GLOBAL AGING IN THE PROCESS OF THE WORLD ORDER TRANSFORMATIONS

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We have devoted a number of studies to the analysis of global aging and its impact. The impact of global aging is multifaceted, and it will increase during the current century. However, not all aspects of the impact of global aging have been studied sufficiently. In particular, its impact on the political sphere has not been analysed sufficiently. The present scientific essay is aimed to demonstrate the impact of global aging on future transformations in the political sphere and the formation of a new world order.

Keywords: *global aging, retirement age, pension system, adaptation to aging society, demography, world order. Global South, Global North.*

1. Global Aging as One of the Leading Trends of the Twenty-First Century. Problems and Opportunities in Social, Economic and Technological Terms

Global aging is an exceptionally important and powerful factor in the current transformation of the society. Global aging has an impact on almost all spheres of life, and its influence will grow over the many decades to come. However, even in academic journals and publications, it is little spoken about, especially with regard to its broad impact on all spheres of society. [1]

When analyzing the impact of global aging in the future, the most important question is, of course, how far this process will go and, above all, what will be the share of elderly and old people in the demographic structure of society. We present some estimated forecasts below. The actual course of the aging process in society will greatly affect the following aspects: (a) economic (labor recruitment, consumption and its structure, growth rates, investments, *etc*.); (b) political (*e.g.,* will older people be the leading electoral layer? What part of the budgets will be allocated to them?); (c) social (to what extent will social programs and the professional structure be oriented towards them and what will be the development of social science); and (d) growing problems in pension systems, which will become extremely acute in the future and require retirement-age increase.

In any case, the social and political structures will be affected by the growing influence of different age groups in the population. The influence of aging on democracy cannot be ruled out (see Grinin L., Grinin A., and Korotayev 2024 for more details).

Recommended citation: Grinin, A. Global Aging in the Process of the World Order Transformations. *Journal of Globalization Studies*, Vol. 16 No. 1, May 2025, pp. 181–192. DOI: 10.30884/jogs/2025.01.13.

Forecasts about the aging of societies become more alarming every year. Against the background of falling birth rates and fewer children, more and more societies are becoming older. One of the obvious consequences will be a crisis in the pension systems (the problems of which are already perceived very acutely in several countries), leading to an increase in the retirement age and corresponding conflicts in society. However, modern society is generally unprepared for such changes and adaptations, and the development of these trends can lead to serious tensions and conflicts. Therefore, such a development in society will inevitably require significant changes in institutionalization of these adaptations and changes. So the problems of modern and future global aging are extremely diverse.

The number of people aged 60 years and over already exceeds the number of children under five (WHO 2021). The dimensions of global aging are many and will continue to increase, and the challenges are likely to become more acute for at least the next two to three decades.

The aging projections, even the inertial ones, are quite impressive. All demographic forecasts agree that the world population will age dramatically in the coming decades (Lutz *et al*. 2018; Vollset *et al*. 2020; Grinin L., Grinin A., and Korotayev 2024; UN Population Division 2024; Wittgenstein Center 2024); see Figures 1 and 2, and Table 1.

The growth rate of the proportion of people aged 60+ is several times higher than the overall growth rate of the world's population (UN 2013; UN Population Division 2024). In the early 1980s, there were no 'aged countries' in the world, where older people consumed more than young people. By 2010, there were already 23 'aged countries,' and by 2040 there will be 89 such countries (UNCTAD 2012), most likely even more, as the projection was made a long time ago. By 2100, 2.37 billion people, or more than a quarter of the world's population, will be over 65 years of age, and only 1.70 billion people will be under 20. The number of people aged 80 years and over will increase six fold, from about 140 million in 2017 to more than 860 million by the end of the twenty-first century (Gallagher 2020); thus, the number of people aged 80 and over is likely to increase by almost two orders of magnitude by 2100 compared with 1950! (see Figure 1)

In developed societies, the elderly begin to replace children in terms of care they need. But caring for the elderly requires more resources and efforts from society, even though the main responsibility still lies with the family and relatives.

