

POPULATION AGEING IMPACT ON HEALTH EXPENDITURE: EVIDENCE FROM MOLDOVA

Olga Gagauz – Mariana Buciuceanu-Vrabie

Abstract

Population ageing is a major demographic trend reshaping healthcare systems in Eastern Europe, including Moldova. The increasing number of older adults is likely to put more pressure on health spending, especially given limited public resources and a high proportion of out-of-pocket costs. This study aims to evaluate the potential impact of population ageing on health expenditure in Moldova up to 2040. The analysis combines National Transfer Accounts (NTA) for 2023, which provide age-specific per capita public transfers for health, with demographic projections 2023–2040. The methodology applies baseline age profiles of health spending to projected population structures and examines alternative scenarios of per capita expenditure growth.

The results suggest that by 2040, the number of people aged 65 and above will grow substantially, while the proportion of those aged 80 and above will nearly double. As a result, total public health expenditures for older adults are expected to increase significantly, with their share of overall health spending rising from the current level to over one-third by 2040.

The results highlight the urgent need to bolster policies on healthy ageing, long-term care, and financial protection in health to ensure sustainability and fairness in access to medical services in an ageing society.

Keywords: population ageing, health expenditure, National Transfer Accounts, demographic projections

JEL Code: H51, I18, J11

Introduction

Population ageing is one of the most significant demographic transformations reshaping Moldova's society and economy in the 21st century. The national demographic projection to 2040 confirms a continuing population decline combined with an accelerated increase in the share of older persons. According to the baseline scenario, Moldova's total population is

expected to decrease from 2.42 million in 2023 to approximately 1.84 million by 2040 (–24%), driven by persistently low fertility rates, high emigration, and rising longevity. At the same time, the share of people aged 65 and over is projected to rise from 17.4% in 2023 to 25-26% by 2040, while the proportion of those aged 80 and over is projected to double, from about 14% to 27% in the total population aged 65 and over (Gagauz et al., 2024).

These demographic shifts will have far-reaching implications for the sustainability of the health system. Population ageing not only increases demand for health and long-term care services but also alters the structure of health expenditures, as older adults have considerably higher per capita healthcare needs. In Moldova, these challenges are compounded by structural weaknesses in the healthcare system: limited public resources, high out-of-pocket payments (27,5%), and an ageing health workforce (AHEAD, 2022; Euronews (2025)).

Understanding the magnitude of the financial pressure that population ageing will impose on the healthcare system is therefore crucial for planning and policy. The study presented in this article aims to estimate the potential health expenditures associated with demographic ageing in Moldova up to 2040. It combines National Transfer Accounts (NTA) for 2023, which provide detailed age-specific profiles of public health transfers, with the most recent demographic projection developed by the Centre for Demographic Research of the National Institute for Economic Research (Gagauz et al., 2024).

By applying baseline age-expenditure profiles to the projected population structure under different assumptions of per capita spending growth, the study quantifies the demographic component of the change in health expenditure. The results aim to inform policymakers about the scale of ageing-related pressures and support the development of sustainable health financing and healthy ageing strategies in Moldova.

1 Literature review

The relationship between population ageing and growth in health expenditure has been widely analysed in demographic and health economics research. Early studies (de Meijer et al., 2013) emphasised that population ageing alone explains only a limited share of health expenditure growth, as other factors, such as technological change, income growth, and institutional arrangements, also play a significant role. Nevertheless, ageing remains a key driver of the shift in health spending patterns toward older age groups. Recent studies confirm that population ageing puts upward pressure on health-care systems, as a rising share of older adults generally contributes to higher health expenditures. However, the dynamics

of health expenditure depend on morbidity patterns, time-to-death, and institutional characteristics of the health-care system. The literature shows substantial ambiguity and heterogeneity regarding how age, time-to-death, and morbidity influence different categories of spending, particularly outpatient services and pharmaceuticals (Kallestrup-Lamb et al., 2024).

