

The Demographic Sustainability of Ukraine: The Historical Retrospective and the Current Challenges

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Abstract

This paper addresses the changes in the demographic development of Ukraine in the last 125 years in quantitative parameters of demographic sustainability: alterations in population size, its gender and age structure, and natural and migration movement. Demographic sustainability is considered to be the capacity of a country's or a region's demography to preserve a consistent population size with optimal proportions between its age categories. Eight historical-demographic stages related to specific military-political and socio-economic events are outlined and analysed. Demographic catastrophes and crises in Ukraine were directly related to the aggression of totalitarian regimes. They occurred at the initial stages of demographic transition, so Ukraine was capable of restoring the population size, albeit with deeply disturbed demographic structures. The large-scale Russian invasion of Ukraine increases the risk of the occurrence of a modern demographic catastrophe. Nowadays, the demographic sustainability of Ukraine cannot be achieved autonomously without the positive impact of external factors – the respective governmental demographic and socio-economic policies.

Keywords

demographic sustainability, Ukraine, gender-age structure of the population, natural population movement, migration, demographic catastrophe

Introduction

The large-scale Russian invasion of Ukraine on 24th February, 2022, is the largest war in Europe since World War II, which has jeopardised the existence of the state of Ukraine and caused numerous human and material losses. Thousands of killed and injured among Ukrainian civilians and soldiers, millions of refugees and displaced persons, destruction of cities, villages, and infrastructure, seizure of settlements, kidnapping, atrocities upon humans, and looting are just a few war crimes of the Russian Federation in Ukraine.

Ukraine is heading for a demographic catastrophe – another one caused by the criminal policy of the Kremlin. Ukraine survived a range of similar catastrophes and comparatively smaller demographic crises by their consequences directly related to the aggression of totalitarian regimes in the 20th century. The largest of them include World War I, the destruction of Ukraine's statehood, and violent military establishment of the totalitarian communist regime in 1919–1921, the man-made mass famine of 1921–1923, the Holodomor Genocide of 1932–1933, World War II, mass deportations, and man-made mass famine of 1946–1947. They all have resulted in the millions of destroyed human lives in Ukraine: dead, jailed, missing, forcibly displaced outside the 'republic', etc. Moreover, it is worth taking into account those unborn in the next generations. According to O. Hladun (2018, p. 193), the population of modern Ukraine would have been 74.6 million (as of 1st January, 2014) if there had not been for those demographic catastrophes in the 20th century.

The article aims to analyse the main demographic reproduction parameters of demographic sustainability in Ukraine in the last 125 years and assess the capacity of its maintenance in modern Ukraine.

The retrospective analysis of demographic development in Ukraine from the viewpoint of changing main demographic sustainability indicators helps determine the major stages of demographic reproduction in Ukraine and understand the scale of demographic structure deformation. It will contribute to the construction of new demographic development models in Ukraine and its regions,

as well as the elaboration and implementation of the mechanisms to secure demographic sustainability.

Theoretical setting and literature review

In a general sense, sustainability can be interpreted as an ability to be maintained at a certain rate or level. The concept of stability borrowed from natural sciences is similar by its content, meaning 'the consistent condition, the ability of the long-term existence and preservation in time'. The concept of 'stable population' was first introduced into demography by Lotka (1939) as a particular case of the so-called 'Malthusian population'. Lotka demonstrated that a stable population can be considered as a limit state that the territorial community is seeking with unchanging mortality and fertility.

Another approach to a system sustainability assessment stems from the foundations of the sustainable development concept. The sustainable development concept (United Nations, 1992) stipulates the development of the long-term equilibrium of three subsystems – environmental, economic, and social. Since the population is the most important element in the functioning of social and economic domains in any area, demographic sustainability should be considered as an essential sustainable development parameter.

However, the interpretation of demographic sustainability is very reduced in this approach, i.e. as only one dimension of social sustainability (Thomson and Snadden, 2002). Since the population is essential for the functioning of society and economy of any geographic area, demographic sustainability should be considered also as one of the subsystems in the sustainability system (Lutz et al., 2002). Yet, demographic sustainability often is regarded quite narrowly, i.e. only from the viewpoint of the growing population and age-gender structure. Therefore, various authors (Sleeboos, 2003; Mamolo and Billari, 2003) define demographic sustainability as the maintenance of consistent population size that can secure at least a simple reproduction (actually equaling sustainability and stability). Other authors reduce the concept of demographic sustainability to the ratio between the working-age and post-active population, or understand it as the numerical balance between genders. However, demographic sustainability should also include socio-economic factors of the population (Lutz et al., 2002).

Roca and Leitão (2005, p. 183) define sustainability as a well-balanced system of interacting environmental, economic, social, and demographic components. When analysing the demographic component of sustainability, the authors understand the population as the structural framework of economy and society in any area, in such a way defining it as the key element of sustainable spatial development. Nepytyaliuk (2018) shows the nature and value of demographic sustainability in globalisation substantiates demographic sustainability as the foundation of endogenous economic growth.

Liddle (2002) argues that not every society can be demographically-sustainable, but only the one which maintains in a long run its vitality and functionality in the context of producing labour (overall) and human/intellectual capital (in particular), and one achieving the planned/desired production parameters.

Therefore, in its narrow sense, demographic sustainability should be interpreted as the maintenance of the consistent population size secured by its simple reproduction. In this regard, it is characterised by the parameters of population dynamics and changes in its age-gender structure (in particular, the ratio of the shares of the working-age and post-active population), i.e. it comes to the so-called stationary population.

On a wider scale, demographic sustainability can be defined as the capacity of a country to maintain the consistent population size with optimal proportions between its age categories and a balanced socio-economic society structure. Meanwhile, sustainability also means the capacity to withstand external and internal factors of demographic situation and the ability to return to the initial balanced condition (or acquire a new equilibrium condition).

