



JRC SCIENCE FOR POLICY REPORT

UKRAINE'S POPULATION FUTURE AFTER THE RUSSIAN INVASION

The role of migration for demographic change

This publication is a Science for Policy report by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The contents of this publication do not necessarily reflect the position or opinion of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication. For information on the methodology and quality underlying the data used in this publication for which the source is neither Eurostat nor other Commission services, users should contact the referenced source. The designations employed and the presentation of material on the maps do not imply the expression of any opinion whatsoever on the part of the European Union concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Contact information

Name: Philipp Ueffing
Email: philipp.ueffing@ec.europa.eu

EU Science Hub

<https://joint-research-centre.ec.europa.eu>

JRC132458

EUR 31439 EN

Print ISBN 978-92-68-00430-2 ISSN 1018-5593 doi:10.2760/756870 KJ-NA-31-439-EN-C

PDF ISBN 978-92-68-00431-9 ISSN 1831-9424 [doi:10.2760/607962](https://doi.org/10.2760/607962) KJ-NA-31-439-EN-N

Luxembourg: Publications Office of the European Union, 2023

© European Union, 2023



The reuse policy of the European Commission documents is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Unless otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of photos or other material that is not owned by the European Union/European Atomic Energy Community, permission must be sought directly from the copyright holders. The European Union does not own the copyright in relation to the following elements:

- Cover page illustration, ©Rick – Adobe Stock.com; ©weyo – Adobe Stock.com

How to cite this report: Ueffing P., Adhikari S., Goujon A., KC S., Poznyak O. and Natale F. (2023) *Ukraine's population future after the Russian Invasion – The role of migration for demographic change*, Publications Office of the European Union, Luxembourg 2023, doi:10.2760/607962, JRC132458.

Contents

- Abstract.....1
- Executive summary.....2
- 1 Introduction.....3
- 2 Demography of Ukraine before the Russian invasion.....5
 - 2.1 Population decline since independence.....5
 - 2.2 Low fertility and high mortality.....6
 - 2.3 Emigration since independence.....7
 - 2.4 Migration numbers before the Invasion.....8
 - 2.5 The population structure before the invasion.....10
- 3 International displacement and Ukraine’s population since the Invasion.....12
 - 3.1 Magnitude and destinations.....12
 - 3.2 Demographic composition.....13
 - 3.3 Return of refugees.....14
 - 3.4 Demographic impact of international displacement.....15
- 4 Ukraine’s demographic future: Migration scenarios.....17
 - 4.1 International displacement outlook.....17
 - 4.2 Post-war migration outlook.....18
 - 4.3 Rationale of migration scenarios.....19
 - 4.4 Quantifying the scenarios for population projections.....19
 - 4.5 Impact of migration on population size.....23
 - 4.6 Impact of migration on population structure.....24
- 5 Conclusion.....27
- Bibliography.....28
- List of figures.....31
- List of tables.....32
- Appendix.....33

Abstract

This report analyses the impact of the Russian invasion of 24 February 2022 on the longer-term future of Ukraine's population size and structure. It focuses on the role of migration as a component of demographic change. Based on a review of past demographic trends and an assessment of the size and composition of the internationally displaced population from Ukraine, four qualitative migration scenarios are translated into population projections up to 2052. Under the most pessimistic *Long War and Low Return* scenario, the results show a decline of 31% of the population. Even in an optimistic scenario of future migration trends where Ukraine recovers quickly and becomes a net receiving country of migrants in the longer term, the results suggest a population decline of 21% by 2052. The difference in population decline across the four considered migration scenarios matches the uncertainty in the UN projections, suggesting that migration will be as important as fertility and mortality in driving population change in Ukraine following the war. The likely strong decrease in population comes with challenges of population ageing and a declining workforce that put stress on the economy and social support systems. The report contributes to forward-looking policymaking supporting the long-term economic and social recovery of Ukraine by anticipating possible consequences of migratory movements on longer-term population trends in Ukraine.

Authors

UEFFING Phillip (JRC) (lead author)

ADHIKARI Saroja (IIASA), GOUJON Anne (IIASA), KC Samir (IIASA), POZNYAK Oleksii (Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine), NATALE Fabrizio (JRC)

Acknowledgements

The authors would like to thank the following individuals for their valuable feedback and insightful comments on earlier versions of the report: Jonathan Chaloff (OECD), Ave Lauren (OECD), Nina Kajander (European Commission), Minke Meijnders (UN Global Pulse), Anna Rosińska (University of Venice), Fabiana Scapolo (European Commission), and Sabina Sirokovska (European Commission).

Executive summary

This report analyses the impact of the Russian invasion of 24 February 2022 on the longer-term future of Ukraine's population size and structure. It focuses on migration as a component of demographic change. Four *what-if* scenarios are developed with varying assumptions on the extent of the displacement triggered by the war, the level of return migration, and possible future migration patterns of temporary, circular and permanent movements.

The report integrates migration scenarios developed from qualitative reasoning about the likely evolution of migration during and after the war into the population projections of the United Nations, which were based on the single assumption of near zero net-migration over the longer term, following a short period of high return of refugees.

The widening of the assumptions on migration trends is necessary to provide policy-makers with a nuanced picture of how migration could impact the future of the Ukrainian population. The underestimation of recent emigration of young Ukrainians leaving the country already before the invasion to work abroad, especially to Poland, and new developments such as Ukraine receiving an EU candidate status signal the significant role migration has already played and is likely to continue to play in the future. However, it is impossible to project or forecast migration trends with much accuracy over longer term. Compared to the other two drivers of demographic change - fertility and mortality -, which change slowly over time, migration is much more uncertain, volatile and complex. The strength of migration scenarios is that they can put "uncertainties and discontinuities at the centre of attention and thereby facilitate long-term, high-level strategic decision-making". The aim is not to predict the future but to anticipate how the international displacement caused by the Russian invasion, return migration, and future migration trends could influence the size and the composition of Ukraine's population over the coming decades.

The qualitative scenarios spanning a range of possible migration futures are translated into quantitative population projections using a multidimensional population model. The model shows the possible evolutions of the size and age-sex composition of Ukraine's population over the next three decades up to 2052. It takes into account the different types of migration, and projects international displacement, return migration and post-war immigration and emigration.

Our findings show that the accelerated population decline due to the Russian invasion is unlikely to reverse over the next decade. Even under the most optimistic *Migration Transition* scenario, where Ukraine recovers quickly and follows the example of other Eastern European countries in becoming a net receiving country, the results suggest a population decline of 21% by 2050. The strongest decline of 30% of the population is expected under the *Long War and Low Return* scenario, which assumes a long, intensive war characterised by low returns and delays in economic recovery and reconstruction.

The difference of four million people in population decline across the four considered migration scenarios matches the uncertainty in the UN projections. This suggests that migration will be as important as fertility and mortality in driving population change in Ukraine following the war.

Long-term economic and social recovery as well as political developments will be important factors for Ukraine's demographic future. The likely strong population decrease comes with challenges linked to population ageing and a declining workforce that put stress on the economy and social support systems. While the focus in the current unfolding war is on the short-term needs linked to temporary displacement, our analysis contributes to forward-looking policymaking, trying to anticipate possible consequences of migratory movements on longer-term population trends in Ukraine. The projections signal that strong strategies will be needed on issues such as long-term care, life-long learning, intergenerational fairness, migrant reintegration, or diaspora engagement to address the rapid ageing of the population as well as the loss of human capital.

Understanding the scope of possible futures of the Ukraine's population and their variability can help to make informed decisions about the allocation of support in line with the country's needs. The *Rapid Damage and Needs Assessment (RDNA)* carried out by the European Commission in cooperation with the Government of Ukraine and the World Bank already stressed the importance of demography in estimating, among others, short and long-term needs for housing, transport, education or energy.

1 Introduction

The Russian invasion of Ukraine on 24 February 2022 has dramatically affected the Ukrainian population. Millions have been displaced and thousands have lost their lives. Many have fled to other European countries. For the first time, the EU activated the Temporary Protection Directive, offering immediate protection in the form of temporary residence permits in EU Member States (MS), with access to education, accommodation, medical and social services, and labour markets¹. Ursula von der Leyen, the president of the European Commission, declared that the EU ‘will provide protection to those seeking shelter’ and ‘help those looking for a safe way home’². With the majority of refugees from Ukraine having found refuge in the EU Member States, EU policies and cooperation among the Member States will influence the migratory movements from and back to Ukraine and, in turn, demographic change in the country.

Wars are the most extreme case of sudden shocks to demographic dynamics. In particular, sudden migratory movements caused by wars can lead to fast population changes that are often not in line with the general view of demography being slow-moving and predictable³. Already before the war, the population of Ukraine had been declining for almost three decades due to low fertility, relatively high mortality and high levels of emigration. The Russian invasion led to the ‘fastest growing refugee crisis since World War II’ with ‘displacement on an unprecedented scale’⁴. The full extent of this sudden shock on Ukraine’s population will be shaped by the length and evolution of the war. The course of the war remains uncertain, and it is difficult to draw meaningful conclusions from previous refugee movements due to the incomparability of the conflicts. Much will depend on how many people will flee and how many of the already 8 million^{5 6} people who have left the country will ultimately return.

For a medium and long-term perspective, possible post-war trends of demographic dynamics that relate to possible social, economic and political futures need to be taken into account. The European Commission and other countries have committed to support the reconstruction of Ukraine and a Rapid Damage and Needs Assessment (RDNA) carried out by the World Bank in cooperation with the Government of Ukraine and the European Commission in 2022 already stressed the importance of demography in estimating, among others, short and long-term needs for housing, transport, healthcare, education or energy⁷. The country also applied for EU membership shortly after the Russian invasion and was granted a candidate status⁸. This report looks at the medium and long-term impact of the war on Ukraine’s population size and composition, considering the immediate effect on the demographic processes of mortality, fertility and in particular of migration.

Fertility and mortality patterns and trends change slowly over time and are projected with much more accuracy than migration, which is more uncertain, volatile and complex⁹. Possible migration futures of Ukraine following the war span from continuously high number of emigrants as in the decades before the war - possibly facilitated by free-movement in the EU - or a transition to a country attracting immigrants after a successful rebuild, following a path of other European countries such as Poland or Czechia. With fertility being low, and projected

¹ European Commission (2022) Council implementing decision: establishing the existence of a mass influx of displaced persons from Ukraine within the meaning of Article 5 of Council Directive 2001/55/EC of 20 July 2001, and having the effect of introducing temporary protection. Brussels, 02.03.2022, COM(2022) 91 final, 2022/0069 (NLE).

