THE POPULATION OF MOLDOVA IN 2040: ECONOMIC AND SOCIAL IMPLICATIONS OF DEPOPULATION AND DEMOGRAPHIC AGEING[1]

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Abstract. *The article presents the results of the demographic projection for Moldova from 2023 to 2040, highlighting critical trends in fertility, life expectancy, and migration. The projection outlines three potential scenarios—high, medium, and low—each offering different outcomes based on varying levels of improvement in healthcare, social policies, and migration patterns. Across all scenarios, the country is expected to experience a significant population decline due to low fertility rates, negative natural increase, and sustained emigration, particularly among the younger, working-age population. The article emphasizes the accelerating demographic aging process, which will place increasing pressure on the shrinking workforce to support a growing elderly population. The scenarios also explore the potential for mitigating these challenges through improved health services, increased fertility rates, and reduced emigration. However, even in the most optimistic scenario, the demographic decline remains a pressing issue. The results underscore the need for comprehensive, forward-thinking policies aimed at addressing the root causes of demographic decline. Proactive measures in healthcare, family support, and economic development are crucial to reducing the impact of these demographic trends and ensuring sustainable growth for Moldova's future.*
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UDC*: 314.1(478)*

Introduction. Demographic projection is an important tool in policy development, as it provides valuable insights into future population trends and their potential impacts on various sectors of society. By anticipating changes in population size, age structure, and distribution, policymakers can better plan for future needs in areas such as healthcare (Islam, Mitra, 2024), education (Dias, 2014), housing, and labor markets. The importance of accurate population forecasts for the effective management of demographic changes and long-term policy planning is emphasized (Buettner, 2022). Presenting projection results to decision-makers in a clear and easily understandable format, and offering scenarios that demonstrate the impact of

[1] The report was presented during the plenary session.

certain policy measures on demographic changes, as well as on economic and social domains, is the aim of the researchers (Johnstone, 2016).

Demographic projections allow for more informed decisions regarding infrastructure development and resource allocation, ensuring that public services are adequately prepared to meet the needs of evolving populations. They also enable the identification of potential risks associated with migration patterns, both in terms of immigration and emigration, allowing for more proactive policy responses to these dynamics. In short, well-founded demographic projections are crucial for long-term strategic planning, guiding policymakers in creating sustainable solutions to meet the challenges of changing population trends.

Moldova, like other Eastern European countries, faces serious demographic challenges that are attracting increasing attention from policymakers and require the development of special policy measures to mitigate the negative effects of depopulation and population ageing. High levels of emigration of well-educated young people significantly complicate the consequences of the demographic transition from high to low levels of fertility and mortality. The researchers note that comprehensive population projections are critical for national planning efforts, especially in countries with major demographic shifts in motion (K.C., & Gailey, 2023). In this context, new approaches to developing demographic forecasts have emerged, incorporating an educational component alongside age and gender. This has made it possible to assess the impact of increased education levels, and consequently the quality of the labor force, on mitigating the effects of population aging (Lutz et al., 2019; K.C., & Gailey, 2023).

In Moldova, efforts are ongoing to improve demographic projection methods. Typically, the national demographic projection is updated every two years (Gagauz et al., 2021). This article analyzes the results of the 2024 demographic projection series, projected through 2040.

Projection`s methodology. The demographic projections for Moldova in 2040 outline three potential scenarios, each based on different assumptions about fertility rates, life expectancy, and migration patterns *(Table 1).* In all scenarios, life expectancy is projected to increase for both males and females, reflecting improvements in health and longevity. The total fertility rate shows varied outcomes across the scenarios, with some projecting slight declines (low scenario) while others anticipate moderate increases (medium and high scenarios). Migration remains a challenge, but each scenario suggests a gradual reduction in the rate of negative migration, indicating potential improvements in retaining or attracting the population.