Cross-national analyses further confirm that demographic ageing affects not only the level but also the structure of health expenditures. Ghaemi Asl and Mirzaei Abbasabadi (2021) presented a global overview demonstrating that countries with advanced ageing experience both higher per capita health spending and faster growth in long-term care costs. Similarly, Krabbe-Alkemade et al. (2020) found that in the Netherlands, reforms aimed at cost containment did not offset the ageing effect, leading instead to a redistribution of expenditure toward the oldest population segments.

Regional studies from Central and Eastern Europe provide additional insights. Fiala and Langhamrová (2020) analysed healthy ageing in Czechia and highlighted that the increase in life expectancy without disability may mitigate fiscal pressures. Kálmán, Juhász, and Tóth (2020) examined the Visegrad countries and concluded that population ageing has already become a significant determinant of public health budgets. Mach (2021) also noted that promoting healthy ageing can reduce the intensity of healthcare use among older adults.

At the macro level, Globerman (2021) emphasised that in Canada, ageing contributes to a gradual but predictable increase in health spending, while policy responses should focus on efficiency rather than cost reduction. Comparative studies by Skiadas and Skiadas (2020) situated these findings within the broader demographic and epidemiological context, demonstrating that ageing-driven health expenditures necessitate long-term strategic adaptation of health systems.

This study represents the first comprehensive application of age-specific public health expenditure profiles within the NTA methodology to long-term projection of the impact of population ageing on budget expenditures in Moldova. The authors' novelty lies in linking detailed NTA profiles for 2023 with official population projections through 2040, enabling a quantitative assessment of the net demographic impact on future healthcare spending.

2 Data and Methodology

The analysis focuses on the period from 2024 to 2040, using 2023 as the baseline (observed) year. The age profiles of public health transfers were obtained from the Moldovan NTA

for 2023, representing public transfers inflows per capita (nominal) across standard five-year age groups (0–4, 5–9, ..., 80–84, 85+). The demographic projections for 2024–2040 are disaggregated into exact age intervals. Both datasets were harmonised to ensure consistency in age definitions.

Computation of Age-Specific Expenditures. For each five-year age group g , the per capita value in 2023 is denoted as $c_{\{g,2023\}}$, and the projected population in year t as $N_{\{g,t\}}$. Three scenarios of nominal per capita growth are defined:

- Baseline: no growth in per capita spending ($g_{pc} = 0\%$);
- Medium: moderate annual growth of 1.5%;
- High: accelerated annual growth of 3.0%.

For each projection year $t = 2024, \dots, 2040$, per capita expenditures are calculated as:

$$c_{\{g,t\}} = c_{\{g,2023\}} \times (1 + g_{pc})^{(t - 2023)}.$$

Total public health expenditures by age group are then estimated as:

$$E_{\{g,t\}} = N_{\{g,t\}} \times c_{\{g,t\}},$$

and total national expenditures as the sum across all age groups:

$$E_t = \sum_g E_{\{g,t\}}.$$

Scenarios and Sensitivity. The projection distinguishes between two effects: the demographic effect, resulting solely from population ageing (Baseline scenario), and the intensity effect, which combines demographic change with assumed growth in per capita costs (Medium and High scenarios).

Additionally, a projection of expenditure changes under different demographic scenarios (low, medium, and high) is provided. In this case, we illustrate the impact of demographic structure assuming a 0% increase in per capita expenditure.

Sensitivity tests were conducted for the oldest age groups (80+) to verify the robustness of results against alternative aggregation methods (simple versus population-weighted averages).

For each scenario, annual public health expenditures were projected for 2024–2040.