Following contemporary approaches (Roca and Leitão, 2005; Roca and Roca, 2014), the demographic sustainability of a region can be regarded in two dimensions: demographic and socio-economic. In the first case, demographic sustainability is the equilibrium between large age groups,

i.e. when there is an optimal ratio of these two groups by their size and growth. Therefore, from the viewpoint of demographic reproduction parameters, an area is demographically-sustainable when it maintains the optimal ratio of the population size (natural growth and migration) and age groups' growth paces. A country is demographically-sustainable from the viewpoint of socio-economic dimension if it has a balanced socio-economic structure of the population (characteristics of economic activity, professional structure, education, national and religious composition, stratification of the population, regional structure, distribution of the population by the sources of livelihood, the Gini coefficient, etc.)

Taking into account the above-mentioned, demographic sustainability is the condition of demography that secures the continuous recovery of quantitative and qualitative demographic structures in the respective historical and socio-economic conditions, and that characterises its capacity to return to equilibrium or acquire new quantitative and qualitative parameters. Stabilisation or moderate growth of population size is the condition of sustainable development in Ukraine.

Demographic changes in Ukrainian territories from the late 19th century till the 1920s are addressed by scientific and analytical studies of demographers, statisticians, and historians. The analysis of changes in size and composition of the Ukrainian population in the country's ethnographic boundaries in 1897–1914 shows consistent growth in the population size of Ukrainian territories (Rudnyckyj, 1916; Korduba, 1918; Rashyn, 1956). Their overpopulation was causing high emigration levels both within the respective empire and beyond its boundaries (Yamzin and Voshchinin, 1926; Hirschfeld, 1930; Kabuzan, 2005). A more comprehensive analysis of the natural movement of the population and changes in the age-gender structure based on censuses of 1897 and 1926 indicated the traditional type of population reproduction and its deformation due to World War I, 'red terror', and mass man-made famine of 1921–1923 (Khomenko, 1927; Dramaretskyi, 2021; Laver, 2005).

Since the early 1930s, the demographic science in Ukrainian SSR has been almost completely destroyed and the demographic statistics have been often distorted to conceal the scale of crimes committed by the totalitarian regime. The Holodomor Genocide of 1932–1933 brought multimillion demographic losses, significantly distorted the age-gender composition of the population, and caused the birth rate to drop (Die Bevölkerungsdynamik der Ukraine in den Jahren 1917–1941, 1942; Vallin et al., 2002; Rudnytskyi et al., 2015; Marochko, 2017; Serhiychuk, 2018). After the USSR archives had been opened, the data in Soviet censuses of 1937 and 1939 were critically reviewed, and the proof of the unreliability of some demographic statistics sources was found (Andreev et al., 1993; Tolts, 1995; Zhiromskaya et al., 1996; Serhiychuk, 2018).

World War II stroke demographic sustainability of Ukraine no less ruthlessly and was reinforced by further repressions of the totalitarian regime, mass man-made famine of 1946–1947, and the fight against the Ukrainian underground (Herasymov et al., 2000; Lysenko and Perekhrest, 2015).

Overall, a range of military-political and socio-economic factors were the main demographic development determinants in Ukraine in the period under research, causing the change of main demographic sustainability parameters (Kubiyovych and Kuzelia, 1949; Kubiyovych, 1959; Kulchytskyi, 2004; Hladun, 2018; Hladun et al., 2020).

The existing modern demographic projections made before the invasion on 24th February, 2022, show a consistent drop in the Ukrainian population size and further possible changes in its age structure (Population of Ukraine, 2022a; United Nations, 2022).

Methodology and dataset

The research contains the results of the analysis of the change in the main absolute and relative demographic sustainability parameters in Ukraine in the last 125 years (1897–2022) in the process of demographic development in relation to specific military-political and socio-economic events. These parameters characterise the change in the population size, the transformation of its age-gender structure, natural reproduction of the population, and migration in the determined historical-demographic periods.

Historical-demographic periodisation. The time framework of the research was conditionally divided into 8 periods for the benefit of the analysis. Each has peculiar historical-political and

socio-economic conditions that determine the indicated demographic sustainability parameters in Ukraine. Overall, Ukraine faced three large-scale demographic catastrophes in the period under research (World War I and violent establishment of the 1914–1923 totalitarian regime, Holodomor Genocide of 1932–1933, and World War II and mass repressions of 1939–1947) and several demographic crises, the last of which aggravated with the beginning of the full-scale Russian invasion of Ukraine.

Territory. The research analyses demographic changes in the Ukrainian territory within its current borders (603,700 sq. km). At the turn of 19th and 20th centuries and up to the 1930s–1940s, Ukrainians were settled also beyond the borders of modern Ukraine. According to official censuses in the Russian (1897) and Austro-Hungarian (1900) Empires, Ukrainians accounted for the majority in many areas that currently are the territories of neighbouring states: Russia, Belarus, Poland, Slovakia, Romania, and Moldova. With regard to demographic processes occurring in other Ukrainian ethnical lands before World War II, they are indicated separately.

After the Empires had collapsed, Ukrainian states were created: the Ukrainian People's Republic in Ukrainian ethnic lands of the Russian Empire (1917) and the West Ukrainian People's Republic in the Austro-Hungarian Empire (1918). Yet, the existence of Ukrainian statehood in the early 20th century was brief (till 1921), and due to wars and respective political decisions, Ukrainian ethnic lands eventually turned out to be under the domination of different states again (USSR, Poland, Czechoslovakia, and Romania), where they either constituted individual administrative entities or their parts were included in larger entities. After World War II, USSR gradually concentrated most Ukrainian lands under its puppet Ukrainian SSR. Ukrainian population of the rest of the territories had been denationalised during the 20th century (North Caucasus Krai of the Russian Soviet Federative Socialist Republic), deported (USSR, Polish Republic), and partially or completely assimilated (Byelorussian Soviet Socialist Republic, Russian Soviet Federative Socialist Republic, Moldavian Soviet Socialist Republic, Socialist Republic of Romania, and Czechoslovakia). Ukrainian territory was shaped the way it currently is in 1954 when the Crimean oblast was included in the Ukrainian SSR.