Table 1. **Demographic projections scenarios**

Indicators	Life expectancy, female, years	Life expectancy, male, years	TFR, births per woman at reproductive age	Net migration, % in total population
Base, 2023	76.04	67.50	1.62	-1.01
Projection 2040				
Scenario 3 (Low)	79.24	70.72	1.60[1]	-0.69
Scenario 2 (Medium)	80.02	73.90	1.74	-0.31
Scenario 1 (High)	81.13	74.86	1.93	-0.10

Compared with the previous forecast (Gagauz et al., 2021), the scenarios for reducing mortality and increasing life expectancy have been significantly improved. This is due to the improvement of the technical equipment of medical facilities and the improvement of the quality of emergency medical care, which has contributed to the significant increase in life expectancy in recent years. Also, we improved the migration scenario, based on the fact that the growth of investments and the improvement of the economic situation can contribute to the reduction of population outflow in the next years. In the low scenario net migration will reduce by 30%, in medium by 70% and in the high by 90%. Also, when forecasting migration, it is assumed that it will be significantly reduced at young ages. Thus, the low scenario, which is considered the most likely, assumes a significant improvement in life expectancy alongside a reduction in migration. The anticipated decline in the TFR in this scenario is also seen as the most probable, given the ongoing transition from a traditional fertility model to a modern one, where individuals increasingly postpone having children until later in life (Grigoraș & Gagauz, 2022).

Main results. The demographic projection indicates that the Republic of Moldova is set to experience a period of rapid depopulation over the next two decades *(Table 2).* This trend is consistent with previous projections developed by the Centre for Demographic Research, which identified the same challenges, thereby validating the methodological approach used in forecasting demographic trends, particularly in scenarios concerning fertility, mortality, and migration dynamics (Gagauz et al., 2021).

According to Scenario 1 (low), which presents the highest degree of probability, the population number will decrease from 2423.3 thousand in 2023 to 1835.9 thousand in 2040, or by approximately 24%. The high level of demographic decline is caused by high emigration rates, relatively low fertility, and high mortality.

[1] When forecasting the birth rate, we based our assumptions on the idea that the decline of the indicator to 1.62 in 2023 is opportunistic, reflecting the population's reaction to the conflict in neighboring Ukraine. Consequently, for 2024, we projected the TFR at 1.7 across all scenarios, with any further growth or decline occurring de facto from this baseline TFR of 1.7.

According to Scenario 2 (medium), by 2040, the population will decrease to 1955.6 thousand people, a reduction of 19.3%. This scenario assumes a slight improvement in emigration rates and modest improvements in fertility and mortality rates compared to Scenario 1. Scenario 3 (high) is the most optimistic and suggests the smallest population decline. By 2040, the population is expected to decrease to 2101.7 thousand, a reduction of only 13.3%. In this scenario, a substantial reduction in emigration, a significant increase in fertility, and a rise in life expectancy are assumed.

Table 2. **The demographic projection results**

	Total population, thousand	**Change, thousand**		
		Total	**due to a natural decrease**	**due to emigration**
Base (2023)	2492.3			
Scenario 1 (High), 2040	2103.6	-327.7	-164.9	-162.8
Scenario 2 (Medium), 2040	1962.2	-469.1	-258	-211.1
Scenario 3 (Low), 2040	1835.2	-596.1	-327.7	-268.4

The age-sex pyramids (Figure 1 and *Figure 2)* vividly demonstrate the deepening of the demographic aging process. In the coming decades, many generations born in the 1960s will reach old age, significantly increasing the proportion of older individuals within the population. The share of people aged 65 and over is projected to increase from 17.4% of the total population in 2023 to 26.3% by 2040 (in the low scenario). The differences in the proportion of older people between various scenarios are minimal. Old age will reach the living generations, who are at present 50 and over, a group that has not experienced significant emigration. Moreover, there is a trend of return migration among individuals aged 50 and older, which will contribute to the rising number and proportion of older people in the coming years. Ageing of the older population is an important trend. Percentage of the “oldest old” (80+) in older population (65+) will double. In absolute numbers, the increase is from 59.8 thousand in 2023 to 130.8-154.1 thousand in 2040, depending on the scenario.

The smallest generations will be those in their 30s and 40s, representing today's young people who are actively involved in international migration, either for education or in search of a job. This trend of youth migration has significant implications for the demographic structure of the population. The loss of young, educated, and skilled individuals to other countries lead to a brain drain, negatively impacting the country's economic growth and innovation potential. Additionally, the departure of these young people leads to a reduced number of births, further accelerating the aging process of the population.