² European Commission (2022) Ukraine: Commission proposes temporary protection for people fleeing war in Ukraine and guidelines for border checks. Press release, 2 March 2022, European Commission, Brussels. URL: file:///C:/Users/ueffikl/AppData/Local/Temp/1/Ukraine_Commission_proposes_temporary_protection_for_people_fleeing_war_in_Ukraine_and_guidelines_for_border_checks.pdf (accessed 05.08.2022)

³ Billari FC (2022) Demography: Fast and Slow. Population and Development Review, 48: 9-30.

⁴ UNHCR (2022) Minister of Social Policy of Ukraine and UNHCR Ukraine Representative sign agreement to expand displaced persons’ access to social protection including cash assistance. Press release, 19.04.2022, UNCHR Ukraine.

⁵ UNHCR (2022) Ukraine Refugee Situation. Operational Data Portal. <https://data.unhcr.org/en/situations/ukraine> (accessed 18.12.2022).

⁶ We are using the official UNHCR data in this report. However, there are limitations in its accuracy due to the difficult nature of data collection. The UNHCR figure takes into account “official estimated figures” but when these are not available, it reflects the sum of registrations for temporary protection or similar national protection schemes and the number of asylum applications lodged by refugees from Ukraine. As such, they may contain duplicate registrations and registrations of people who have returned to Ukraine.

⁷ World Bank (2022) Ukraine Rapid Damage and Needs Assessment (English). August 2022, the World Bank, Government of Ukraine, European Commission. Washington, D.C.: World Bank Group.

⁸ European Council (2022) European Council conclusions on Ukraine, the membership applications of Ukraine, the Republic of Moldova and Georgia, Western Balkans and external relations, 23 June 2022. European Council, Council of the EU, Press Releases, European Council Conclusions 23 June 2022. URL: <https://www.consilium.europa.eu/en/press/press-releases/2022/06/23/european-council-conclusions-on-ukraine-the-membership-applications-of-ukraine-the-republic-of-moldova-and-georgia-western-balkans-and-external-relations-23-june-2022/> (accessed 08.08.2022).

⁹ Bijak J and Czaika M (2020) Assessing Uncertain Migration Futures – A Typology of the Unknown. QuantMig Project Deliverable D1.1. Southampton / Krems: University of Southampton and Danube University Krems.

to likely remain under the replacement level over the next decades (United Nations 2022), migration will be an essential factor for Ukraine's post-war population future.

Following the introduction, the second chapter of the report presents the demographic dynamics in Ukraine before the war, which are necessary to take into account when making assumptions about possible post-war developments. The third chapter looks at the impact that the international displacement triggered by the Russian invasion has had on the country's population. In the fourth chapter, the report presents exploratory scenarios for the impact of migration on the longer-term demographic future of the Ukrainian population. The conclusion summarises the main points and relevance for policymaking.

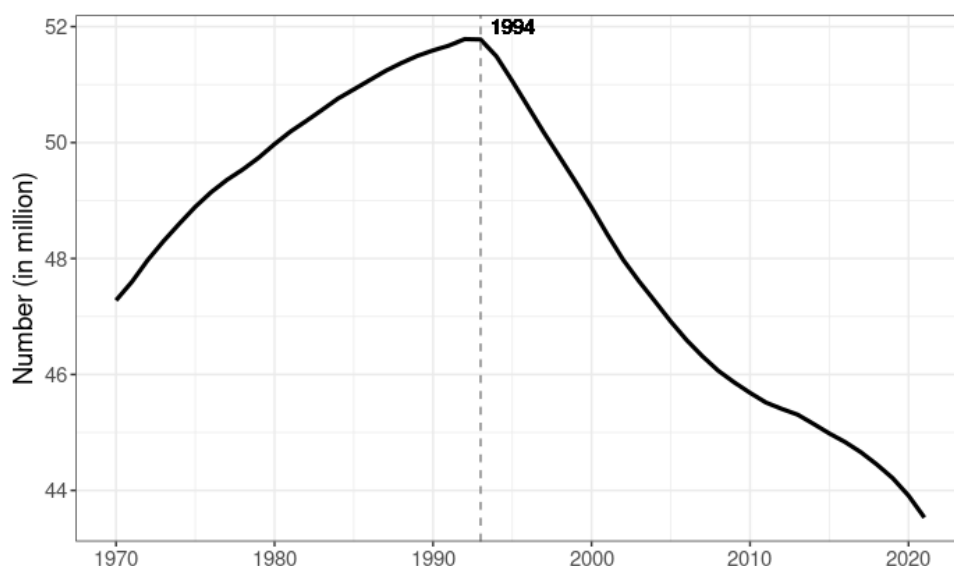
2 Demography of Ukraine before the Russian invasion

Population dynamics have significant built-in inertia. To make assumptions about the demographic future of Ukraine after the Russian invasion, it is necessary to first understand the past trends. This chapter describes the context of the long-term population decline in Ukraine since its independence in 1991 and the trends in fertility, mortality and migration that have underpinned changes in population size and structure over the last three decades.

2.1 Population decline since independence

Over the last decades, Ukraine has experienced population decline and rapid population ageing. The United Nations estimates a population of 43.3 million¹⁰ for 1 January 2022, less than two months before the Russian invasion (the estimate includes the Autonomous Republic of Crimea which was annexed by Russia in 2014). There were about 8 million more people in the early 1990s when population decline emerged and then accelerated in the post-Soviet era. The population of Ukraine had been growing since the end of the Second World War and peaked at 51.7 million in 1994 (Figure 1).

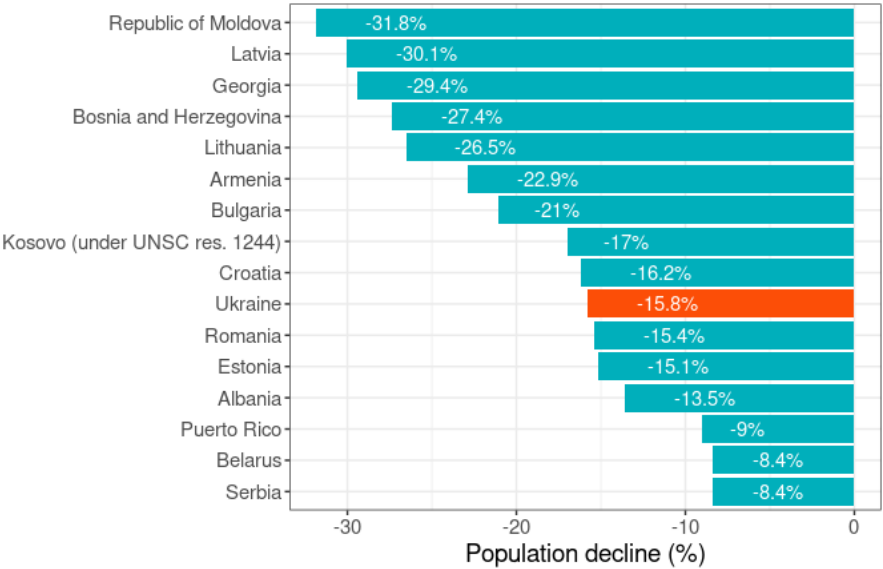
Figure 1 Size of the population of Ukraine, January 1970 to January 2022. Source: United Nations Population Division (2022) *World Population Prospects*



The decrease in the population size is a result of low fertility, high mortality and emigration. Many countries in Central, Eastern and South-Eastern Europe have experienced similar demographic trends after the collapse of state socialism and the transition to a market economy, which brought major economic, social and political transformations affecting population dynamics. Demographic trends have recovered to a different degree across countries from fertility falling to very low levels and rising mortality in the 1990s. With fertility among the lowest throughout the period and the late start in life-expectancy increases, Ukraine's population decline is among the most dramatic with a drop of 16% in population size between 1994 and 2022. Higher declines are only registered in the Baltic States and Romania and Bulgaria, due to high emigration, in particular after becoming Member States of the EU, as well as some countries of the former Yugoslavia (Bosnia and Herzegovina, Croatia) and in the Caucasus (Armenia, Georgia), where conflict and political instability drove emigration.

¹⁰ United Nations Department of Economic and Social Affairs (2022) *World Population Prospects, 2022 Revision*. United Nations: New York.

Figure 2 Countries or areas with the largest relative decline in population size between January 1991 and January 2022 (Only countries or areas with a population greater than 1 million in 2022 included). Source: United Nations Population Division (2022) *World Population Prospects*



2.2 Low fertility and high mortality

Fertility in Ukraine was very low in 2021, with only 1.2 births per woman. This was the lowest number estimated for any country in Europe. Fertility levels had fallen dramatically after Ukraine’s independence, to an even lower number of 1.1 births per woman. Before, they had been fluctuating around the replacement level of 2.1 births per woman since the 1960s, which is roughly the average number of children per woman needed to maintain the size of a population. There was a short recovery back to 1.5 births per woman in the early 2010s, which has been linked to a brief effect of government support in the form of birth allowances,¹¹ before fertility fell again to a very low level.

The very low level of fertility in Ukraine is explained by the high prevalence of one-child families that emerged after independence and results from high economic uncertainty, poor prospects, lack of support services and family policies, and the persistence of conservative gender norms¹². Furthermore, the social and political uncertainty might have been amplified by the armed conflict that started in the Donbass region in 2014, as well as the COVID pandemic¹³. There has also been little recovery in fertility rates from postponement of childbearing, as women in Ukraine have continued to have children at relatively young age (with an average age of first birth in their mid-20s), unlike in most other Central and Eastern European countries, where the average age to have a first child has increased steadily. As a consequence of the long-term trend of low fertility, generational sizes have shrunk considerably. While there were still about 800 000 births per year in the mid-1980s, there were less than half that number in 2021, with 336 000 births¹⁴.

Mortality has swung up and down since independence. Overall, life-expectancy somewhat improved from 69.1 years in 1991 to 71.6 years in 2021. It had dropped to 66.8 years during the transition to a market-economy in the 1990s. In fact, life-expectancy had been on a deteriorating trend since the 1960s, when it already stood at 70.7 years. It took well into the first decade of the 2000s to recover. There was a short period of growth in life-expectancy between 2009 and 2016, where it increased by four years to over 74 years. Life-expectancy

¹¹ Frejka T and Gietel-Basten S (2016) Fertility and Family Policies in Central and Eastern Europe after 1990. *Comparative Population Studies*, 41(1).
¹² Sobotka T (2011) Fertility in Central and Eastern Europe after 1989: Collapse and Gradual Recovery. *Historical Social Research*, 36 (2).
¹³ Perelli-Harris B, Hilevich Y and Gerber T (2021) *Uncertainty across the “Contact Line”: armed conflict, COVID-19, and perceptions of fertility decline in Eastern Ukraine*. Paper presented at the European Population Conference 2022, 29 June to 2 July, Groningen, Netherlands.
¹⁴ All numbers of births for Ukraine include Crimea. Source: United Nations Department of Economic and Social Affairs (2022) *World Population Prospects, 2022 Revision*. United Nations: New York.

then plateaued with the conflict in the Donbass region, before it dropped down in 2020 and 2021 during the COVID-19 pandemic¹⁵.