Source base. Official censuses data are the main sources for the analysis. The first and the last census in the Russian Empire was held in 1897 (Demoscope Weekly, 2022). Back then, Ukrainian lands included 9 governorates and, additionally, some parts of integrated Ukrainian ethnical territory were included in the other 7 governorates and 2 oblasts of the Empire. The censuses were held in the Austro-Hungarian Empire in 1900 (Österreichischen Nationalbibliothek, 2022a) and 1910 (Österreichischen Nationalbibliothek, 2022b), recording the residents of other Ukrainian lands: Eastern Halychyna, Zakarpattya, Northern Bukovyna.

The first census in the USSR was in 1926 (Office central de statistique de l'U.R.S.S., 1929). Back then, most Ukrainian territories that were part of the Ukrainian People's Republic and Ukrainian State in 1917–1921 constituted the so-called Ukrainian Socialist Soviet Republic¹. It included border areas of Slobozhanshchyna, Podonnya, Crimea, and the Ukrainian ethnical lands of North Caucasus Krai. The population in the territory of contemporary western Ukrainian oblasts and other areas with a prevailing Ukrainian population was recorded by the Second Census of the Polish Population in 1931 (Centralna Biblioteka Statystyczna, 2022) (Eastern Halychyna, Volyn, Polissya, Holmshchyna, and Podlasie), General Census of the Romanian Population in 1930 (Institutul Central de Statistică, 2022) (Northern Bukovyna), and Czechoslovakian Census in 1930 (Český statistický úřad, 2022) (Zakarpattya).

The next census in the USSR was held in 1937 (Zhiromskaya et al., 1996). Immediately after it had been finished, its quality was recognised as extremely unsatisfactory, and its results were not processed and disclosed in the Soviet times. The cause was the inconsistency of obtained results with Stalin's expectations. The census showed a significant drop in the population size of the Ukrainian SSR – by 630,600 people compared to the results of the 1926 census, revealing the consequences of the criminal policy of the Kremlin – violent collectivisation, deportation, Holodomor, and repressions.

¹ Ukrainian Soviet Socialist Republic from 1937.

Instead of the repressed census of 1937, the All-Union Census of 1939 was held and was regarded as exemplary in Soviet times. However, the later analysis of the Census data indicates the data falsification and manipulation (Central Statistical Office of the USSR State Planning Committee, 1941; Tolts, 1995; Serhiychuk, 2018; Seventeen Moments in Soviet History, 2022; Historical materials, 2022).

The rest of the USSR censuses – in 1959, 1970, 1979, 1989, and current demographic data record the population of Ukraine in its contemporary boundaries (USSR State Statistical Committee, 1988). The first and last so far All-Ukrainian Census was in 2001 (State Statistics Service of Ukraine, 2022). The next one was supposed to be held in 2011, but after numerous delays, it is currently scheduled for 2023.

The Population of Ukraine website provides current demographic statistics data on Ukraine from 1989 (Population of Ukraine, 2022). Since Ukrainian statistics are lacking, the research is based on the data of illegal Russian census in the occupied Crimea (Crimeainform, 2022). The UN website offers the generalised data on the size and natural movement of the population since the 1950s (United Nations, 2022), and the UN Refugee Agency website gives the analysis of forced external and internal migration (The UN Refugee Agency, 2022).

Findings and Discussion

Stage 1. 1897–1913. Pre-World War I. As of 1897, the population size in all Ukrainian lands was 35.8 million. By 1914, it increased to 47.1 million. Very quick paces of population growth were peculiar to Ukrainian governorates included in the Russian Empire, where it grew by 9.2 million or 39.3% in 1897–1914 (in Katerynoslav governorate – by 63.5%). The population in Halychyna and Bukovyna (within then-administrative units, i.e. with modern parts of Poland and Romania) was growing slower – by 9.7% in 10 years between the censuses (1900–1910).

These parameters were the consequence of mainly high birth rate and, as a consequence, significant natural population growth. The birth rate in Russian Ukraine was gradually reducing in 1897–1913 from 48‰ to 41‰, while the mortality rate – from 27‰ to 22‰. Therefore, natural growth reduced from 21‰ to 19‰. The birth rate in Austrian Ukraine was somewhat lower in the same period (from 46‰ to 40‰), while mortality was higher (31‰–26‰). Natural growth ranged within 14–15‰.

The gender composition was 1,008 females per 1,000 males. The age structure of the population corresponded to the progressive reproduction type – a substantial surplus of the share of children over the share of older adults. This reproduction type was peculiar to Ukrainian governorates in the Russian Empire and Halychyna and Bukovyna included in the Austro-Hungarian Empire at the time. The share of children (0-14 years old) in the age structure of the population in the Russian Empire in 1897 was 41.1%, the working-age population (15-59 years old) – 53.1%, older adults (60 years old and more) – 5.8%. The parameters were somewhat different in Ukrainian lands in the Austro-Hungarian Empire (within the respective administrative units, i.e. with modern parts of Poland and Romania): children – 38.9% in Halychyna and 38.2% in Bukovyna, working-age population – 56.3% and 56.8%, older adults – 4.8% and 4.9%. The changes in age composition were generally similar in these ten years – the share of older adults increased (to 6.3% in Halychyna and 6.5% in Bukovyna), the share of the working-age population dropped (to 53.7% and 55.9%), and the share of children changed slightly – it increased to 40.0% in Halychyna and dropped to 37.6% in Bukovyna.

Ukrainian lands were the donors to the economic development of various areas of the Russian Empire. About a million Ukrainian peasants moved to the North Caucasus in 1880–1914, and 1,743,000 were displaced from eastern Ukrainian lands for permanent residence to Siberia, Southern Ural, Far East, and North Caucasus during 1885–1914. Instead, numerous Russians were moved to Ukrainian cities: 1.4 million Russians resettled during 1801–1914.

Emigration massively covered Ukrainian peasants of western Ukrainian lands in the early 19th century. Over a million people moved overseas during 1881–1914.