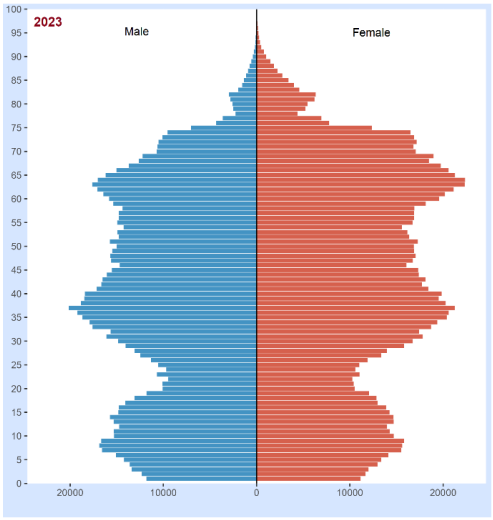

Figure 1. **Age-sex pyramids, 2023**

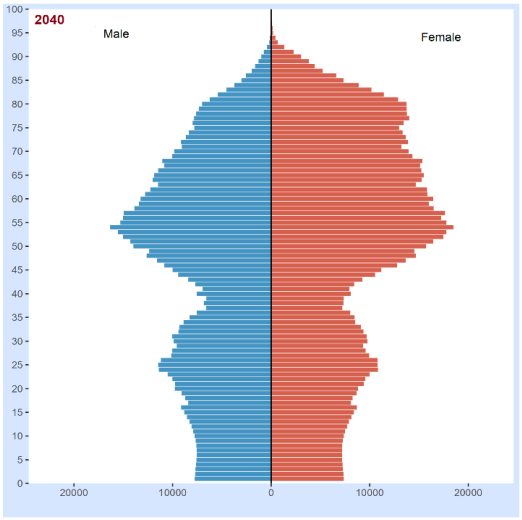

Figure 2. **Age-sex pyramids, 2040 (low scenario)**

Meanwhile, the largest generations of the population, those born in the 1980s, will still be of working age. This demographic group will play a crucial role in sustaining the economy, as they will form the backbone of the labor force. The share of the working-age population, aged between 20 and 64 years, will indeed decline, but it is expected to remain above 55% of the total population in the coming years. This means that, although the demographic structure is shifting towards an older population, there will still be a substantial portion of individuals within the working-age bracket. Their economic productivity and contribution will be vital in supporting the aging population.

The projected reduction in migration among younger age groups, as assumed in our development scenarios, could help stabilize the number of births. In the low scenario, the number of newborns may fall to 15.0 thousand. Conversely, in the high scenario, after an initial decline, births could increase to 22.7 thousand—though still lower than in 2023. However, over the long term, this could lead to improvements in the population age structure and lay the foundation for mitigating further demographic decline.

The 2023 base values for life expectancy, fertility rate, and net migration highlight significant demographic challenges, including an aging population, a shrinking workforce, and high emigration rates. Addressing these issues requires comprehensive and forward-thinking policies aimed at enhancing healthcare, supporting families, attracting and retaining talent, and ensuring the sustainability of social and economic systems. By proactively addressing these demographic trends, the country can diminish demographic decline (middle and high scenario) and create opportunities for an aging society.

Economic and social implications of demographic decline and demographic ageing. As the population decreases, several intertwined economic and social issues emerge, further complicated by the aging demographic. Firstly, the

reduction in population leads to an increase in the per-head cost of providing services. With fewer people to distribute the costs, each individual's share of funding for public services like healthcare, education, and infrastructure grows, which can strain both government budgets and individual finances. Simultaneously, tax revenues decline due to a smaller workforce contributing less in income and consumption taxes. This decrease in revenue occurs just as the demand for certain public services increases, particularly those related to health and elder care, putting additional pressure on government finances.

A contraction of the labor market can significantly hinder economic growth. With fewer working-age individuals, the workforce shrinks, reducing the economy's potential output. This reduction in the labor force also leads to a shrinking base of contributors to pension systems, which makes it challenging to sustain financial support for the aging population. Moreover, the emigration of young, educated, and skilled workers intensifies the "brain drain" phenomenon, further limiting Moldova's capacity for innovation and development. The situation is exacerbated as the demographic shift towards an older population increases, intensifying the burden on pension systems.