There is a large, persistent gap in life-expectancy between men and women in Ukraine. Male life-expectancy is about 10 years lower than female life-expectancy. While this large gap is observed in many post-Soviet European countries, it is twice the size of that in other parts of Europe, where women live on average about five years longer than men. It is explained by the generally lower life-expectancy and by behavioural and other preventable factors linked to causes of death that affect men and women differently. Deaths from non-communicable and from 'man-made-diseases' such as alcoholism, smoking, or road traffic accidents remain high in Ukraine¹⁶. Alcohol-related deaths alone are estimated to account for about one-third of male and one-fifth of female life-expectancy difference between Ukraine and Western European countries¹⁷.

2.3 Emigration since independence

International migration numbers, patterns and conditions fundamentally changed after the collapse of state socialism, and periods of high emigration have contributed to the population decline. Ukraine has been one of the major countries or origin of migrants in Europe. There is a diverse geography of destination countries of Ukrainian migrants, with Poland, Italy, Czechia, Spain, Germany and Russia as main receivers. The forms of migration also diversified. Temporary and circular migration, particularly in connection with working abroad, have increased in addition to migration of more permanent character.¹⁸ To have an understanding of how these trends evolved, this section briefly summarises Ukraine's migration history and social, economic and regulatory developments.

Migration processes since Ukraine's independence in 1991 can be divided into several distinct periods¹⁹. In the immediate years following the communist era, when mobility had been strictly regulated, high numbers of people moved across the newly independent countries to repatriate. Ukraine saw mainly people of Ukrainian descent and Crimean Tatars returning. There were also refugees arriving from conflicts that sprung up in some of the ex-soviet countries. This migration was partly offset by the descendants of the other parts of the former Soviet Union leaving Ukraine, especially by ethnic Russians moving to Russia. A significant number of ethnic Germans, Greeks and people of Jewish background also emigrated from Ukraine to Western countries and Israel.

The following decade, from 1994 to 2004, was marked by high levels of emigration and little immigration. Economic drivers of migration became more important than political drivers and the demographic base for post-Soviet repatriation depleted. Worsening economic conditions during the systemic crises of the transition period led people to leave the country while immigration dropped to low levels. According to United Nations estimates, about 1 million more people left Ukraine than arrived over the 10-year span²⁰. Temporary mobility accelerated as indicated by the annual border crossings, which increased from about 4.5 million to more than 15 million²¹. Institutional reforms enabled free movement and facilitated labour migration abroad. Visa-free travel was still possible to neighbouring countries before they joined the EU.

Migration decreased for a short period before the financial crisis in 2007-08, as the economy somewhat stabilised. Emigration decreased and immigration increased mostly from return movements. Nevertheless, people continued to leave the country for work or family reunification, making use of the migration networks that had formed in Eastern and Southern Europe. Ukrainians in Italy and Spain gained permanent residence throughout several regularisation programmes that were carried out in those countries for undocumented migrants²².

Migration between 2009 and 2017 was marked by multiple crises: first the 2008 financial crisis, and then, after 2014, the emerging military crisis in the Donbass region. Labour migration was relatively low during the

¹⁵ Kurylo I (2022) Tendencies of mortality and life expectancy in Ukraine before the Russian full-scale military invasion. *Economy and Sociology*, June (1).

¹⁶ Mesle F and Vallin J (2012) *Mortality and Causes of Death in 20th-Century Ukraine*, Demographic Research Monographs, Springer Science.

¹⁷ Levchuk N (2009) *Alcohol and mortality in Ukraine*. MPIDR Working Paper 2009-17. Max-Planck-Institut for Demographic Research.

¹⁸ Vakhitova H and Fihel A (2020) International Migration from Ukraine: Will Trends Increase or Go into Reverse? *Central and Eastern European Migration Review*, 9(2).

¹⁹ Malynovska O (2020) International Migration of the Ukrainian Population since Independence. In: M Denisenko, S Strozza and M Light (eds.), *Migration from the Newly Independent States, Societies and Political Orders in Transition*, Springer Nature: Switzerland.

²⁰ United Nations Department of Economic and Social Affairs (2022) *World Population Prospects, 2022 Revision*. United Nations: New York.

²¹ Ukrainian Border Guard Statistics cited in Malynovska

²² Finotelli C and Arango J (2011) Regularisation of Unauthorised Immigrants in Italy and Spain: Determinants and Effects. *Documents d'Analisi Geografica* 57(3): 495-515.

financial crisis due to a subdued demand in destination countries. It increased significantly following the recession. Especially Poland was an attractive destination. The country experienced strong economic growth and introduced legislation to attract labour migrants from Ukraine and other neighbouring countries^{23 24}. Migration for family reunification also rose. In addition, people fled the conflict in the East of the country, leading to more than 1.5 million internally displaced²⁵ and asylum seekers from Ukraine in Russia and the EU. With poor economic and political conditions, there was an increase in the length of stay abroad and decline in return migration. The composition of labour migrants changed with younger, higher educated people from urban areas working as professionals emerging among the predominant blue-collar labour migration.

In 2017, Ukraine signed an association agreement with the EU, which granted visa-free movement to the Schengen area. Emigration – temporary and permanent – remained high. While visa-free travel does not constitute the right to work or reside in EU countries, it might have enabled migration for irregular employment²⁶, it facilitates migration by allowing travel to seek out work or education opportunities. The differences in income between Ukraine and the EU are large. The economies of other former socialist countries that are already EU Member States, such as Poland or Czechia, have performed well. Although they recorded high emigration in the first decades after independence, they have later turned into net-receiving countries. Ukrainian immigrants have been major contributors to their positive migration balance. Ukraine has carried out reforms to support return migration through measures related to citizenship, the recognition of qualifications earned abroad, protection while abroad and support of reintegration.

This section laid out the context in which Ukrainian migration processes evolved since its independence without detailing numbers. The migration processes in the turbulent times of the 1990s and 2000s generally matched those in Central and Eastern Europe with high numbers, diverse forms and patterns and with a strong labour component. The characteristics of Ukrainian populations has difference across countries. For example, the proximity of Poland and Czechia encouraged more people to circulate with the majority being men, whereas in the Mediterranean region more people have tended to settle and the majority being women. In the years leading up to the Russian invasion, emigration from Ukraine increased steadily. This is linked on the one hand to the push factors of a prolonged economic and political crisis as well as the military conflict in the Donbass region; and, on the other hand to the increased ease of entry to the EU. The quantification of the migration from and to Ukraine is challenged by existing data limitation. The next section discusses recent data on migration for Ukraine, with a focus on the EU context.

2.4 Migration numbers before the Invasion

There is a variety of data sources on migration for Ukraine²⁷ offering inconsistent information on the size and composition of the recent migrant movements. This has to do with the general data challenges about international migration, the lack of quality, timeliness, comparability and coherence, which often apply to countries such as Ukraine with high shares of temporary and circular movements that are difficult to track and measure.

Significant emigration in the years before the war is indicated by migration stock data. The number of Ukrainians abroad increased from 5.7 million to 6.1 million between 2015 and 2020 according to the latest available estimates from the United Nations²⁸. It fluctuated around 5.5 million from 1990 to 2010. These international migrant stock estimates are based on censuses in destination countries with specific shortcomings. Censuses are usually held only once in a decade and data published with a time lag of one or two years, so the estimates were derived to a large part from the 2010 international census round. In addition, a migrant is defined through information on people's place of birth. The high number of Ukrainians abroad is confounded by internal movement during the time of the Soviet Union and by the resettlement processes the years following its collapse. Nevertheless, the estimated increase by over half a million Ukrainians worldwide by the UN indicates

²³ Jaroszewicz M (2018) *Migration from Ukraine to Poland*. OSW Report October 2018, Centre for Eastern Studies: Warsaw.

²⁴ Kindler M, Kordasiewicz A and Szulecka M (2016) *Care needs and migration for domestic work: Ukraine-Poland*. Global Action Programme on Migrant Domestic Workers and their Families, an ILO/UE project. International Labour Office, Geneva, ILO 2016.

²⁵ IDMC (2022) *Displacement Data, Ukraine*, Internal Displacement Monitoring Centre, online database.

²⁶ Vakhitova and Fihel (2020)

²⁷ Pozniak O (2012) *Statistical data collection on migration in Ukraine*. European University Institute, CARIM East – Consortium for Applied Research on International Migration, Explanatory Note 12/02, Demographic and Economic Module.

²⁸ United Nations Department of Economic and Social Affairs, Population Division (2020). *International Migrant Stock 2020*. United Nations: New York.

a period of increased emigration. Unfortunately, there is no recent census data from Ukraine itself. The last Ukrainian census was carried out in 2001²⁹.

Administrative data on migration from the register of residence changes of Ukraine tell a different tale of recent migration trends³⁰. The register data of annual immigration and emigration numbers show that both trends were around 50 000 persons per year and indicate a marginally positive net-migration balance ranging from 5 000 to 15 000 persons per year over the last decade. This would create only a small impact of migration on population change in Ukraine in recent years and, in fact, not contribute to a decline but rather a minimal increase. However, emigration numbers from the register significantly underestimate the number of people leaving the country. It records permanent changes of residence and poorly covers circulatory and temporary movements, as many migrants do not register a change when planning a return. Non-declaration of changes of residence for economic considerations is also reported as a source of underestimation and inaccuracy in migration data from the Ukrainian register of residential changes³¹.

Survey data from the Labour Migration Survey confirm the high number of Ukrainians working and living abroad. The latest round was carried out in 2017 and found 1.3 million Ukrainians travelled abroad for the purpose of working or looking for work in another country during the observation period over 2.5 years³². The survey is integrated as a module into the Ukrainian Labour Force Survey and two earlier rounds were conducted in 2008 (spanning the periods 2005 to 2008³³) and 2012 (spanning from 2010 to 2012³⁴ (a fourth round of the Labour Migration Survey had been planned for 2022, but has been postponed indefinitely) that found numbers of similar magnitude, with 1.5 million and 1.2 million migrant workers. These numbers also present an underestimate, as the survey by design did not cover permanent migration in the case that the whole household left the country during the entire period. In addition, the latest survey could also not account for forced migration in Eastern Ukraine after 2014³⁵.

The Labour Migration surveys describe not only the changes in volume but provide details on the choice of destinations and the types of migration. Three out of four Ukrainian migrants had the EU as destination. Poland became the largest receiving country with an increase from 170 000 to 507 000 migrants from 2012 to 2017, while the numbers reported for Russia dropped from 510 000 to 342 000. Numbers of received labour migrants in Czechia and in Italy, the other two major destinations, remained around 150 000. The surveys also indicate the high number of temporary and circular movements. The average time spent abroad was just under 5 months and about 40 per cent of the labour migrants returned during the survey period. However, permanent migration is not covered adequately in the survey and estimates extrapolated from the information available in the survey find a considerable increase in the number of people staying longer time abroad and becoming permanent emigrants³⁶.