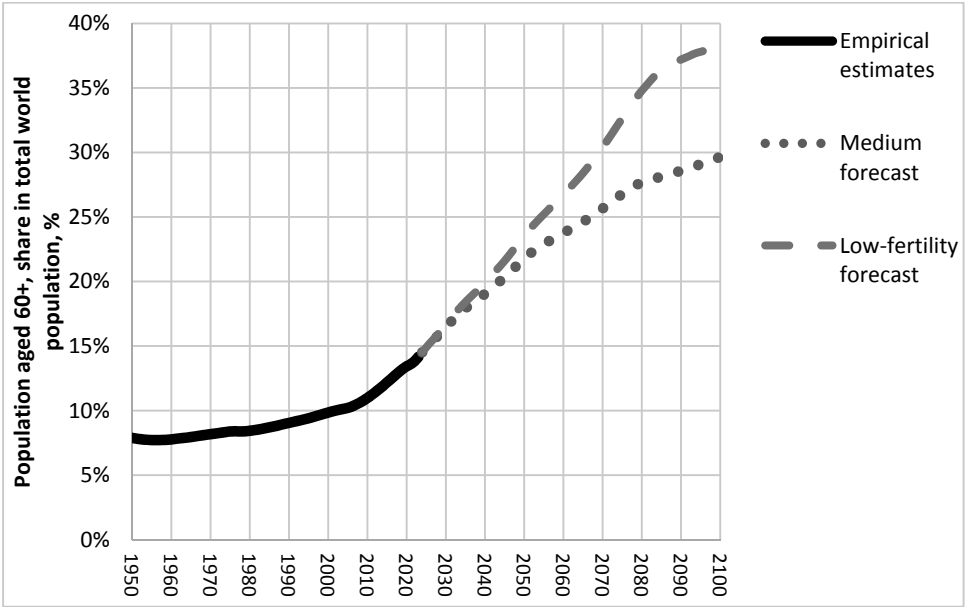

Fig. 1. Population aged 60+, share in total world population (%); UN Population Division empirical estimates for 1950–2023 and UN Population Division medium + low-fertility forecast scenarios for 2024–2100

Data source: UN Population Division 2024.

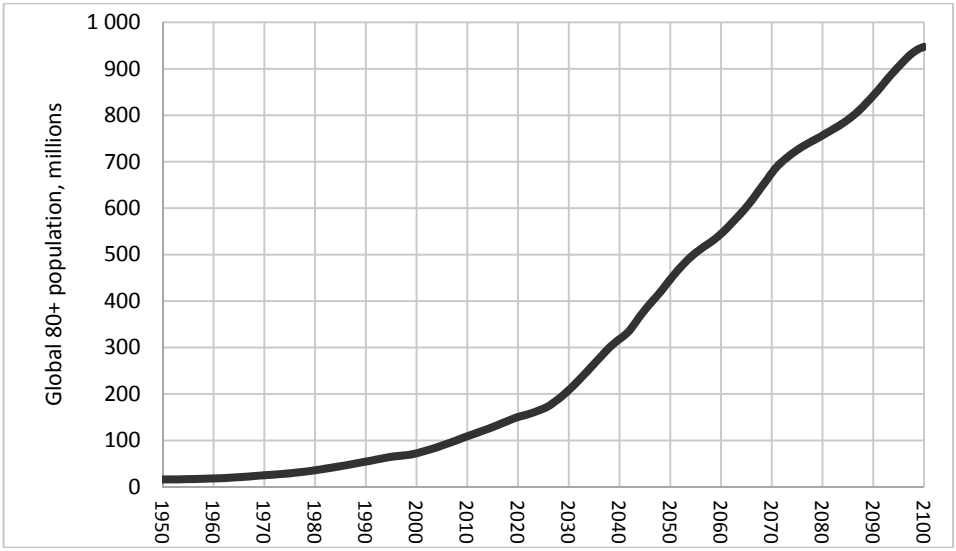

Fig. 2. Global population aged 80+, millions; UN Population Division empirical estimates for 1950–2023 and UN Population Division medium forecast scenario for 2024–2100

Data source: UN Population Division 2024.