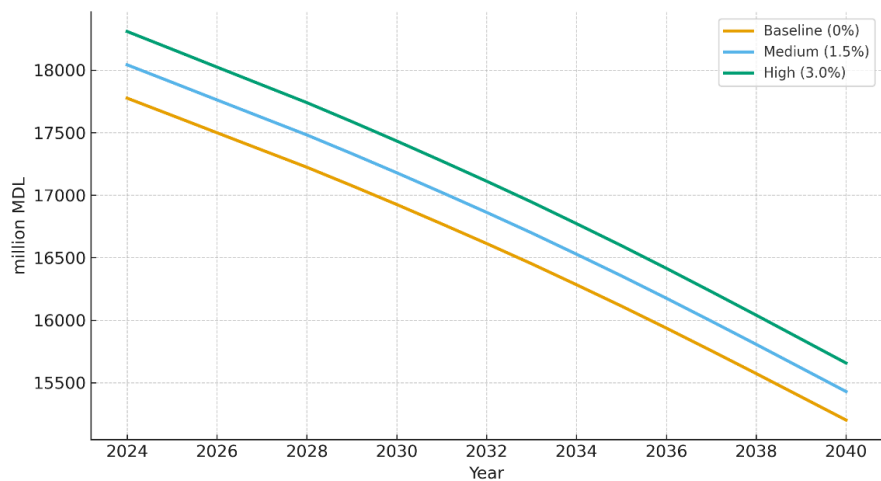
3 Results

The projection indicates a gradual decline in total public health expenditures under all scenarios from 2024 to 2040 (*Fig. 1*). This downward trend is primarily driven by the expected reduction in Moldova's total population. Even though the share of older persons in the population

continues to increase, the overall number of potential healthcare users decreases, leading to lower aggregate expenditure levels.

In the Baseline scenario, total public health expenditures fall from about 17.9 billion MDL in 2024 to roughly 15.4 billion MDL by 2040 (–14 %). This represents the pure demographic effect of population decline combined with ageing. In the Medium and High scenarios, the population reduction dominates, resulting in only a partial offset of the downward trend. Consequently, total expenditures still decrease over time but remain moderately higher than in the Baseline case.

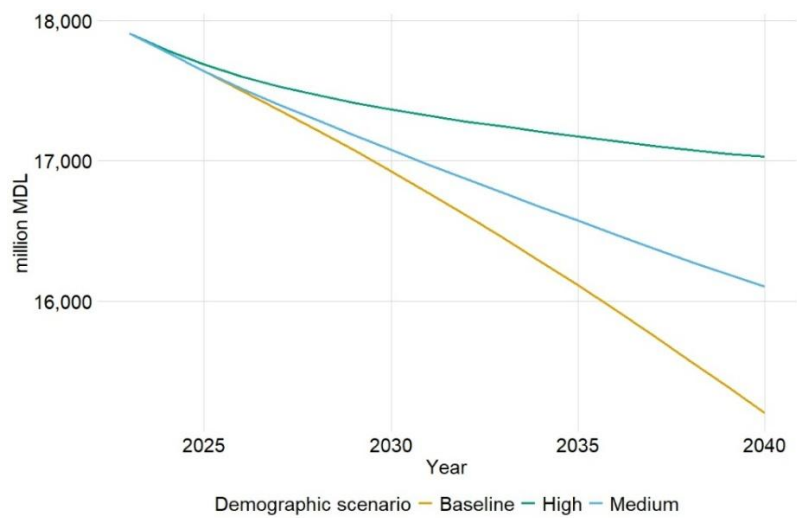
Fig. 1: Total public health expenditures, 2024–2040



Source: calculated by the authors`

The projections of total public health expenditures under different demographic scenarios (Fig. 2), assuming constant per capita health spending, show varying magnitudes of decline depending on the demographic assumptions. Under the Medium and High scenarios, which assume a significant reduction in emigration and higher life expectancy, total health expenditures are expected to be higher compared to the baseline projection. This outcome reflects the growing number of older adults in these scenarios. However, it should be noted that an increase in life expectancy also implies an extension of healthy life years. Therefore, this projection primarily illustrates the impact of the rising share of older persons on overall health expenditures.