Data from Eurostat support the survey findings for Ukrainian migration to EU Member States. The number of Ukrainian citizens that hold a valid permit in a MS increased from just under 800 000 people in 2012 to more than 1.5 million in 2021³⁷ ³⁸. Similar to the estimates of Ukrainians abroad in the Migration Module of the Ukrainian Labour Force Survey, the Eurostat data on residence permits show Poland as the country with the highest number of Ukrainian migrants. There were 122 274 Ukrainians with a residence permit in Poland in 2012. This number increased steadily to 651 221 in 2022. Czechia experienced a significant jump in the number

²⁹ There was no census held in Ukraine as part of the 2010 international census round. A planned census in the 2020 international census round was first delayed due to the COVID-19 global pandemic and has been postponed indefinitely with the Russian war on Ukraine.

³⁰ Authors' elaborations from immigration and emigration data of the register of residence changes provided by *State Statistics Service Ukraine*

³¹ Slobodian O and Fitsova A (2018). *Registering Domiciles in Ukraine: How the System Affects Ukrainians. A Sociological Survey*. CEDOS – Think Tank: Kiev.

³² State Statistics Service of Ukraine (2018) *Population of External Labour Migrants*. Statistical Bulletin. URL: http://csrv2.ukrstat.gov.ua/druk/publicat/kat_u/2017/bl/12/bl_ztm_2017.zip (accessed 10.11.2022)

³³ Ukrainian Center for Social Reforms and State Statistics Service of Ukraine (2009) *Ukrainian External Labour Migration*. URL: http://csrv2.ukrstat.gov.ua/druk/katalog/pracia/migr_engl.rar (accessed 10.11.2022)

³⁴ International Labour Organisation (2013) *Report on the Methodology, Organization and Results of a Modular Sample Survey on Labour Migration in Ukraine*. URL: https://www.ilo.org/budapest/what-we-do/publications/WCMS_244693/lang--en/index.htm (accessed 10.11.2022)

³⁵ Jaroszewicz M (2018)

³⁶ Pozniak (2012) cited in Vakhitova and Fihel

³⁷ Statistics for EU27 Member States plus Iceland, Norway and Switzerland.

³⁸ Eurostat (2022) *Online Data Browser*. Data code MICR_RESVALID: All valid permits by reason, length of validity and citizenship on 31 December of each year. (last accessed 14/12/2022)

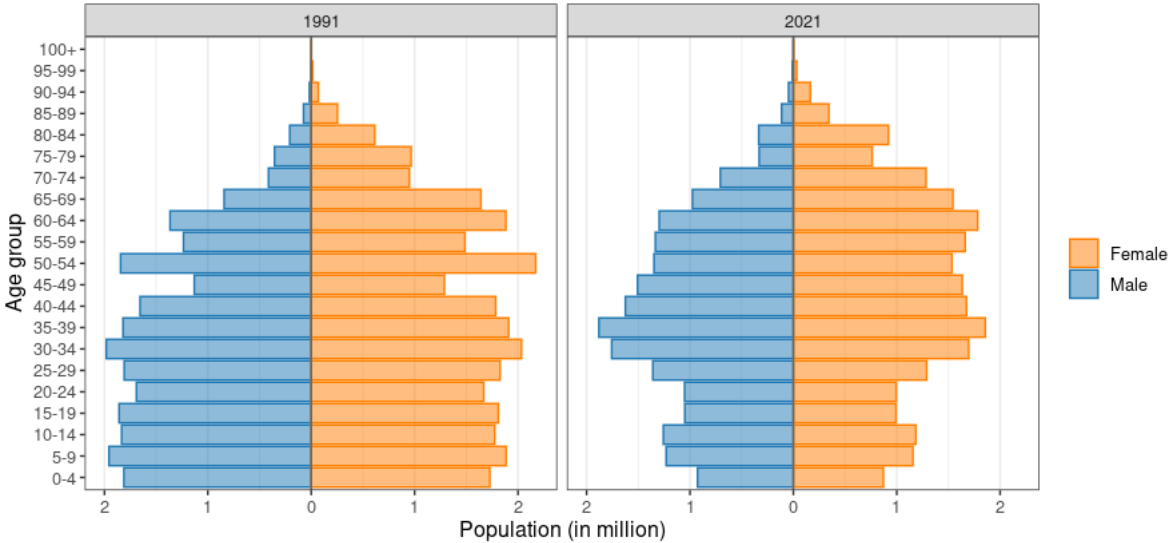
of residence permit holders only after the year of the last Migration Survey. The number almost doubled from 116 236 in 2017 to 193 547 in 2021.

In the decade before the Russian invasion, there was less change in the number of Ukrainian residence permit holders in the previous major destination countries. In Italy, it fluctuated around 230 000 Ukrainian citizens. Spain saw a small increase from 78 214 in 2012 to 97 442 in 2021; while the number dropped in Germany from 111 747 to 83 043. In contrast, Hungary, Slovakia, and Lithuania experienced a six-fold to tenfold increase and all register more than 30 000 Ukrainian residence permit holders in 2021. Generally, most Eastern Member States of the EU27 saw significant increases in residence permit holders from Ukraine, while their number was stagnant in the former destination countries of EU15 (Member States that entered the EU before 2003). There are also differences in the demographic composition. While the balance between men and women among the Ukrainian residence permit holders is exactly even for the whole of the EU, there tend to be more women and a higher concentration of older adult age groups in the Western EU Member States, while the Eastern Member States register more men and a higher share of younger adult age groups.

2.5 The population structure before the invasion

The demographic dynamics of low fertility, high mortality, and waves of large emigration have considerably altered the structure of the Ukrainian population. The changes in the age and sex³⁹ composition underpin the decline in total population size by 8 million people since independence. At the start of the Russian invasion, Ukraine’s population was markedly ageing, with its younger population decreasing in proportion compared to older age groups (Figure 3). In contrast, in 1991, Ukraine still had a relatively youthful population structure. As a result of fertility around replacement level in the preceding decades, age cohorts in the population below 25 years of age were of about similar size. There were just under 2 million men and women in each five-year age group from 0 to 4 years of age to 20 to 24 years of age.

Figure 3 Age-sex composition of the Ukrainian Population in 1991 and 2021. Source: Authors’ elaborations based on United Nations Population Division (2022) World Population Prospects.



The dramatic decline in fertility in the 1990s led to successively smaller birth cohorts. In 2021, the population of men and women between 25 and 29 years of age (people born between 1990 and 1995), was only about 1.4 million. For men and women between 20 and 24 years of age (those born between 1995 and 2000), these numbers dropped further to about 1 million in each population and were only half the size of the age group of 20 to 24 year old in 1991.

Not only the decline in fertility, but also the waves of emigration contributed to an age structure of a rapidly ageing population. As is generally the case with migration, it was mostly young people, including parents with children, who emigrated. The relatively low life-expectancy of Ukrainian men and the gap of ten years compared

³⁹ In this report we use the term ‘sex’ to refer to the demographic category used in the available population statistics by the United Nations, EUROSTAT and National Statistical Agencies from which data were sourced.

to the life-expectancy of Ukrainian women explains the high surplus of women in the population over 60 years of age. Overall, the demographic dynamics in Ukraine have led to a population decline and rapid ageing, leaving its population exposed to the shock of a war and a potential challenging its demographic future.

3 International displacement and Ukraine's population since the invasion

The Russian invasion of Ukraine has led to displacement of a size not seen since the Second World War, according to United Nations High Commissioner for Refugees⁴⁰. This chapter reviews data on the size and composition of the international displacement at the end of 2022, after ten months of Russian military aggression against Ukraine, and assesses its demographic impact. Only international displacement is discussed. This chapter does not look into the demographic losses from mortality and fertility as data availability remains much more limited and uncertain, and the focus of the report is on the role of migratory movements for Ukraine's demography.

3.1 Magnitude and destinations

According to UNHCR data, more than 7.8⁴¹ million refugees from Ukraine⁴² were recorded in Europe⁴³ in December 2022⁴⁴, nearing an early projection by UNHCR for international displacement from the Russian invasion of 8.3 million until the end of year 2022⁴⁵. The number reflects a conservative estimate of individual refugees from Ukraine in Europe (including Russia and Belarus) since 24 February 2022. The total number 8 million refugees comprises more than 100 000 arrivals of Ukrainians in Canada⁴⁶ and the United States of America⁴⁷, albeit this number also includes Ukrainians admitted for other reasons than on humanitarian ground of fleeing an armed conflict.

The number of people fleeing the Russian military aggression against Ukraine was high in the first month of the war, then continued at a slower pace from April to October, and appears to have eased off towards the end of the year (Figure 4). UNHCR only provides a continuous data series since the beginning of the war of border crossings statistics. There were up to 200 000 exits per day from Ukraine in the first weeks of the war. Cumulative movements out of the country amounted to 4 million at the end of March 2022, rising at a reduced pace to 14.7 million from April to October, before slowing down noticeably again and reaching 16.3 million in December. However, border crossings reflect movements, which can be pendular, and do not correspond to the number of individuals outside or inside of the country. There were also over 9 million cross-border movements into the Ukraine (UNHCR data on crossings into the Ukraine are not available for the border with Belarus and the Russian Federation). The indicator on the recorded number of refugees is available from UNHCR statistics from June 2022, by which time it was already 4.8 million. The trend is in line with the trend reflecting the border crossing statistics. In the four months from June to October 2022, about half a million additional refugees were recorded each month, before slowing down to a combined 250 000 between October and mid-December.

The highest number of recorded refugees according to the UNHCR data is in Russia with 2.8 million, followed by Poland with 1.5 million, Germany with 1.0 million and Czechia with 470 000. About 150 000 refugees from Ukraine are also recorded in countries with large Ukrainian diasporas: Italy, Spain, and the United Kingdom. The Eastern European countries Romania, Slovakia, and the Republic of Moldova that are featured in the UNHCR's Region Refugee Response Plan for Ukraine host about 100,000 refugees. Canada, the United States of America, and Israel, which have the largest migrant community of Ukrainians outside of Europe, have also received

⁴⁰ UNHCR (2022) Minister of Social Policy of Ukraine and UNHCR Ukraine Representative sign agreement to expand displaced persons' access to social protection including cash assistance. *Press release*, 19.04.2022, UNCHR Ukraine.

⁴¹ UNHCR (2022) Ukraine Refugee Situation. Operational Data Portal. <https://data.unhcr.org/en/situations/ukraine> (accessed 18.12.2022). We are using the official UNHCR data in this report. However, there are limitations in its accuracy due to the difficult nature of data collection. The UNHCR figure takes into account "official estimated figures" but when these are not available, it reflects the sum of registrations for temporary protection or similar national protection schemes and the number of asylum applications lodged by refugees from Ukraine. As such, they may contain duplicate registrations and registrations of people who have returned to Ukraine.