Overall, this period has the first signs of the start of a demographic transition for Ukraine – a reduction in the number of deaths and a somewhat slower reduction of births. Significant natural

population growth was slightly diminished by migrant outflow, but the traditions of a high birth rate secured the positive population dynamics. This demographic development cannot be seen as demographically-sustainable, since it had caused the overpopulation of some areas, yet in the following historical periods, it contributed to the complete restoration of the population size and its structures due to demographic catastrophes and crises distorting the process of demographic transition.

Stage 2. 1914–1918: World War I; national liberation of 1918–1920; Russian occupation of the Ukrainian People's Republic; 'red terror'; mass man-made famine of 1921–1923. The age–gender structure of the Ukrainian population had not been changing much before World War I. The beginning of the war brought increasing deaths, reduced births, and growing migration due to direct losses among soldiers and civilians. Direct losses of the Ukrainian population in World War I are estimated as 1,359,000 dead. Moreover, 395,000 died in Ukraine in national liberation in the after-war period. As a result, the population of all Ukrainian lands was 44.1 million as of 28th August, 1920, out of 47.1 million as of 1st January, 1914. In the following years, the population was decreasing due to the high death rate related mainly to the 'red terror' policy that caused the deaths of about a million people and the first mass man-made famine of 1921–1923.

The birth rate declined significantly (up to 23 ‰). Mortality growth had been lasting in western lands till 1920 (up to 40 ‰ some years) and in the Ukrainian SSR as far as 1922. Therefore, the age–gender pyramid for 1926 shows the reduced number of births during the war (at the age of 5–9) and an imbalance of the shares of males and females over 25 years old due to many losses of men in war.

The next migration wave occurred during the Ukrainian National Revolution (1917–1921): the total number of emigrants exceeded 240,000 back then. Many settled in Poland, Czechoslovakia, France, the USA, Canada, and Argentina.

Demographic sustainability was much distorted by a catastrophic decline in birth rate and imbalances between genders in working reproductive age. The volume of indirect losses of the population in that period is estimated at 3.2 million. Total losses of the population in the first demographic catastrophe in all Ukrainian lands in 1914–1923 were 6–7 million. The impact of all these events allows categorising this demographic development stage in Ukraine as the first demographic catastrophe in Ukraine in the 20th century.

Stage 3. The 1920s–1939: collectivisation and mass deportations; the Holodomor Genocide of 1932–1933; mass repressions. The year 1924 marked the beginning of a short several-year period of significant natural population growth. The 1926 census recorded the population growth in the Ukrainian SSR to 29.02 million. The 1930 and 1931 censuses on western Ukrainian lands counted 10.65 million people. The demographic development of Ukraine in 1924–1929 was characterised by the most favourable natural population movement parameters in the 20th century, indicating the beginning of the process of demographic transition. Birth decline paces exceeded death decline paces, so the natural growth of the population in the Ukrainian SSR was reducing from 24‰ to 19.5‰ in that period. Even higher natural growth parameters accounted for the population in the North Caucasus Krai and Crimea (27‰). Among the western Ukrainian lands in that period, Zakarpattia, Volyn, and Western Polissya had a similar natural growth parameter (19.4–21.5‰), while the population in Bukovyna and Halychyna was growing slower (11.5–12.4‰). The main features here included a much lower birth rate and higher mortality caused mainly by overpopulation in agricultural areas. Overall, the population in all Ukrainian lands was growing annually by 0.9–1 million in 1924–1928.

1,059 females accounted for 1,000 males in the gender structure of the population in 1926. The age category ratio (the share of children of 0–14 years old / population aged 15–59 / population aged 60 and older) in the structure of the population of the Ukrainian SSR was 37.2 / 56.6 / 6.2. The ratios in Volyn and Polissya were similar – 37.7 / 55.9 / 6.4, while they were slightly different in Halychyna, where the birth rate was lower – 32.4 / 60.1 / 7.5, respectively.

The Holodomor Genocide of 1932–1933 was the second demographic catastrophe for Ukraine. It was caused by the violent collectivisation of farms and large-scale dekulakisation with further deportation beyond the Ukrainian SSR to the remote areas of the USSR or beyond the farms to poor lands. Numerous peasant revolts were suppressed and tens of thousands of people were

jailed and executed. Total losses from the Holodomor in the Ukrainian SSR are estimated within the range of 7–10 million. In the first place, these are the losses directly from famine, as well as those deported, jailed, and executed. The catastrophe scale is defined not only by quantitative demographic measures, but also by the depth of deformation of demographic reproduction structures mainly of the largest national and social segment – the rural population that was under the genocide blade of the totalitarian communist regime.

Natural population growth in the Ukrainian SSR in the post-Holodomor year 1934 was minimal – 88,200, in 1935 – 417,200. However, taking into account the endeavours of the totalitarian regime to cover the real Holodomor's consequences, the aggregated official data can be unreliable in that period.

The 'repressed' census of 1937 records 28.39 million people in the Ukrainian SSR. The official data of the next census in 1939 indicates 30.95 million people, but it is worth remembering that the data contains a range of falsification and manipulations. Namely, the data takes into account those 'counted in a special manner' (military personnel, NKVD officers, and their family members, imprisoned), the population of the Ukrainian SSR was 29.27 million without them. The age structure of the population (33% / 61.2% / 5.8%) shows a reducing share of children and older adults. These categories were the most vulnerable in genocide crime. A clear asymmetry of age structure is also a distinctive feature – 1,194 females per 1,000 males. Overall, the number of males reduced by 650,000, while the number of females increased by 994,000.

The crimes of the totalitarian Kremlin regime caused deep deformations of demographic sustainability in the Ukrainian SSR. In addition to direct losses (mainly children, older adults, and young men), there were many unborn in 1932–1933 and the post-Holodomor period, which affected the demographic reproduction capacity of Ukraine in the next generations even more than the first demographic catastrophe.