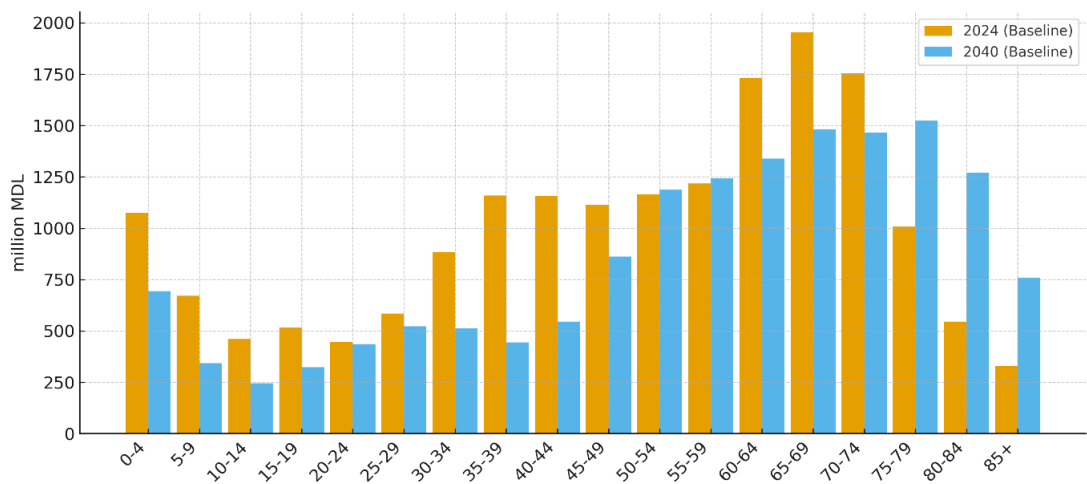
Fig. 2: Total public health expenditures under alternative demographic scenarios, 2024–2040 (0% per capita growth)



Source: calculated by the authors`

The age distribution of expenditures reveals a pronounced shift toward older age groups (*Fig. 3*). In 2024, the majority of public health spending was allocated to adults aged 45–64 and early retirees (65–74). By 2040, expenditures on people aged 70 and above are expected to expand markedly, while the relative share of spending on younger age groups (under 40) is expected to decline. The share of the 80+ group nearly doubles, reflecting both the numerical growth of this cohort and their high per capita medical costs.

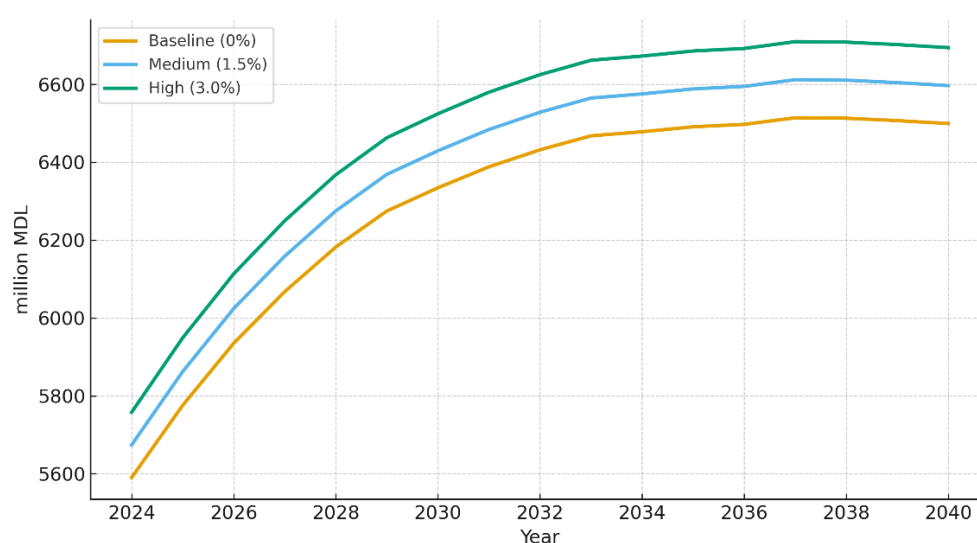
Fig. 3: Age structure of public health expenditures, 2024 and 2040 (Baseline)



Source: calculated by the authors`

Expenditures on the elderly population (65+) are projected to grow rapidly throughout the period (*Fig.4*). In the Baseline scenario, total public spending on this age group increases purely due to demographic ageing, while under the Medium and High scenarios, it rises almost exponentially, exceeding the 2024 level by 2040. This highlights that even modest annual increases in per capita spending can significantly amplify fiscal pressure over time. The steepest growth is expected to occur after 2030, when the cohorts born in the 1960s and 1970s reach retirement age.