⁴² The term refugee is used generically, as it is used in UNHCR statistics, to describe all people fleeing from Ukraine due to the international armed conflict

⁴³ For the purpose of UNHCR statistics, "Europe" here corresponds to all Europe sub-regions as identified by Eurovoc (European Union, Thesaurus Eurovoc. Volume 2, Subject-oriented version, Publications Office, 2005), therefore including EU and non-EU countries belonging to Central and Eastern Europe, Northern Europe, Southern Europe, and Western Europe, plus Türkiye.

⁴⁴ UNHCR (2022) *Operational Data Portal – Ukraine Refugee Situation*. URL: <https://data.unhcr.org/en/situations/ukraine> (accessed 16.12.2022)

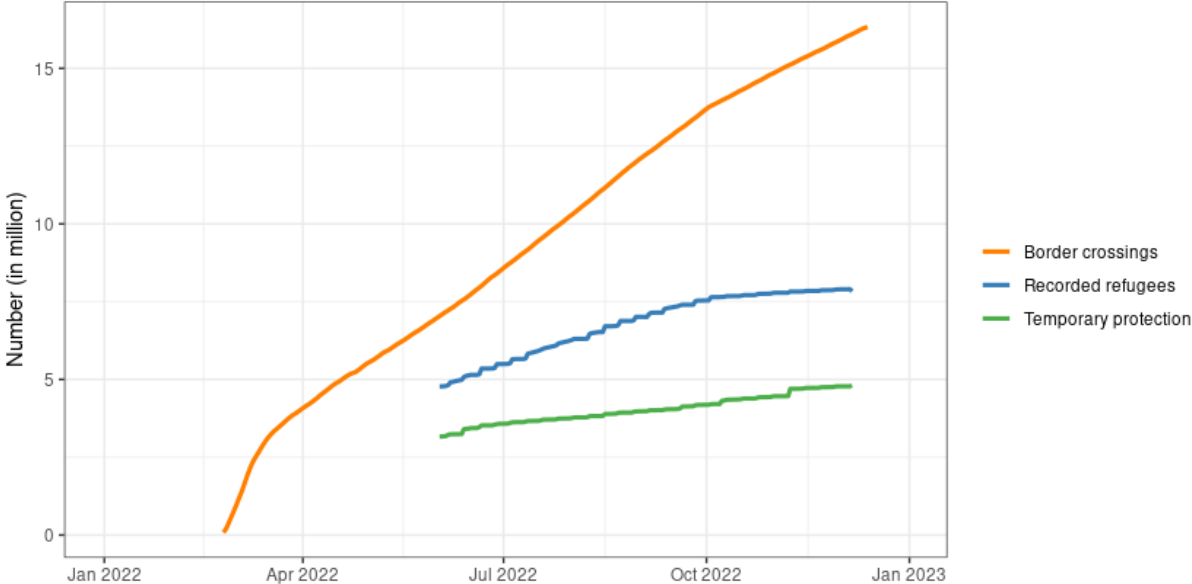
⁴⁵ UNHCR (2022) UNHCR and partners call for urgent support for refugees from Ukraine and their hosts. *UNHCR, Briefing Notes*, 26.04.2022. URL: <https://www.unhcr.org/news/briefing/2022/4/6267ac074/unhcr-partners-call-urgent-support-refugees-ukraine-hosts.html> (accessed 14.09.2022)

⁴⁶ Government of Canada (2022) *Ukraine immigration measures: Key figures*. URL: <https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/ukraine-measures/key-figures.html> (accessed 14.12.2022)

⁴⁷ CBS NEWS from 29 July 2022: U.S admits 100,000 Ukrainians in 5 months, fulfilling Biden pledge. URL: <https://www.cbsnews.com/news/us-admits-100000-ukrainians-in-5-months-fulfilling-biden-pledge/> (accessed 14.09.2022)

considerable numbers of Ukrainian refugees. Secondary movements of refugees from Ukraine, the move from the country in which they first arrived to another country to seek protection, will likely continue to change the distribution of refugees across destination countries.

Figure 4 Refugees from Ukraine: Border crossings, registered refugees across Europe, and refugees registered for temporary protection or similar schemes in Europe. Source: UNHCR (2022) Operational Data Portal – Ukraine Refugee Situation



The number of refugees from Ukraine registered for Temporary Protection or similar national protection is congruent with the number of recorded refugees in those countries where it is available for December 2022 (Data for Russia, Belarus and Turkey are not available). The Temporary Protection Directive of the EU⁴⁸ was activated already on 4 March when the Council of the European Union unanimously adopted the Council Implementing Decision 2022/382⁴⁹, giving those fleeing war in Ukraine the right to temporary protection. Over 4.8 million refugees from Ukraine have now registered for temporary protection or similar schemes in Europe (EU and Iceland, Norway, Switzerland and the United Kingdom), accounting for more than 96% of the recorded refugees in the UNHCR statistics for these countries. The detailed data on the Temporary Protection registration in the EU from the European Union Agency for Asylum⁵⁰ further show that 95% of registrations concern Ukrainian nationals, while the remaining 5% correspond in most cases to people with unreported citizenship and to a smaller extent to Russian nationals.

3.2 Demographic composition

The demography of refugees is different from the demography of economic migrants (Figure 5). The majority of the refugees from Ukraine arriving in Europe are women with children and older adults. Few men of working age arrive as result of Ukrainian legislation, which prohibits men between 18 and 60 years of age from leaving the country⁵¹. Eurostat data for the over 4 million persons that applied for temporary protection comprises 41%

⁴⁸ Council Implementing Decision (EU) 2022/382 of 4 March 2022 established the existence of a mass influx of displaced persons from Ukraine as a consequence of an armed conflict within the meaning of the Temporary Protection Directive (Directive 2001/55/EC). The directive does not apply to Denmark. Iceland, Norway, Switzerland and the United Kingdom have introduced national protection schemes.

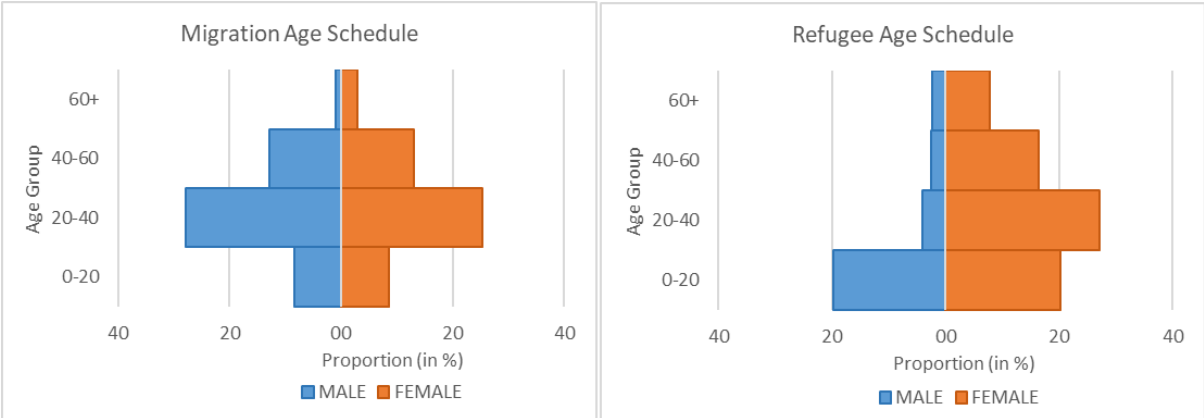
⁴⁹ Council Implementing Decision (EU) 2022/382 of 4 March 2022 established the existence of a mass influx of displaced persons from Ukraine as a consequence of an armed conflict within the meaning of the Temporary Protection Directive (Directive 2001/55/EC). The directive does not apply to Denmark. Iceland, Norway, Switzerland and the United Kingdom have introduced national protection schemes.

⁵⁰ EUAA (2022) *Ukraine Crisis: Data and Analysis*. EU Agency for Asylum. <https://euaa.europa.eu/ukraine-crisis-data-and-analysis> (accessed 12.12.2022)

⁵¹ Except of certain categories of persons who are not subject to conscription under the Law of Ukraine "On Mobilization Training and Mobilization" (unfit for military service are single fathers, men with three or more children under the age of 18 or a disabled child, etc.)

of children evenly split between boys and girls and 76% of women in the population over 18 years of age⁵². In the first months, when the number of people fleeing Ukraine was highest, the share of women and children was much higher, with only 7% of men among the arriving refugees and almost half being children. In September and October, men made up 30% of arrivals and the share of children went down to 25%. However, the absolute number of total arrivals was much lower. Survey data shows that about three quarters of the women who arrived without a partner have their partner staying back in Ukraine, mainly because of military conscription⁵³ ⁵⁴ ⁵⁵. The separation of families plays an important role in decisions concerning the length of stay. Depending on the course of the war, it will drive family reunification in countries of destination or motivate returns to Ukraine.

Figure 5 Comparison of the age composition of emigration, 2015-2020, with age composition of refugees after the Russian invasion. Source: Eurostat, ISTAT, UNHCR



The age structure of the refugees from Ukraine arriving in Europe is relatively young, with an average age of 29.4 years, compared to that of the total population of Ukraine of 42.3 years, and to that of previous Ukrainians migrants in the EU of 38.2 years. The age and sex distribution of the refugees in Europe is also different from that of the usual arrivals of asylum seekers, which are concentrated in young adult male ages, due to the ban prohibiting Ukrainian men from leaving the country. According to Eurostat data⁵⁶, the largest group among the Ukrainian refugees are women between 35 and 64 years of age, representing 26% of the total figure, compared to 8% of men of same age range. Women between 18 and 34 years of age account for 18% of all Ukrainian refugees, compared to 6% of men of the same age range. Only 5.4% of the refugees are above 65 years of age, and 4% of these are women.

3.3 Return of refugees

There is some evidence of refugees returning to Ukraine, although much uncertainty remains not only about their numbers, but also about their reported intentions to return. UNHCR data on border crossings from the neighbouring countries to Ukraine show that there were around 8.5 million movements back into the country, compared to the estimated 16.3 million movements out of the country, between the beginning of the Russian invasion and mid-December 2022. The number of crossings from the neighbouring countries back to Ukraine do not necessarily indicate sustainable returns, as a significant share is due to pendular movements in and out of the country. Data from the continuous General Population Survey of the IOM⁵⁷ in Ukraine, which focuses on internal displacements, suggested that there had been 5.9 million returnees (from internal and international

⁵² Eurostat (2022) *Data browser: Decisions granting temporary protection by citizenship, age and sex – monthly data* (online data code: MIGR_ASYTPFM). Data until end of October. (Accessed 12.12.2022)

⁵³ SAM-UKR Survey reported in EUAA, IOM, OECD (2022) *Forced displacement from and within Ukraine: Profiles, experiences, and aspirations of affected populations*. Joint EUAA, IOM and OECD report, October 2022.