The following are the main migration flows that changed quantitative and structural demographic parameters of the Ukrainian SSR and its regions: deportations, peasants' migration to cities, mines, and construction sites of mostly Donetska and Dnipropetrovska oblasts, and organised recruitment of workforce from the Russian Soviet Federative Socialist Republic and the Byelorussian Soviet Socialist Republic, resettlement of the population from these 'republics' to the steppe areas of the Ukrainian SSR. Namely, 320,000 peasants were forced to relocate to eastern areas of the USSR in 1930–1931. Moreover, over 200,000 Ukrainian residents were sent to the GULAG concentration camps in the pre-war years. The totalitarian USSR regime deported 60,000 Poles from then-Polish regions to Kazakhstan in 1936.

The so-called Great Terror (Great Purge) of 1937–1938 was the next stage of the destruction of the Ukrainian nation after the Holodomor. If the main blow was directed at Ukrainian peasants in 1932–1933, the Ukrainian intelligentsia was the target in 1937–1938. Up to 200,000 people were sentenced in the territory of the Ukrainian SSR during the Great Terror, about two-thirds of them – to death. The rest were sent to jails and camps.

In the meantime, a high birth rate decline paces were accompanied by a lower death rate decline paces in the western Ukrainian lands, leading to decreasing natural population growth from 12‰ to 6.3‰ in Bukovyna (1930–1936), from 14‰ to 8.3‰ in Halychyna (1930–1938), from 21‰ to 13.6‰ in Volyn and Polissya (1930–1938), from 22.1‰ to 14.3‰ in Zakarpattya (1930–1936). Emigration from western Ukrainian lands in the inter-war period (1919–1939) was 0.3 million people.

The total population size in Ukraine within its modern boundaries was 40.86 million people as of early 1939.

Stage 4. 1939–1945: the Molotov–Ribbentrop Pact; World War II. World War II began with the division of the territory of contemporary Poland. According to the secret protocol of the Molotov–Ribbentrop Pact, USSR occupied almost all western Ukrainian lands and included them in the Ukrainian SSR. The occupation was accompanied by mass terror and deportation of the local population – about 1.2 million people were taken to Siberia and Middle Asia from September 1939 till June 1941.

2.4 million people were deported from Ukraine to Germany from the beginning of the German-Soviet war till 1944. About 450,000 of them died there doing forced labour. Some share of survived forced labourers after the defeat of Germany decided not to return to their Motherland for

various reasons; between 143,000 and 200,000 Ukrainians left for the countries of North and South Americas, Great Britain, Australia, and New Zealand after the war. Many USSR citizens who had returned from Germany (forced labourers, captives) or other countries were sent to the GULAG forced labour camps.

The total irreversible losses (killed) of the Ukrainian SSR population in 1939–1945 are estimated at 8 to 10 million. Meanwhile, aggregate demographic losses of Ukraine caused by the war were much higher – 13.5–14.5 million (killed, dead to diseases and starvation, evacuated, deported, mobilised, emigrants, losses in natural growth).

In the period from January 1941 to January 1945, the third demographic catastrophe reduced the Ukrainian SSR population from 41 million to 27.4 million.

The lack of proper population records eliminates any opportunity to analyse all demographic sustainability parameters during the catastrophe years. Yet, one can argue that its main demographic consequences include the reduced population of the Ukrainian SSR by one-third and the death of the most capable part of the population, especially males. The third demographic catastrophe significantly reduced the birth rate and the overall opportunity to reproduce the population normally for a long post-war time.

Stage 5. 1945–1950s: mass deportations: the third mass man-made famine of 1946–1947. Unfortunately, the totalitarian communist regime was not condemned by the world after World War II. It allowed the USSR officials to continue their practice of extinction and submission of the population of controlled 'republics'. Due to the accusation of Crimean Tatars of cooperation with the Nazis in May 1944, 191,000 of them were deported from Crimea to the Uzbek Soviet Socialist Republic and some areas of the Russian Soviet Federative Socialist Republic. Along with them, Greeks, Bulgarians, and Armenians were deported from Crimea (about 37,000 in total). 203,000 people were forced to resettle from the western regions of Ukraine between the mid-1940s and early 1950s to eliminate the national liberation movement of Ukrainians. According to agreements on the population exchange, almost the entire Polish population in the western oblasts of Ukraine was resettled to Poland, while the Ukrainian population was sent to other Ukrainian oblasts or the west and north of Poland.

As the consequence of the purposeful removal of grain by the totalitarian regime and general post-war devastation, a mass man-made famine began in the Ukrainian SSR in 1946. It led to the death of about 1.5 million residents of the Ukrainian SSR in 1946–1947.

Overall, 2.88 million of de-kulakised peasants and their family members were deported from Ukraine from the late 1920s to the early 1950s. Mass deportations and famine prevented a quick restoration of the population size and elimination of imbalances in its structures, mainly in the gender one – females accounted for 80% of all engaged in the economy in the post-war years.

Stage 6. The 1950s–1991: Ukraine in the USSR. After Stalin died in 1954, the repressions were somewhat weakened, but the repression machine was not completely stopped. The repressions ceased to be mass-scale during the 1950s–1980s and acquired a purposeful nature. The participants of opposition dissident organisations or individual dissidents were their victims. Overall, according to estimates (based on archives of the Security Service of Ukraine), over a million people were arrested in Ukraine between 1927 and 1990, 545,000 of them were sentenced, and at least 140,000 of the letter were executed.

The depth of the consequences of the third demographic catastrophe is demonstrated by the data of the 1959 census that indicates that 41.8 million people lived in the Ukrainian SSR, while the pre-war population size was restored only in 1960. The absence of further demographic catastrophes and significant crises is explained by the growing birth rate in the 1950s–1960s. Along with the reduction of mortality traditional after the demographic catastrophe, it contributed to the growth in the population size of the Ukrainian SSR. Yet, the paces started to slow down in the mid-1960s due to the falling aggregate birth coefficient down to less than 2 children per woman. Fertility has been slowly falling since then, and mortality has been stabilising.

World War II significantly deformed the age structure – 1,254 females accounted for 1,000 males in 1959. For the next 40 years, the rate was falling to 1,167 females for the period of the USSR collapse, but it was higher than even in 1939.

