 2003, the population was approximately 7801 273, while in 2023 it had declined to 6445 481. The total decrease over the period is 17,4%.	Projections indicate that by 2050, the population will decrease further to approximately 5300 000.
Birth Rate	In 2003, there were 67908 registered births, compared to 57478 in 2023, indicating a clear decline in birth rates over the period.	Projections suggest that the birth rate will remain low, while mortality and high emigration are expected to prevail.
Mortality Rate	There were 111927 deaths in 2003 and 101006 in 2023, showing a slight dexline. However, due to lower birth rates, natural growth remains negative.	Forecasts suggest mortality will continue to outpace births, contributing to rapid population decline.
Natural Increase	The period is marked by negative natural growth, with the highest recorded value being -6,8 % in 2023.	Projections for the 2025-2050 period indicate that natural growth will continue to remain negative.
Age Structure	The average age increased from 40,8 years in 2003 to 45,2 years in 2023, primarily due to population aging and declining working capacity.	Studies suggest that the age dependency ratio will continue to rise, reaching approximately 73,5 by 2050.

# **Regional differences in population**

Historical transitions in Bulgaria have played an important role in demographic development, such as industrialization, which significantly affected the territorial distribution of the population. Prior to this, people lived and worked mainly in rural areas due to the developed agricultural sector. In the period

1965-1985 (**Figure 3**), there was a mass exodus of people from the villages to the cities in search of a better life and social services. This largely contributed to exacerbating demographic problems such as depopulation of areas, low fertility rates, lack of labour and limited access to resources (14).

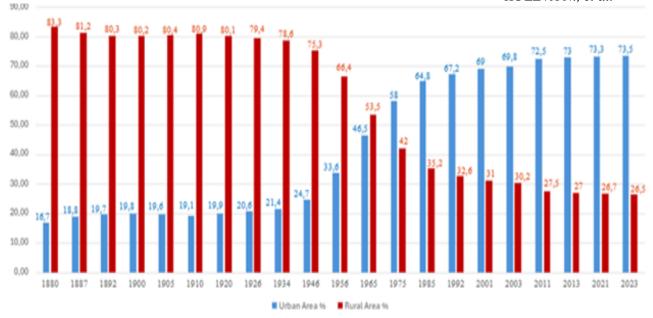


Figure 3. Proportion of urban and rural population by year (14).

# Regional demographic disbalances and socio-economic effects

The country's labour market is under considerable pressure due to an ageing population and a shrinking labour force, and the increase in labour demand is allowing the potential labour supply to fall (15). Alongside this, Bulgaria faces significant intra-regional disbalances, particularly pronounced between the capital and the rest of the country, and between North and South Bulgaria. These inequalities continue to widen, despite the country's membership of the European Union and funding through European and national programmes, and the slow impact of policies intensifies competition further between countries (16).

Trends in health services in recent years indicate significant inequalities between different sections of society, with 20-40% of them experiencing difficulties in purchasing medicines. In this regard, the income of the population is closely related to the quality of health care of the population with those with lower incomes being referred to general practitioners (17). Different studies support the thesis that the costs of health services are not covered by the respective funds but by the population of the country, which allows the imbalance in the health system through the ceiling of insurance income.

Education, as a structural element in socioeconomic growth, plays an important role in the long-term development of the country. In Bulgaria, however, demographic analyses show a significant number of illiterate people and people with low education, low investment in education - only 4%, which is below the average level in the European Union. These problems allow the young population to migrate, not only in search of a better quality of life, but also in an effort to study in more prestigious educational institutions in other countries (18).

In a study by a Bulgarian author (19), the main factors that influence the educational sphere are identified, namely: the geographical area in which the educational institutions are located, the differences in income, the ethnic composition of the population.

The prevailing demographic crises in the country have put a significant strain on the pension system and, in view of this, there has been a decline in the working age population and their declining contributions. These pressures are allowing an overload in having to fund pensioners and social services in general. Therefore, the state is committed to create various programs and measures to integrate the elderly population into the labor market and accordingly raise the retirement age depending on the activity they perform (20). However, a number of Bulgarian authors (21) accept these strategies as limited and propose measures that will encourage the active population and improve the age structure of the population.

The depopulation of areas brings with it a number of socio-economic challenges. A group of authors (22) describe the consequences associated with this crisis in territories with significantly declining populations and reduced economic activity. Depopulation in certain areas and villages leads to the deterioration of infrastructure, marginal use of land and building stock, decline in economic development and destabilization, closure of important social services such as health, education and transport - significant for the development of any region.

### **CONCLUSION**

In view of the need for urgent measures to address the negative trends in the country, a Strategy for Demographic Development of the Population in Bulgaria for the period 2012-2030 was established (23). It is aimed at increasing fertility through various allowances and incentives, as well as facilitated access to services. In addition, reducing mortality remains an important priority, and this is why the plan aims to improve the quality of social services, create a favourable environment for living and raising children and an active life for the elderly population, which will enable the next objective of the plan to be realised, namely the re-emigration of the country's population as a whole and a reduction in depopulation (24).

The international experience in dealing with demographic disbalances in countries such as Germany, France, Italy and Sweden is focused on the implementation of various incentives and policies which Bulgaria can adopt as well. For decades, countries have continued to develop birth rates using various benefits and tax breaks. In Italy, it applies a benefit for parents and additional services for the purchase of a home through a mortgage loan, as well as the possibility to combine professional and private life (25).

In relation to ageing, approaches such as participation of the older population in the labour market and promoting later retirement are being implemented. With regard to migration, Germany uses methods to attract labour due to a lack of personnel, other countries for example support migrants through benefits and programmes, and Poland for example refunds GST for migrants (26).

Overcoming the negative trends requires measures by the state to stabilize demographic indicators and create favorable conditions. This is to be achieved through support for young parents, access to quality childcare and worklife balance.

Free examinations, support and providing opportunities for younger generations to

develop their skills is also a good coping mechanism. Government policy provides for easier access to the labour market as well as affordable housing, introducing health classes that will increase the knowledge and culture of students. Non-financial incentives are also used to motivate minorities in the education system, care for the elderly and maintain their wellbeing, and address labour shortages through managed legal migration (27).

The analysis shows a significant population decline, persistently low birth rates, increased emigration and immigration, negative natural growth over the years, combined with an ageing population. Regional disparities are widening, especially in rural areas, contributing to depopulation, migration of young people and a lack of economic prospects.

Significant reductions have been recorded in mortality, indicating improved care in the health sector, but given this, there are significant pressures on both it and the whole social system. The pension system is also under strain due to the significant proportion of elderly people, a shortage of people of working age and the lack of effective conditions for integrating the population into the labour market. In addition, the prevalence of illiteracy hampers their social and economic integration.

Negative trends and pressures on social systems lead to the economic instability the country is experiencing, low incomes and significant levels of unemployment. On the one hand, this influences the behaviour of the population in search of better opportunities abroad; on the other hand, it has a negative impact on family formation. In response to this, the state is implementing policies to improve demographic indicators. Despite some progress, the measures are not achieving long-term and sustainable results, which requires a search for new approaches using the methods applied in other countries.

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