⁵⁴ UNHCR interviews with refugees from Ukraine in Czechia, Hungary, the Republic of Moldova, Poland, Romania and Slovakia reported in UNHCR (2022) *Lives on hold: Profiles and intentions of refugees from Ukraine*. UNHCR Regional Bureau for Europe, July 2022.

⁵⁵ Representative survey of Ukrainian refugees in Germany reported in Federal Institute for Population Research (2022) *Geflüchtete aus der Ukraine in Deutschland: Flucht, Ankunft und Leben*. Dezember 2022.

⁵⁶ Eurostat (2022)

⁵⁷ IOM (2022) *IOM – Ukraine Internal Displacement Report: General Population Survey*. Multiple rounds: Round 8 (17-23 of August 2022), Round 9 (26 September 2022), and Round 10 (27 October 2022).

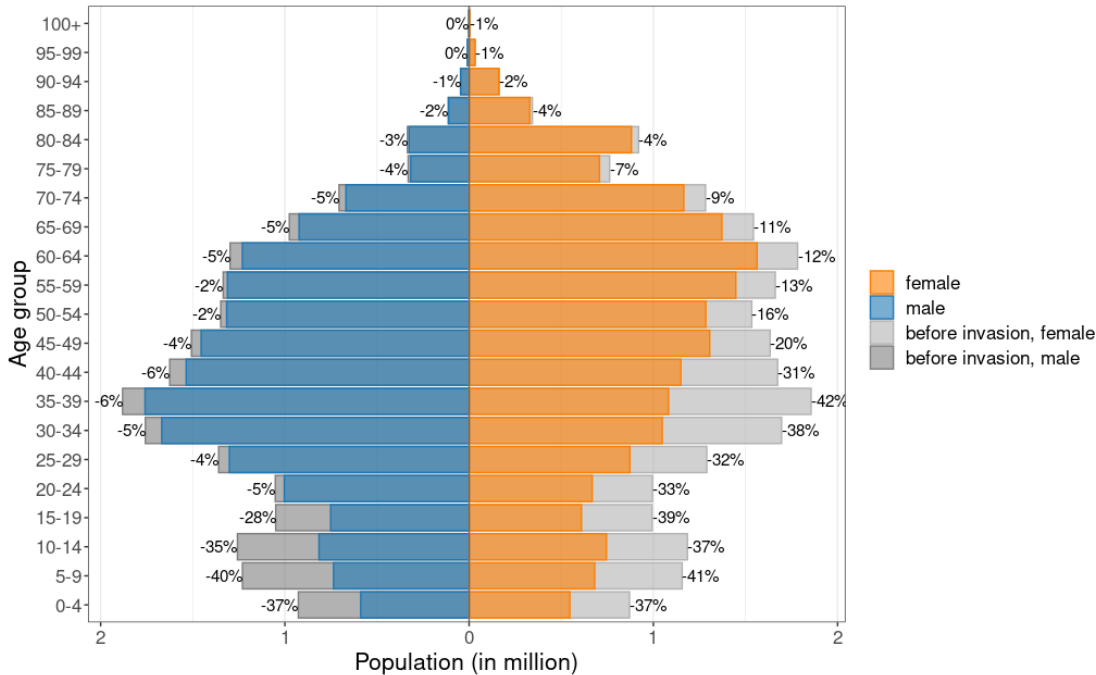
displacement) at the end of October 2022. The survey indicates that the share of returns from abroad (of all returns) accounted for 15% at the end of August 2022, and 23% at the end of October.

Return intentions among Ukrainian refugees are high according to a study by UNHCR⁵⁸, and family separation is the major reason behind the desire to go back. However, return is not seen as an immediate option by many. Uncertainty about the course of the war was cited by 65% of study participants as the reason for planning to remain in the current host country. The data in the UNHCR study was collected between mid-May and mid-June 2022, mainly in the countries bordering Ukraine. A more recent survey carried out in Germany between August and October 2022⁵⁹ recorded an intention to return in the short or long term among 47% of refugees, while 26% desired to stay. The remaining 27% were undecided about their future plans. The studies show the variation in refugee intentions with the possible influence on the timing and duration of displacement.

3.4 Demographic impact of international displacement

Almost a fifth of the Ukrainian population has been internationally displaced since February 2022; 8 million refugees compared to a population of 43.3 million at the beginning of the Russian invasion (the share of internationally displaced persons out of total population would be slightly higher if the 2.4 million people in the illegally-annexed Crimea were not taken into account in the total Ukrainian population). EU countries are host to 4.5 million refugees from Ukraine, which corresponds to about 1% of the size of the EU population. We are using the official UNHCR data in this report to cover Ukrainian refugees to all destinations. However, there are limitations in its accuracy due to the difficult nature of data collection. The UNHCR figure takes into account “official estimated figures” but when these are not available, it reflects the sum of registrations for temporary protection or similar national protection schemes and the number of asylum applications lodged by refugees from Ukraine. As such, they may contain duplicate registrations and registrations of people who have already left the European Union.

Figure 6 Impact of international displacement on Ukraine’s population: Pre-war age-sex structure of the population (Estimate for 1 January 2022) and the impact of international displacement per age and sex group. Source: Authors’ estimates based on data from ISTAT, Eurostat and UNHCR



There is no detailed age breakdown available from Eurostat or UNHCR for the internationally displaced people in Ukraine. To estimate the age structure of the internationally displaced, we apply the age structure by five year age groups from the detailed data available for temporary protection holders in Italy provided by the

⁵⁸ UNHCR interviews with refugees from Ukraine in Czechia, Hungary, the Republic of Moldova, Poland, Romania and Slovakia reported in UNHCR (2022) *Lives on hold: Profiles and intentions of refugees from Ukraine*. UNHCR Regional Bureau for Europe, July 2022
⁵⁹ Federal Institute for Population Research (2022) *Geflüchtete aus der Ukraine in Deutschland: Flucht, Ankunft und Leben*. Dezember 2022

Italian National Statistical Institute⁶⁰, to the total number of refugees in Europe from Eurostat and to the estimated magnitude of international displacement from UNHCR and national sources for Canada, Israel and the United States of America (see discussion in previous sections).

Figure 6 compares the displacement from the war in 2022 to the Ukrainian population before the Russian invasion (The estimate of the pre-war population shown in grey colour in Figure 6 is for 1 January 2022). It shows to what extent the age and sex composition of the population is affected by the international displacement. Around 40% of the children under the age of 15 have left Ukraine since the beginning of the invasion. The number is similarly high for girls and young women between 15 and 19 years of age. For men above 19 years of age, the share of the population that has fled the country drops to less than 6%, as men from the age of 18 to 60 are prohibited from leaving the country. The share of women who have left the country is high among women between 20 and 49 years of age, ranging from 31% in the age group 25-29 to 42% in the age group 35-39. The share of women recorded as refugees gradually drops among women above 50 years of age, from 20% in the age group 50-54 to 9% in the age group 70-74. Above the age of 80, the share of refugees reduces to very small numbers for both sex. It should be kept in mind that these numbers only indicate the impact of migration. The age-sex composition does not include mortality and fertility dynamics and does not reflect an estimate of the Ukrainian population at the end of 2022.

⁶⁰ Dipartimento della Protezione Civile – Team Dati (2022) Dati generati dalla piattaforma contributi di sostentamento e dal Ministero dell'Interno. Dati: <https://github.com/pcm-dpc/UKR-2022/tree/master/data/subsistence-allowance> (accessed 06.12.2022)

4 Ukraine's demographic future: Migration scenarios

The future of Ukraine's population after the war is explored using projection scenarios that take into account the impact of the international displacement triggered by the war as well as possible longer-term migration trends. Scenarios offer policy-makers the chance to reflect on the possible demographic developments and provide quantitative estimates of the possible effects of different migration futures. However, they should be interpreted as a tool for discussion about future alternatives to improve policy preparedness rather than forecasts about the future⁶¹. They are useful for the 'move from crisis management to finding long-term structural approaches to migration', called for in the European Agenda on Migration and further set out in the proposed European Pact on Migration and Asylum^{62 63}.

Looking beyond the war and the immediate impact of displacement, the demographic future of Ukraine could be shaped by longer-term return, immigration and emigration patterns closely linked to economic development. In countries with low fertility such as Ukraine, migration has the potential to become a major driver of demographic change^{64 65}. The United Nations projects continued population decline in Ukraine over the next decades, mainly due to fertility remaining at low levels. The UN projects a decrease from 43.3 million people in 2022 to 33 million in 2050, while assuming near zero net-migration from the year 2028 onwards following a period of refugee emigration in 2022 and immigration from returnees over a five year span. With zero net-migration long-term, these projections do not reflect variation in the potential demographic impact of migration circumstantiated by different possible scenarios of the geopolitical and economic future of Ukraine.

Widening the assumptions on possible migration trends is necessary to provide policy-makers with a nuanced picture of how migration could impact Ukraine's population future. The underestimation of the recent emigration of young Ukrainians leaving the country to work abroad or fleeing conflict already prior to the invasion on 24 February 2022, especially to Poland (see chapter 1), and new developments such as Ukraine receiving an EU candidate status signal the significant role migration has already played and is likely to continue to play in the future. However, it is impossible to project migration trends with much accuracy over the long term. Compared to the two other drivers of demographic change - fertility and mortality -, which change slowly over time, migration is much more uncertain, volatile and complex⁶⁶. Therefore, this chapter develops qualitative scenarios spanning a range of possible migration futures that are translated into population projections.

The strength of outlining migration scenarios is that they can put "uncertainties and discontinuities at the centre of attention and thereby facilitate long-term, high-level strategic decision-making"⁶⁷. An early study of the impact of the war using scenarios, that assumed a maximum of half of the current number of people that have fled Ukraine and did not include variability in post-war migration futures, indicated considerable acceleration in population decline over the short and medium term⁶⁸. The aim of this report is not to predict the future but to anticipate how the international displacement after the Russian invasion, return migration, and future migration trends could influence the size and the composition of Ukraine's population over the coming decades.

4.1 International displacement outlook

As shown in Chapter 2 (pp. 12), the number of new refugees from Ukraine recorded by UNHCR reduced from October 2022. It fluctuated at 7.9 million from mid-November and even slightly decreased to 7.83 million in the first week of December 2022. However, the international displacement caused by the Russian aggression against Ukraine is linked to many uncertainties, which depend on the evolving character and length of the war. At country level, drivers such as the harshness of the winter season, a potential intensification of the war, and

⁶¹ Sohst R, Tjaden J, de Valk H and Melde S (2020) *The Future of Migration to Europe: A Systematic Review of the Literature on Migration Scenarios and Forecasts*. International Organization for Migration, Geneva, and the Netherlands Interdisciplinary Demographic Institute, the Hague.