Table 1

Some dimensions of global aging

	Population aged 60+, share in total world population (%). Empirical estimates	*Population aged 60+, share in total world population (%). Medium forecast*	*Global population aged 80+, millions. Empirical estimates*
1950	7.88 %		16.03
1975	8.38 %		29.32
2000	9.84 %		72.38
2023	14.16 %		160.12
	Low-fertility forecast		*Forecast*
2050	23.54 %	21.78 %	446.47
2075	32.66 %	26.79 %	724.98
2100	38.31 %	29.66 %	947.29

Data source: UN Population Division 2024.

Such alarming forecasts should make politicians think twice and start changing course. However, many do not consider this situation as serious enough and do not understand the urgency in solving the problem and the complexity of measures that could slow down, if not reverse, the trend (see, *e.g.*, Gallagher 2020). We believe that if the processes of global aging and increasing life expectancy continue, they will bring about very serious changes in socio-political life. However, modern society is generally not prepared for such changes and adaptations, and the continuation of these trends could lead to serious tensions and conflicts. Therefore, such development in society will inevitably require significant changes in the institutionalization of age categories (see also Grinin, Grinin, and Korotayev 2024; see also Goldstone 2025 in this volume).

Thus, the process of global aging turns out to be truly integral, and it is important to pay as much attention to it as possible. And the sooner, the better for the future of the world.

2. The Impact of Global Aging on the Transformation of World Order

The influence of the demographic factors on changes in the world order and the struggle for a new world order varies (for more details see Grinin 2025a, 2025b). Demographic changes are long-term and fundamental, radically and usually resulting in irreversible changes in the characteristics and capabilities of certain countries and actors.

The demographic factor is extremely important both nationally and globally. This becomes clear when we take into account the sharp decline in birth rates in the Western world and even in Asia and Latin America, and its high growth in Africa, as well as the rapid process of global population aging. These processes affect many aspects of life. In particular, migrants significantly affect Europe and North America.

Global aging is one of the most significant demographic trends of our time. Together with declining birth rates, it has a powerful impact on political systems and the global balance of power. In particular, the demographic growth in developing countries (the Global South) and demographic stagnation or depopulation (or even growth due to migration) in Western countries will gradually change the global balance of power, and

thus, accelerate the change in the world order. Even more importantly, the demographic weight of the Global South, combined with economic growth and increased political activity, can produce a synergistic effect. The impact of aging on labor shortages and the increasing demand for technologies that reduce human labor and manpower participation in military processes is undoubtedly significant and will greatly change the global balance of power. In the next section, we will consider the impact of aging on armed forces staffing.

3. Aging, Depopulation and Military Recruitment

There is an increasing difficulty in attracting new recruits to the armed forces in many countries. Ukraine and the Russian Federation are currently facing these challenges more acutely. And it is not only a matter of the limited number of volunteers willing to serve in the military, it is also a fact that the number of young people is decreasing.

Researchers note that population aging in the United States and its traditionally allied countries will reduce their ability to ensure national and global security. And this, along with population decline and a potential decline in GDP in many developed countries, will greatly affect the decline of the developed world (Jackson *et al*. 2008; see also: Jackson *et al.* 2013; Jackson 2021; Grinin and Korotayev 2015; Grinin L., Grinin A., and Korotayev 2023a). In particular, Jackson *et al*. (2008) note that, along with a decline in population and GDP, the global influence of developed countries will most likely decline as well.

Aging developed countries will face a chronic shortage of young personnel, which will pose challenges to both their economies and their security forces. This reduction in the youth population leads to major difficulties in recruiting for the army, navy, and air force (see, *e.g*., Clark 2024; Venable 2023; Grygiel 2024; Weichert 2024; Suciu 2024). The British Army has failed to meet its recruitment targets at all its recruitment centres over the past five years. France also missed its targets last year, falling short by about 2,000 recruits (Laurent 2024). Japan missed its 2023 target by half (Goldman 2024). Meanwhile, due to the US Pacific strategy, the intensifying confrontation between the US and China, and the desire to encircle China with its own and allied forces, Japan is seeking to build up its self-defense forces (which are already developing into a conventional army). Of course, this will be extremely challenging.