All the post-war censuses recorded the consistent trend of a growing share of older age groups (60 years old and more) in the total population, indicating the process of demographic ageing. This group's share was 10.5% in 1959 and increased to 18% in 1989. Therefore, the share of children (0–14 years old) dropped in this period from 26% to 21.6% and older adults from 63.5% to 60.4% (Fig. 1).

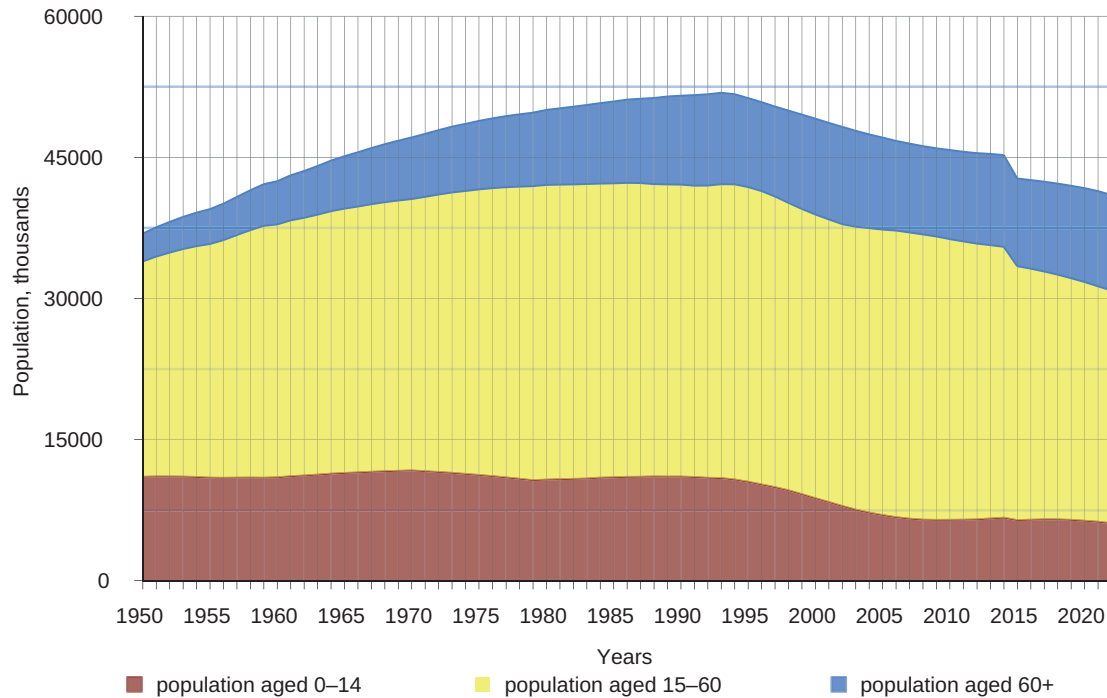


Figure 1. Dynamics of the population in Ukraine – total number and age groups (1950–2022)

Source: Own elaboration based on the data from USSR State Statistical Committee (1988) and Population of Ukraine (2022b).

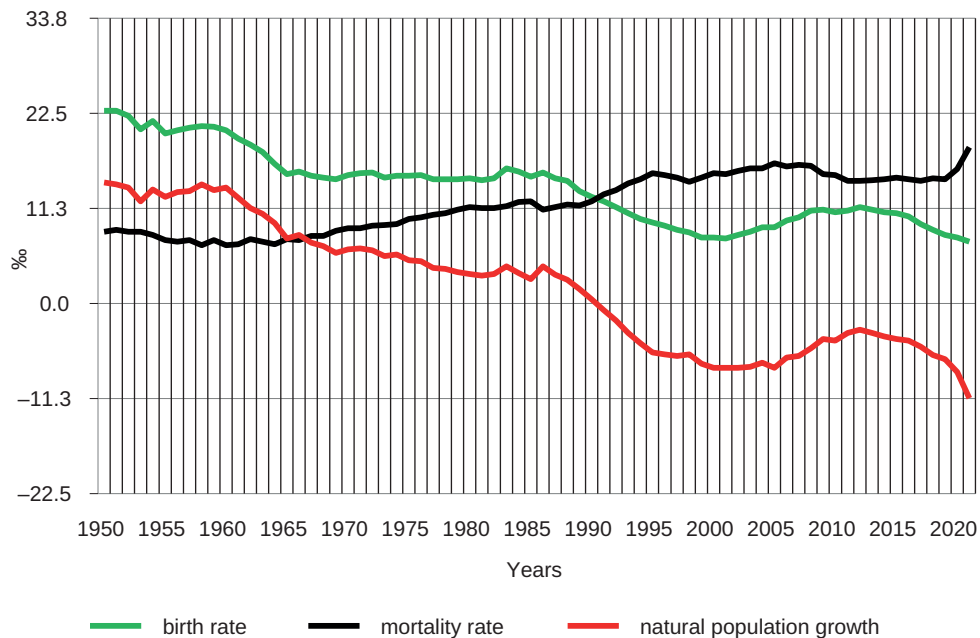


Figure 2. Birth rate, mortality, and natural population growth of Ukraine (1950–2021)

Source: Own elaboration based on the data from USSR State Statistical Committee (1988) and Population of Ukraine (2022b).

The growing population in the post-war period of the existence of the Ukrainian SSR was secured by consistent natural growth. The post-war birth rate was gradually falling from 22.8‰ in 1950 to 15.3‰ in 1965 (Fig. 2). Since then and till 1988, it was at the level of 14.6-16‰. The mortality rate in 1950–1970 was ranging between 6.9–8.9‰ and started growing afterward to 12.1‰ in the 1990s. Net migration (in the balance with other ‘republics’ of the USSR, there hardly was any migration abroad) had been mostly positive till the 1980s, albeit slightly.

Overall, the analysis of parameters of this demographic development stage indicates a high demographic sustainability level in its demographic reproduction sense.