⁶² European Commission (2019) *Progress report on the implementation of the European Agenda on Migration*. Communication from the Commission to the European Parliament, the European Council and the Council. COM(2019) 481 final, Brussels, 16.10.2019.

⁶³ European Commission (2020) *A fresh start on migration: Building confidence and striking a new balance between responsibility and solidarity*. Press release, Brussels, 23.09.2020.

⁶⁴ Billari FC (2022) Demography: Fast and Slow. *Population and Development Review*, 48: 9-30.

⁶⁵ Raymer J and O'Donnell J (2021) The Demography of Migration. In: K Kourtit et al (eds.) *The Economic Geography of Cross-Border Migration*, Footprints of Regional Science, Springer.

⁶⁶ Bijak J and Czaika M (2020) *Assessing Uncertain Migration Futures – A Typology of the Unknown*. QuantMig Project Deliverable D1.1. University of Southampton and Danube University Krems.

⁶⁷ Sohst et al (2020)

⁶⁸ Kulu H et al (2022) *The War and the Future of Ukraine's Population*. University of St Andrews, School of Geography and Sustainable Development, published 13.03.2022.

destruction of infrastructure could lead to the number of refugees rising again. At individual level, the drivers of further refugee movements are linked to the stability of the security situation in specific regions of Ukraine, work opportunities, the access to basic services and goods, reconstruction of houses and infrastructure, and the access to education⁶⁹. Another strong factor is family separation, which could work in both ways, as a reason to leave or a reason to return to Ukraine. Socio-economic integration in countries of destination and their regulatory frameworks, for example the extension of the Temporary Protection Directive or other measures providing longer-term perspectives to stay, also play a role.

The 11th round of the IOM General Population Survey on the reported intentions to migrate, carried out in November 2022, give an estimate of 143 000 persons in Ukraine that actively consider relocating to the EU⁷⁰. This corresponds to only 20% of all respondents. Among the persons who are already displaced internally, who consider relocating again, only 11% expressed an intention to move abroad. Generally, the intention to relocate either internally or abroad is very low, despite the arrival of winter and the Russian attacks on power supply and heating infrastructure. Only 7% of the surveyed persons nationwide actively consider to relocate (though survey responses on the intentions to migrate are an imperfect indicator of later migration behaviour and should be interpreted with caution).

4.2 Post-war migration outlook

Two global processes - economic development reducing inequality between countries and multilateral agreements and cooperation - are thought to have the most impact on future migration, when producing migration scenarios⁷¹. In the context of Ukraine, this highlights the importance of the economic recovery and long-term economic developments and of the political rapprochement with the EU, a major destination for emigrants from Ukraine. As described in Chapter 1, labour migration from Ukraine to the EU increased steadily before the Russian invasion. With a strong labour demand, a shrinking workforce in many MS, and considerably higher wages, the EU is likely to attract Ukrainian workers⁷². Furthermore, the growing Ukrainian diaspora encourages migration in the future, not just for work purposes, but also for reasons linked to family and education. Labour and other types of migration were facilitated by the measures granting visa free entry for Ukrainians to the EU in 2017 and those improving access to MS labour markets such as in Poland. The Temporary Protection Directive eased immigration from Ukraine to the EU, and the accession of Ukraine to the EU with its enhanced free movement rights would facilitate it further.

Multiple studies have shown that becoming an EU Member State accelerates emigration. In particular, the EU enlargement waves in 2004, 2007 and 2013 increased bilateral migration movements from Eastern Europe to Western Europe⁷³. The increase in emigration was accompanied by more fluid dynamics of migration.

Similarly to enlargement, the pre-war migration (both temporary and circular migration and permanent emigration) from Ukraine to the EU increased thanks to a series of institutional measures. The recent trend of Ukrainians migrating to Poland indicates that the share of permanent and longer-term migration to Poland was increasing, compared to temporary and circular movements⁷⁴.

Poland, Czechia and Hungary transitioned from emigration countries to immigration countries over the course of two decades after joining the EU. Like Ukraine, they also experienced rapid population ageing, high emigration of young adults and low fertility, but have managed to maintain a steady economic growth⁷⁵. Swift economic recovery following the war will be the precondition for Ukraine to follow their path.

Many European countries have made the shift from net-losing to net-receiving country, even if in very different contexts. France and Switzerland became receiving countries in the 1950s, followed by Belgium, Germany, the Netherlands and Sweden. In the early 21st century, almost all Western and Southern European countries

⁶⁹ EUAA, IOM and OECD (2022) *Forced displacement from and within Ukraine: Profiles, experiences, and aspirations of affected populations*. Joint EUAA, IOM and OECD Report. Date of release: 28.10.2022.

⁷⁰ IOM (2022) *Ukraine internal displacement report*. General Population Survey. Round 11, 25 November to 5 December 2022.

⁷¹ Sohst et al (2020)

⁷² Pienkowski J (2020) The Impact of Labour Migration on the Ukrainian Economy. *European Economy Discussion Paper 123*, April 2020, Directorate-General for Economic and Financial Affairs, European Commission.

⁷³ Bossavie L et al (2022) *Skilled Migration: a Sign of Europe's Divide or Integration?* International Development in Focus, World Bank.

⁷⁴ Jaroszewicz M (2018) *Migration from Ukraine to Poland: The Trend Stabilises*. Centre for Eastern Studies, OSW Report, Warsaw, October 2018.

⁷⁵ Vakhitova H and Fihel A (2020) International Migration from Ukraine: Will Trends Increase or Go into Reverse? *Central and Eastern European Migration Review*, 9(2).

registered more immigration than emigration⁷⁶. Now Central and Eastern European countries are starting to make the transition. Ukraine did small steps in that direction before the war by adopting a State Migration Policy and Strategy in 2017, which addresses the attraction of skilled labour and foreign students besides other relevant topics such as return and reintegration and diaspora cooperation⁷⁷.

4.3 Rationale of migration scenarios

Four exploratory *what-if* scenarios⁷⁸ were simulated combining assumptions about the extent of the refugee movement caused by the war, return migration in the context of future recovery and reconstruction, and a set of longer-term migration trends. The narratives of the scenarios try to capture a wide, yet plausible range of possible futures, from a pessimistic scenario of a longer war, protracted conflict and slow economic recovery following the war to an optimistic scenario of a shorter war and swift post-war recovery bringing long-term social and political stability and economic growth.

- 1) **Long War and Low Return:** The scenario assumes a long, intensive war that causes international displacement numbers to rise again, leads to low return of refugees, and delays economic recovery and reconstruction. Ukraine remains a country of emigration and a high share of the migration after the war is of permanent character. The return migration rate is low.
- 2) **Permanent Emigration:** The scenario assumes short war with the majority of Ukrainian refugees returning in the next decade. Following the war, Ukraine remains a country of emigration with slow economic recovery. A high share of future emigration is permanent and return rates are low.
- 3) **Circular Migration:** The scenario assumes a short war with the majority of Ukrainian refugees returning in the next decade. Ukraine remains a country of emigration with slow economic recovery. However, post-war migration is characterised by a high share of circular migration enabled by changed institutional settings in the major destination countries in the EU. Return rates are high.
- 4) **Migration Transition:** The scenario assumes a short war with the majority of Ukrainians returning. With strong support from international partners, Ukraine recovers from the war and experiences economic growth and political and social stability. There is a high demand for labour that generates significant recruitment of foreign workers supported by a proactive migration policy. The country follows the path of some other Eastern European countries and transitions from a net-losing to a net-receiving country of migrants in the 2030s. Return rates are high.

4.4 Quantifying the scenarios for population projections

A multidimensional population model is used to translate the qualitative migration scenarios in projections of the future population of Ukraine. The model produces population projections from the beginning of the Russian invasion in early 2022 to the year 2052 in five-year intervals. The components of demographic change (fertility, mortality and migration) are projected individually. The population at the beginning of the Russian invasion is advanced in five-year age groups over the projection period of 30 years. The migration component is separated into four elements to analyse the impact of international displacement, refugee return, post-war migration and migrant return (

The size of the refugee movement triggered by the Russian military aggression against Ukraine is set to eight million in the scenarios of *Permanent Emigration*, *Circular Migration* and *Migration Transition*, under the assumption that the war will be relatively short and remain concentrated in Eastern Ukraine. Seen from today's perspective, there are some indications that the size of the internationally displaced population has reached its peak. The number of refugees recorded abroad levelled off at the end of 2022 and return migration is already sizeable. Survey findings also showed a high intention to stay in the country among the population that had remained in the country. Only 7% of respondents nationwide were actively considering relocation (inside or outside Ukraine) despite the onset of winter temperatures and the Russian attacks on power supply and heating

⁷⁶ Skeldon R (2013) *Global Migration: Demographic Aspects and its Relevance for Development*. Technical Paper No. 2013/6. United Nations, Department of Economic and Social Affairs, Population Division.

⁷⁷ Malynovska O (2020) International Migration of the Ukrainian Population since Independence. In: M Denisenko, S Strozza and M Light (eds.), *Migration from the Newly Independent States, Societies and Political Orders in Transition*, Springer Nature: Switzerland.

⁷⁸ A review of methodology for migration scenarios can be found in: Boissonneault M et al (2020) *QuantMig: The use of migration scenarios in future characterisations: A systematic review and typology*. Netherlands Interdisciplinary Demographic Institute (NIDI-KNAW)/University of Groningen.

infrastructure. There is also a demographic limit in the number of refugees that could leave the country. Up to 40% of young adult women and children are already outside of Ukraine. The share is much higher in the regions affected by intense military action. Hence, only the most pessimistic scenario of *Long War and Low Return*, which assumes a re-intensification of the war and an expansion in the affected geographical areas, implies a continued increase in the size of the internationally displaced population to 9 million.

Figure 7):

The size of the refugee movement triggered by the Russian military aggression against Ukraine is set to eight million in the scenarios of *Permanent Emigration*, *Circular Migration* and *Migration Transition*, under the assumption that the war will be relatively short and remain concentrated in Eastern Ukraine. Seen from today’s perspective, there are some indications that the size of the internationally displaced population has reached its peak. The number of refugees recorded abroad levelled off at the end of 2022 and return migration is already sizeable. Survey findings also showed a high intention to stay in the country among the population that had remained in the country. Only 7% of respondents nationwide were actively considering relocation (inside or outside Ukraine) despite the onset of winter temperatures and the Russian attacks on power supply and heating infrastructure⁷⁹. There is also a demographic limit in the number of refugees that could leave the country. Up to 40% of young adult women and children are already outside of Ukraine. The share is much higher in the regions affected by intense military action. Hence, only the most pessimistic scenario of *Long War and Low Return*, which assumes a re-intensification of the war and an expansion in the affected geographical areas, implies a continued increase in the size of the internationally displaced population to 9 million.