Demographic aging amplifies pressure on social services and healthcare systems as well. Older populations typically require more medical care, and an increase in the proportion of elderly people can overwhelm health services, leading to longer wait times, reduced access to care, and potentially lower quality of care. Additionally, this demographic trend challenges healthcare systems to adapt, requiring more resources, a larger workforce, and innovations in geriatric care to meet the complex health needs of aging populations. The growing dependency ratio further exacerbates these pressures, as fewer working-age individuals are available to support an expanding elderly population, heightening the fiscal demands on healthcare and pension systems. The increasing demand for pensions and healthcare services is projected to result in substantial fiscal imbalances (Prohnițchi, 2024). A more comprehensive approach to healthcare and long-term care is also critical in managing the needs of an ageing population.

The depopulation of rural localities, a phenomenon currently being observed, increases the vulnerability of the remaining residents. These areas often see a reduction in access to essential services such as healthcare, education, and public transportation, which can compound isolation and economic decline. The depopulation can also lead to underutilized infrastructure, wasted resources, and increased per capita costs of maintaining necessary services, further exacerbating the challenges faced by these communities.

Additionally, demographic ageing will affect intergenerational relations, placing greater caregiving responsibilities on a smaller number of individuals, which may lead to increased social inequality and family stress. Addressing these challenges requires coordinated policy interventions aimed at improving healthcare, promoting active ageing, and creating economic opportunities that can help retain young talent and support a more sustainable demographic structure.

These interconnected factors illustrate the complex challenges that arise from demographic decline and ageing. And in this context **adapting to a shrinking and ageing population must become the primary economic and social strategy.**

To effectively address the demographic challenges facing Moldova, a combination of economic and social measures is necessary. Key strategies include promoting full employment by creating more jobs and extending the working lives of individuals. Additionally, improving the integration of young people into education and the labor market is vital for reducing emigration rates and retaining talent within the country. According to the projection results, a decrease in youth migration will help create the conditions necessary for stabilizing the demographic situation and potentially increasing the birth rate. By retaining more young people within the country, the likelihood of family formation and higher fertility rates improves, contributing to a more balanced population structure over time.

Supporting family formation and incentivizing childbearing among younger generations are critical strategies for narrowing the gap between current fertility rates and the reproductive intentions. By offering comprehensive policies that address economic, social, and housing challenges faced by young families, governments can create a favorable environment for childbirth. This may include providing financial incentives, improving access to affordable childcare, ensuring job security, and offering parental leave benefits. Additionally, fostering work-life balance and creating supportive community networks can play a key role in encouraging young couples to have children. These efforts contribute not only to increasing fertility rates but also to promoting long-term population stability and mitigating the effects of demographic ageing, ensuring a sustainable future workforce and economic growth.

Equally important is improving the health of today’s younger generations, which will not only enable them to contribute more effectively to the economy and society but also help reduce future healthcare costs. By combining these measures, Moldova can develop a well-rounded response to the demographic changes it is experiencing, ensuring sustainable economic and social development in the long term.

Depopulation and population ageing are challenges faced not only by Moldova but by many other Eastern European countries as well. Learning from successful approaches in these regions can help accelerate the development and implementation of effective policies aimed at mitigating the negative impacts of demographic changes. As an example of intelligent depopulation management, Estonia's "Smart Depopulation" Program offers an innovative approach to addressing demographic challenges, focusing on adapting and optimizing infrastructure and services in response to population decline. Faced with similar depopulation challenges, Moldova can learn from Estonia's experience and adapt similar solutions to its specific context. Estonia has effectively implemented inter-communal cooperation solutions for resource sharing and joint provision of public services. As this example shows, collaboration can play a pivotal role in shaping sustainable solutions to the complex issues of declining populations and ageing societies. Moldova can learn from this model and encourage collaboration between administrative-territorial units (ATUs) to manage common infrastructure, such as roads, sewer systems, and service

centres. Resource sharing among localities can reduce costs and increase efficiency in regions with significant demographic decline.

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