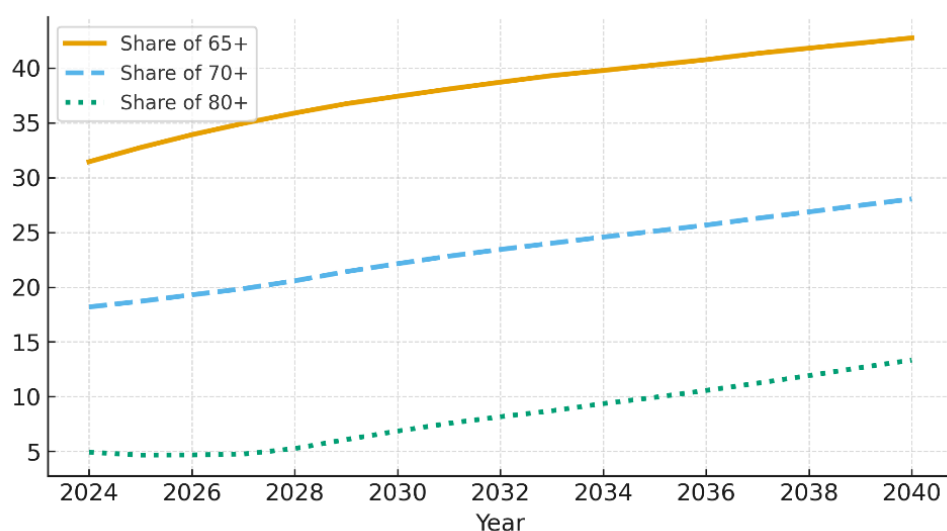
Fig. 4: Public health spending for the population at 65 years and above, 2024–2040



Source: calculated by the authors`

When examining the Baseline scenario alone, the dynamics of age-specific expenditure shares reveal a trend of progressive ageing within the older population (*Fig. 5*). The share of individuals aged 65 and above increases steadily, but the most notable growth occurs among those aged 80 and above, whose proportion in total spending rises most sharply after 2030. The newly added 70+ curve shows an intermediate trajectory, bridging the gap between these two groups. Together, these lines demonstrate that the fiscal burden is gradually shifting not only towards older adults in general but specifically towards the oldest-old, whose health needs and related costs are particularly high.

Fig. 5: Share in total public health spending for the older population, Baseline, %



Source: calculated by the authors`

Conclusions

The analysis shows that demographic ageing in Moldova will increasingly influence the structure of public health expenditures in the coming decades. Although overall spending may decrease due to population decline, the allocation of resources will shift towards older age groups, particularly those aged 80 and above.

It should be noted that Moldova still has significant potential for rapid increases in life expectancy, as current mortality levels, especially among men and in middle age, remain high (Pahomii I., 2024). If these avoidable deaths decline and population health improves, it will further accelerate the growth of the older population. This combination means that demographic ageing will intensify fiscal pressures on the health system even as health outcomes improve.

In this regard, policy adjustments that take into account both the demographic and fiscal realities of an ageing society are needed. Strengthening primary healthcare, promoting healthy ageing, and expanding long-term care services are crucial to maintaining sustainability and equity in access to medical services.

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Contact

Gagauz Olga

Centre for Demographic Research, National Institute of Economic Research,
Academy of Economic Studies of Moldova

Ion Creanga 45, MD-2064, Chisinau, Republic of Moldova

gagauz_olga@ase.md

Buciuceanu-Vrabie Mariana

Centre for Demographic Research, National Institute of Economic Research,
Academy of Economic Studies of Moldova

Ion Creanga 45, MD-2064, Chisinau, Republic of Moldova

buciuceanu_vrabie.mariana@ase.md