Stage 7. 1991–23.02.2022: aggravation of socio-economic and demographic crises, ‘hybrid’ Russian attack on Ukraine, occupation of Crimea, and establishment of puppet regimes in some areas of Donetska and Luhanska oblasts (ORDLO); COVID-19. A gradual fall of fertility at growing mortality, which provided a slight natural growth of the population in the Ukrainian SSR in the late 1980s, occurred at the background of the socio-economic crisis in the USSR that aggravated after it had collapsed. The destruction of economic relations, deteriorating conditions and standards of living, and uncertainty of tomorrow constitute the set of socio-economic factors affecting the demographic behaviour of the population in independent Ukraine. It significantly accelerated the depopulation trends laid in Ukraine in the late 1970s, which were mostly displayed in rural areas. Ukraine achieved its historical maximum of 52.2 million in 1993. It marked the beginning of a consistent rapid reduction of the population size.

The 2011 census records 48.5 million residents in Ukraine. The gender proportions have settled at 1,156–1,170 females per 1,000 males for the entire period of restored independence. Demographic ageing has quick paces: each 5th resident was over 60 years old in 2011, already each fourth in 2021. The share of children reduced to 15.2% in 2021.

A sharp fall in birth rate started at the turn of the 1990s and lasted till 2001, having reached the mark of 7.7‰. A slight birth growth (to 11.4‰) till 2012 was again replaced by a consistent fall down to the historical minimum of 7.3‰ in 2021. Growing mortality is mostly the sign of ageing of the population. The rate first increased to 16.6‰ in 2005, stabilised in the 2010s at 14.5–14.9‰, and significantly increased in 2020–2021, which is directly related to excess mortality due to COVID-19: 20,600 in 2020 and 86,000 in 2021. It caused the highest mortality since World War II – 18.5‰ and the natural population decrease at the -11.2‰ level.

Migration in the period of independence is generally negative. After 1990–1993, when the total migration balance was 571,900 (in particular, more than 200,000 Crimean Tatars came back to Ukraine in the early 1990s), a lasting economic crisis combined with a relative border openness brought about a negative net migration of 1.22 million in the next decade. Labour migration of both seasonal and permanent nature acquired substantial volumes. Slightly positive net migration was recorded in the next years (2005–2021) – 320,000. Yet, migration processes were significantly transforming in that period. They acquired a circulating nature. Official statistics only count the de-registration, whereas many Ukrainians live abroad temporarily or permanently while keeping Ukrainian citizenship. The number of Ukrainian labour migrants simultaneously staying abroad in 2019–2021 is estimated at 2.5–3 million.

Considering current events, the results of the 2001 census are very important as they show that 10.8% of the country’s population were born abroad, i.e. they are immigrants (5.2 million people), and over 2/3 of them have arrived from the Russian Federation (3.6 million people). Namely, the share of born abroad in Crimea was 32%, (18.8% in Russia), 33.1% and 26.9%, respectively, in Sevastopol, 14.6% and 11.9% in the Donetska oblast, and 15.2% and 12.7% in the Luhanska oblast.

Russian occupation of Crimea and Sevastopol and Russian aggression in the east of Ukraine in 2014 became the new challenges to Ukraine’s demographic sustainability. It has generated a lasting demographic crisis in the occupied areas of the Donetska and Luhanska oblasts (ORDLO). There were 1.47 million internally displaced persons (IDPs) in Ukraine as of 6th July, 2021. The total human losses since the beginning of the war till 31st January, 2022, are 13,100–13,300 dead and 29,500–33,500 wounded.

Since there is no satisfying census, it is worth addressing the results of current population records of 1st December, 2019 – 37.289 million people without the occupied Crimea and Sevastopol.

Despite the criticism of the survey, we consider it more accurate than the current count of the population held by the State Statistics Service of Ukraine (41.923 million or 4.634 million more), mainly considering the number of the population in the Donetska and Luhanska oblasts, which is the estimate due to fragmented demographic information from the ORDLO territory.

This stage is characterised by an irreversible reduction of the population size. The significant natural decrease was not compensated by permanent migration inflow, but it was, instead, reinforced by circulating labour migration increasingly turning into emigration. The measures launched by the Ukrainian Government in 2005 to boost the birth rate provided some effect for the next ten years. They were also reinforced by the fact that the generation born in the 1980s entered its reproduction age. Yet, consistently high mortality indicates that demographic transition has not been finalised in Ukraine. Ukraine's demographic sustainability was significantly disturbed back in the mid-1990s and was deteriorating in the following years.

Stage 8. From 24th February, 2022, till nowadays: the large-scale Russian invasion of Ukraine. A new turn of the demographic crisis in Ukraine started on 24th February, 2022. From the viewpoint of the quantitative and qualitative dimensions of demographic changes, it has every chance of becoming the new demographic catastrophe. The large-scale Russian invasion of Ukraine has already caused tens of thousands of deaths among Ukrainians (civilians and soldiers) and several millions of forcibly displaced people abroad and within Ukraine. According to the UN, 8 million Ukrainian residents have left abroad in 4 months of the large-scale Russian war against Ukraine, and about 1.3 million of them have left for Russia, including 240,000 children. 2.837 million came back. Based on this information, the UN estimates the total number of forced Ukrainian migrants abroad at approximately 5 million people since the beginning of the war. The number of internally displaced persons (IDPs) in Ukraine is over 7.1 million. Overall, about 15.7 million people need humanitarian aid and protection.

The State Statistics Service of Ukraine provides the data of 41.17 million people as of 1st January, 2022, within these limits (36.62 million according to records). 2.48 million people resided in the occupied Crimea and Sevastopol as of 1st January, 2022 (net migration in 8 years of occupation is formed mostly by those arriving from Russia and amounts to about 200,000 people).

The data corresponds to the worst scenario predicted before the war by the Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine (Low fertility – Low life expectancy – Low net migration), which provided that there should have been 42.55 million people as of 1st January, 2022 (including Crimea and Sevastopol). The more optimistic scenarios of the UN in the pre-war period predicted 41.2 million Ukrainian residents in 2030 and 36.41 million in 2050.