Analysts have reached the somewhat controversial but not entirely unreasonable conclusion that there is a close relationship between fertility and morale among the industrialized world (Goldman 2024); smaller family sizes may reduce the willingness to take risks by sending young men to war (Jackson *et al*. 2008). We believe this to be at least partly true. After all, it is more difficult to send one child to war than it is to send four or five. And if the number of childless families continues to grow, and it grows quite quickly, more and more older men and an ever-increasing number of women must go to military service and war. All this does not contribute to a high military-patriotic spirit. The shortage of military personnel forces commanders to be more liberal with them, which weakens military discipline and order – the basis of any army. In addition, the shortage of personnel, together with the so-called ‘critical race theory’ and ‘practice of inclusion,’ whereby representatives of various minorities are selected according to a quota, lead to a sharp decline in qualifications. In particular, the US Navy destroyed

four ships in 2017 alone. In 2022, an F-18 Super Hornet fighter jet worth $67 million was literally swept off the deck of an aircraft carrier. And these personnel shortages and the resulting incompetence affect not only the Navy, but all other branches of the armed forces (Anton 2023). Thus, depopulation greatly affects the military's potential power.

Therefore, there is a strong demand for labor-saving technologies in general. And this applies to an even greater extent to military technologies that can reduce the need for manpower, that is, 'unmanned' technologies. We have examined in detail the development of such 'unmanned' military systems of UAVs and other (land and water) drones, as well as combat robots (see Grinin A. 2025b). As we have seen, in the long term this will lead to a war between self-managing systems with a minimum number of living military personnel, as well as to the coexistence of humans and robots. It is clear that Western countries and the Russian Federation can maintain their high positions in the global balance of power in the future if only they can move in the direction of saving human labor and reducing the number of military personnel on the combat contact line by developing 'unmanned' technologies. But even in this case, the lack of demographic reserves for mobilization would significantly reduce the country's combat potential. The conflict in Ukraine already demonstrates how difficult it is to put large masses of soldiers under arms, despite Russia having deployed millions in previous world wars. Thus, the lack of mobilization resources could affect geopolitical positions.

Another important aspect relates to depopulation, aging and the development of medical technologies. Replacing manpower with low-manpower technologies in the combat zone means saving/reducing the need for physically healthy and non-elderly military personnel. However, the number of people involved in combat operations behind the front line can be significant. So it is important that people who are less physically healthy and older, including the disabled, and who are able to work with remote technologies, can be involved. This means that development can proceed by reducing not only the need for military personnel on the front line, but also by reducing the need for physically healthy and relatively young people, by involving older people and people with disabilities, who can carry out actions with the help of medical and other technologies, particularly cognitive ones.

4. Socio-Demographic Scenarios

Thus, the processes of aging and depopulation in the countries of the Global North will objectively change technologies and strategies in the economic field, with a focus on developing labor-saving technologies; and in the military field – in the direction of the large-scale development of unmanned military technologies. And these processes will greatly change the balance of power and the forms of struggle for a new world order.

As a result of the aging and depopulation of developed and other countries, the danger of the formation of a new balance of power and its influence on the world order is increasing, which is often referred to as a potential global confrontation, or even a struggle, between the young South and the aging North.

Below are several scenarios for the development of the World System in relation to the potential demographic trends described in Grinin *et al*. (2024: Ch. 7). Russia is also among the countries where depopulation has begun, and this is a very serious and growing vulnerability in the intensifying struggle for a new world order. The scenarios depend on the balance of power in the world, as well as on the relationship between political forces supporting conservative-patriotic values and globalism. And aging will affect

this ratio. Of course, the scenarios outlined are just tendencies that could never manifest themselves in their full form, but these scenarios show possible tendencies and their interaction and combinations of which will ultimately create a new alignment of forces and balance. It is not possible to discuss these scenarios and their likelihood in detail.