Therefore, taking into account this condition and estimating the natural decrease of the population, we can speak about the present population size in Ukraine of no more than 36 million people as of mid-2022. Based upon the results of the population record of 2019, it is 31.5 million. Since it was mostly women, children, and older adults leaving abroad, the current age–gender structure of the population has been much distorted. It is obvious that after the war has ended, most migrants will have come back to Ukraine, but the number is inversely proportional to the duration of martial law and aggression of the Russian Federation as well as directly proportional to the speed of housing, social, and economic infrastructure recovery, and economic recovery in general. It also depends on the degree of the adaptation of Ukrainian migrants abroad and the interest of hosting countries in them, which can partially lead to a relatively low level of male emigration in the post-war period.

Recommendations

The demographic development of Ukraine continues to directly depend on military-political and socio-economic conditions. The current demographic situation catastrophically aggravates the demographic crisis that had existed in Ukraine before the Russian invasion. It is difficult to estimate the scale of demographic changes and direct and indirect human losses in conditions of warfare. However, there is an urgent need to carry out the respective analysis and determine the tools and means to restore and improve the demographic situation in the post-war period. New realities set

new tasks to implement the demographic policy measures on operational, tactical, and strategic levels. The demographic sustainability of Ukraine currently cannot be achieved autonomously without the positive impact of external factors – the respective demographic and socio-economic policy of the state and its regions.

It is difficult to implement the measures of demographic and socio-economic policies in times of hostilities when the focus is placed on the security of the state, its citizens, and territories. Yet, the main directions of demographic and socio-economic policies that would boost the achievement of demographic sustainability in Ukraine in the post-war period should be specified now.

These directions can be combined in several groups. (1) *With regard to migration*: the creation of conditions for a quick return of forced migrants from abroad (mostly the solution of housing and employment issues); the regulation of immigration flows with the view to establish an efficient mechanism of substitution of natural losses of Ukrainian population; boosting the motivation to reside in rural areas. (2) *With regard to boosting fertility and family policy*: economic stimulation of families with many children, the creation of preconditions for the increase of fertility level by a gradual transition from mostly having one or two children to medium-sized type of reproductive behaviour of families; the comprehensive reinforcement of family institute, social protection, and financial encouragement of responsible parenthood; tax incentives and support of families with 2 and more children; the creation of conditions for employment and personal fulfilment of youth; the promotion of implementation of various forms of parents' employment. (3) *With regard to life expectancy*: the improvement of the quality of medical care; the prevention of an excessive number of abortions; the development and implementation of activities directed at the improvement of youth health. (4) *With regard to the population of older age groups*: the maintenance of the competitiveness of the population of older age categories on the labour market as well as the securing of decent labour remuneration for them; the functioning of 'silver universities'; the overcoming of gender imbalance; the development of regional programmes of assistance for older adults; the provision of a wide network of specialised establishments for older adults; the functioning of the infrastructure in compliance with the needs of older adults. (5) *With regard to employment and the creation of new jobs*: an active inclusion of youth in entrepreneurship by preferential lending for starting a business; the support of self-employment, family businesses, farms, and other family employment forms; preferential lending for SMEs; the creation of agritourism clusters and agricultural cooperatives harvesting non-timber forest products and cultivating berries; the creation of primary agricultural processing mini-companies; the restoration of traditional crafts.

Moreover, it is of utmost importance to hold the census and organise the qualitative demographic register in territorial communities.

Conclusion

The analysis of the Ukrainian demographic development in the last 125 years indicates that external factors were the main factors of demographic sustainability distortion in Ukraine – wars, mass man-made famines, deportations, and repressions. By World War I and, to a lesser extent, in short periods between three demographic catastrophes, a significant demographic capacity were founded, enabling the restoration of the population size in quantitative terms after demographic catastrophes. However, they caused significant deformations of age–gender, ethnolinguistic, and socio-economic structures of the population that distorted the normal demographic development of the country.

The totalitarian communist regime violently established in most Ukrainian territories in 1919–1921 and later extended to the entire territory of modern Ukraine had a decisive impact on the Ukrainian demographic sustainability. It is confirmed by the analysis of consequences of directly or indirectly caused demographic crises during the 1910s–1950s. As a result, the classical demographic transition did not occur in Ukraine. Current high mortality shows its incompleteness. Overall, the stage of demographic transition with high birth rate and low mortality ('baby boom') was quite possible in conditions of extended population reproduction that had taken place by 1914. Yet, its possibility was eliminated by three demographic catastrophes covering a 35-year period from 1914 to 1949, and the demographic reproduction capacity was implemented only partially in

1924–1929, 1935–1936, and the 1950s–1960s. The 1950s–1980s marked the period of relatively stable demographic development, but some negative trends of the natural population movement in rural areas have been apparent since the late 1960s.

The demographic crisis started in the 1990s and culminated in the COVID-19 pandemic. The configuration of the current demographic reproduction structures of the Ukrainian population indicates the lack of sufficient demographic sustainability, which is a significant threat to the national scale. The current processes of natural reproduction of the population are much distorted. In the nearest future, it can lead to a sharp fertility decline. Ukraine is actually in danger of a demographic catastrophe – the next one caused by violent Kremlin policy. In the 20th century, Ukraine survived a range of such catastrophes and comparatively smaller by its consequences demographic crises, which are directly related to the aggression of totalitarian regimes. Yet, they occurred at the initial stages of demographic transition, when the fertility was high, and the role of economic factors in demographic behaviour was insignificant. Nowadays, Ukraine does not have the capacity to turn back to at least zero population growth either through natural movement or migration. Natural decrease and a huge wave of forced migrants with a high share of children and women of reproductive age create significant ‘spaces’ in the age–gender structure of the population. It is necessary to take active measures of demographic and socio-economic policies to prevent a catastrophic drop in the population size, harmonise its natural movement and migration, and eliminate imbalances in demographic structures. They should be implemented in the post-war period in several directions: fertility and family policy, migration, life expectancy, ageing, and employment.

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