Scenario one: The senility and decline of the developed world and the emergence of new actors on the scene. This scenario refers to the possibility of the World System division into a 'young South' and an 'aging North,' provided that the latter fails to cope with the consequences of global aging while the former develops major leaders capable of changing the balance of power (primarily India).

Scenario two: Young countries invigorate the World System. It is possible that, if the foundations of the world order secure some of the advantages of the rising countries, this could temporarily invigorate to the whole World System. However, this dynamism will be exhausted by the end of the century.

Scenario three: Global conservatism. However, if the world order is strengthened with developed countries at the top, conservatism may start to spread to younger countries (such ideas are already articulated today: no need for growth, etc.; for details see Grinin L. and Grinin A. 2021a, 2021b). At the same time, as noted by Jackson *et al.* (2008), an aging developed world may struggle to remain culturally attractive and politically relevant to younger societies.

Scenario four: Activity despite aging as a national policy. However, the struggle for a new world order in the situation of depopulation and aging in the developed world, could lead to a certain rise in the aging countries of the developed world. Older countries will be forced to become more active and increase their birth rates, which could give an impetus to the development of new reproduction-related technologies. [2]

Scenario five: agist globalization. Capital and corporations are increasingly involving young and mature generations in less developed countries, raising their standards of living while thus providing for the older generation in their own countries (see Grinin and Korotayev 2010). This will clearly enhance globalization. Zones of influence related to language, traditions and geopolitics will emerge based on remote work (see in particular Grinin, Malkov, and Korotayev 2023; Grinin, Malkov *et al.* 2024).

Let me emphasize that these are all scenarios for the next 50 years. By the end of the century, the situation will change significantly as older countries adapt to aging, and the younger countries will no longer be so young. Cybernetic society will be established (see Grinin L., Grinin A., and Korotayev 2024: Ch. 15). In this context, other scenarios are possible, such as a consensus on an aging world or the dominance of new actors.

5. Political-Technological Scenario

Another scenario, as well as the following forecast, has been calculated for the period up to the end of the current century, although many of their features may appear much earlier, especially with respect to the electronic state. However, these scenarios do not exclude the previous ones.

Scenario 6. The emergence of an electronic state resulting from the powerful development of socio-technical self-regulated systems.

During the Cybernetic Revolution, many self-regulated systems will emerge in production, economy and everyday life.[3] Among these systems, socio-technical self-

regulated systems (SSS) will play a special role, using Artificial Intelligence to regulate various social and administrative relations. Socio-technical self-regulated systems (SSS) perform social and administrative functions (*i.e*. control, verification, distribution, security, rating and other functions) using a set of technologies with the minimal or no human intervention of officials and specialists. Thus, they can be used by authorities at different levels, as well as by the state as a whole, and by the administration of service centers where such regulation is considered by the authorities as necessary: airports, places of mass gatherings, *etc*.).

In the *political* and *administrative* sphere, significant, one might say revolutionary, changes in governance will occur in connection with the development of self-managing systems, since these systems will manage many social and administrative relations. This will happen at the level of individual administrative units and cities (the so-called smart cities), as well as at the level of the state as a whole. In other words, the development of the SSS in one way or another pushes society towards the formation of what we call an e-state. However, there are important points to emphasize. We understand the e-state to be a state with a significantly reduced number of civil servants and the supervisory bodies we are accustomed to, due to the fact that many management functions will be carried out mainly, and somewhere completely, with the help of SSS technologies (see Grinin L., Grinin A., and Korotayev 2021a, 2024). This could also affect democratic procedures (see below).

Thus, there will be a sharp reduction in the number of officials and managers, which will lead to a 'cheapening' of the state and a reduction in the drawbacks associated with management (corruption, bureaucracy, *etc*.). However, this will also create a number of problems. On the one hand, the development of socio-technical self-regulating systems makes a transition to direct democracy through permanent electronic voting quite possible. Yet, on the other hand, the use of self-regulating systems in governance will lead to increased technological and political control. We assume that as a result, a unique political regime will emerge, a kind of *democratic authoritarianism*.

Such changes can bring about enormous transformations in states' domestic and foreign policies, and changes in the leading geopolitical actors will inevitably lead to serious and as yet not entirely clear, changes in the struggle for a new world order.

6. Final Forecast Related to the Process of Global Aging: The Formation of a Cybernetic Society

In our opinion, as a result of the largely symbiotic development of the process of global aging and the adaptation of society to it, on the one hand, and the powerful development of self-regulating/managing systems, on the other hand, a new type of society will emerge – a cybernetic society. This society will be formed as a result of the completion of the Cybernetic Revolution and will be: a) super-technological; b) socio-technologically regulated at all levels; and c) a society in which the division into age categories will become socially much more significant, as a result of the aging process, than today (*i.e*., age will become a much more important social marker than it is today). A cybernetic society is a society that will emerge (and is already emerging) as a result of the completion of the Cybernetic Revolution. On the one hand, it will be closely linked with crucial technological changes in the management and regulation of our life activities at all levels. And on the other hand, it is inextricably linked with the process

of global aging, because aging becomes an integral part of society. As it develops and the institutions of society adapt to it, it will change all spheres of society: technological, economic, consumption, social, ideological, and so on. The main characteristics of this society are outlined in Grinin L., Grinin A., and Korotayev 2024: ch. 15.

However, technological development not only brings relief in a number of aspects, but also threatens the freedom, dignity and privacy of individuals and their comfort. This is especially true for the elderly, who are particularly vulnerable from psychological point of view. Therefore, adapting to aging requires the adaptation of technological innovations to the principles of a free society. And this is a serious problem to be solved, which is already felt very clearly today and is already causing social protests.

In conclusion, we emphasize that in the future it will be impossible to cope with the global aging process without development of innovative technologies in medicine, biotechnology, *etc.*, including self-regulating and other systems (see Grinin L., Grinin A., and Korotayev 2023b; 2024; Grinin L., Grinin A., and Malkov 2023), as well as without profound changes in society, including social innovations deeply integrated into public life.

Funding

The research has been supported by the Russian Science Foundation (Project No 23-18-00535 'The Struggle for a New World Order and the Strengthening of Destabilization Processes in the World System').

NOTES

[1] We have devoted a number of studies to this topic: Grinin L., Korotayev 2016; Grinin L., Grinin A., Korotayev 2017a; 2023b; 2023c; 2024; Grinin L., Grinin A., Malkov 2023.

[2] New breakthroughs in reproductive technologies may have a significant impact and could become a weapon in geopolitical and other struggles. For example, if the technology enabling children to be grown outside the womb is implemented, the demographic structure could change significantly over time. In particular, it could lead to a rejuvenation of the population structure in aging societies. The development of reproductive technologies could lead to changes in politics and geopolitics. In particular, some political elites may be able in the future to use such reproductive technologies for their own geopolitical purposes. For example, they may launch a population growth race. Moreover, if countries seek to solve the problem of population decline by 'incubating' children in artificial wombs, the 'child production' race will inevitably start. And it is difficult to predict the consequences which may be quite problematic in many ways (see, *e.g.,* Grinin L., Grinin A. 2015: Conclusion), but they could also have a noticeable geopolitical effect (see Grinin L., Grinin A. 2016; Grinin L. *et al*. 2024).

[3] The Cybernetic Revolution (1950s–2070s) is a fundamental transition from the industrial production principle to the production of services and goods based on the widespread introduction of self-regulating systems, that is, systems capable of not only functioning independently (or with minimal participation) of people, but also independently making complex decisions (see Grinin L., Grinin A. 2016, 2019a, 2019b, 2019c, 2020a, 2020b, 2021b,; Grinin L. *et al.* 2017a; 2017b; 2020; 2021b, 2024; Grinin L., Korotayev 2015).

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