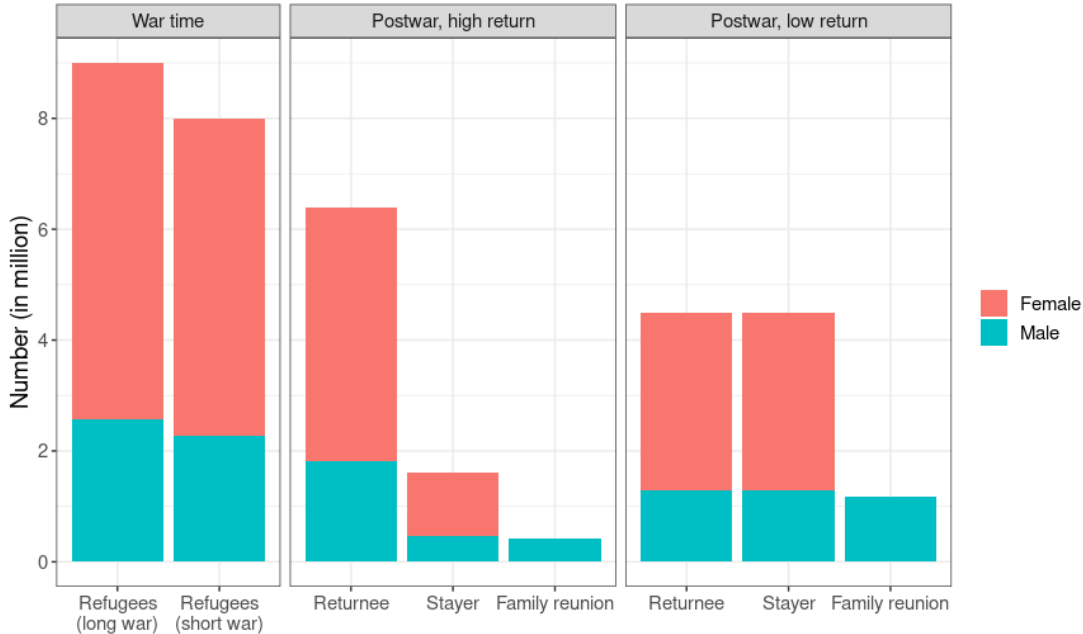
Figure 7 Parameters of migration scenarios: length of the war and type of migratory movement. Red colour for more pessimistic and green for more optimistic assumptions on the role of migration for population change.

| | | Long War and Low Return | Permanent Emigration | Circular Migration | Migration Transition |
|-----------------------|--|--|---|--|--|
| End of the war | | Long war over five year period | Short war ending in 2023 | Short war ending in 2023 | Short war ending in 2023 |
| Migration | Size of emigration after Russian invasion | Renewed emigration and increase to 9 million | Small increase to 8 million | Small increase to 8 million | Small increase to 8 million |
| | Return rate of refugees | 50% will return following the end of the war | 80% will return following the end of the war | 80% will return following the end of the war | 80% will return following the end of the war |
| | Size of post-war migration | High emigration as the country’s economy recovers slowly. High share of permanent emigration. | High emigration as the country’s economy recovers slowly. Migration characterised by permanent emigration. | High emigration as the country’s economy recovers slowly. Future migration characterised by circular migration. | Gradual decrease of emigration levels and transition to net-receiving country due to economic recovery and future growth |
| | Return rate of migration | 35% return within five years after migration; 75% within 30 years | 35% return within five years after migration; 75% within 30 years | 65% return within five years after migration; 95% within 30 years | 65% return within five years after migration; 95% within 30 years |

⁷⁹ IOM (2022) *Ukraine internal displacement report*. General Population Survey. Round 11, 25 November to 5 December 2022.

The return rate of refugees following the war is set to 50% in the *Long War and Low Return* scenario and to 80% in the other three scenarios. This would be in the magnitude of the average return rate from the last large-scale refugee movement in Europe. It has been estimated that 75% of the refugees displaced during the civil wars in former Yugoslavia returned to their countries of origin⁸⁰, and that a higher overall return rate was dampened by the protracted conflict in Kosovo⁸¹. The imbalance women and men in the Ukrainian refugee population in Europe, with mostly women and children leaving the country, is a specific characteristic of the international displacement caused by the Russian invasion. Taking into account that many women had their partners staying behind in Ukraine, the possibility of family reunification is added to the estimate of the refugee population. It is assumed that the women who do not return to Ukraine are joined by their partners (Marital status proportions are not adjusted for casualties from the war as information on mortality is very limited). This is estimated from data on marriage patterns from the United Nations that provide the number of women that have a partner by five-year age group⁸². The additional number of men leaving Ukraine is about 350 000 under the assumption of high refugee return. It grows to about 850 000 under the assumption of low refugee return given that a higher number of women remain abroad and are joined by their partners.

Figure 8 Estimates of refugee population movement used in scenarios: Number of refugees and post-war number of returnees, refugees staying abroad and of family reunification of Ukrainian men joining their partners abroad. Source: Authors' estimates based on UNHCR, Eurostat and ISTAT information on size and composition of refugee population and United Nations Population Division information on marital status by age and sex.



The size of post-war migration is based on assumptions of the number of emigrants and the number of immigrants, whereby the latter is the combination of new arrivals and returnees. Emigration is set to return to the high level estimated for the years immediately before the Russian invasion, with 220 000 people leaving Ukraine annually in all scenarios, except for the *Migration Transition* scenario. In this scenario, emigration is assumed to steadily decline over 30 years, dropping to only 30 000 people leaving the country annually. Immigration is set to the pre-war level of 25 000 arrivals of new residents. In the *Migration Transition* scenario, this number doubles between 2030 and 2040 and then remains at that level. The number of returnees is added by applying a return rate to the annual number of emigrants. It takes into account previous emigration numbers starting in 2000, with a break in return migration during the war. The return rate is set to 75% over the course

⁸⁰ Bahar D et al (2019) Migration and post-conflict reconstruction: The effect of returning refugees on export performance in the Former Yugoslavia. *IZA Discussion Paper Series*, IZA Discussion Paper No. 12412, June 2019 Institute of Labor Economics.

⁸¹ UNHCR (2005) The Balkans: After the war was over. *Refugees* 3(140). United Nations High Commissioner for Refugees.

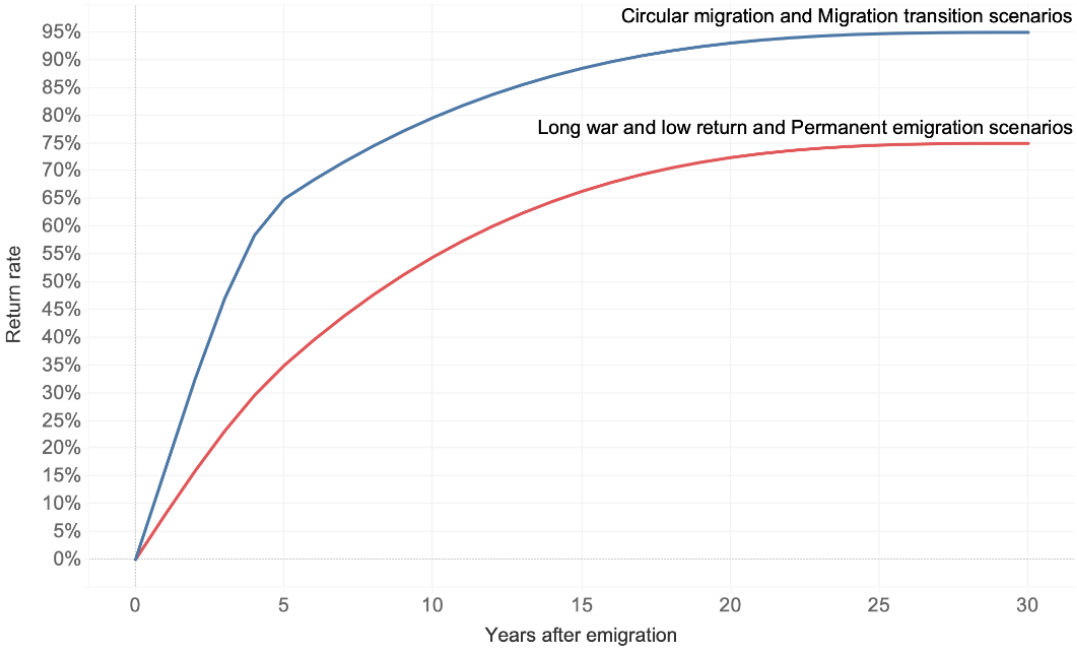
⁸² United Nations, Department of Economic and Social Affairs, Population Division (2019) *World Marriage Data 2019* (POP/DB/Marr/Rev2019).

of 30 years (35% return within the first five years) in the *Long War and Low Return* and *Permanent Emigration* scenarios. It is set to 95% within 30 years (65% return within the first five years) in the *Circular Migration* and *Migration Transition* scenarios (Besides information on migration, population projections require assumptions about future fertility and mortality. The same fertility and mortality levels are applied across all scenarios, as the focus of this report is to analyse the impact of migration on population change in Ukraine. The rates are based on the medium projections of mortality and fertility in the United Nations World Population Prospects (2022). The UN projections were published in June 2022, several months after the start of the Russian invasion. The mortality and fertility assumptions already take into account the short- and long-term impact that the war could have on the number of births and deaths. The information on mortality and fertility is limited as data on deaths are not only challenging to collect, but their publication is also politically sensitive and covered by state secret. It can be assumed that there are numerous military and civilian casualties and that the Russian aggression against Ukraine will have lasting consequences not only in terms of physical injuries but also in terms of psychological trauma, lack of medical supplies and limited access to health services.

Figure 9). The return rates reflect findings from a study that reviewed the literature on return rates dependent on time since immigration⁸³.

Besides information on migration, population projections require assumptions about future fertility and mortality. The same fertility and mortality levels are applied across all scenarios, as the focus of this report is to analyse the impact of migration on population change in Ukraine. The rates are based on the medium projections of mortality and fertility in the United Nations World Population Prospects (2022). The UN projections were published in June 2022, several months after the start of the Russian invasion. The mortality and fertility assumptions already take into account the short- and long-term impact that the war could have on the number of births and deaths. The information on mortality and fertility is limited as data on deaths are not only challenging to collect, but their publication is also politically sensitive and covered by state secret. It can be assumed that there are numerous military and civilian casualties and that the Russian aggression against Ukraine will have lasting consequences not only in terms of physical injuries but also in terms of psychological trauma, lack of medical supplies and limited access to health services⁸⁴.

Figure 9 Return rates for regular migration considered in the four scenarios.

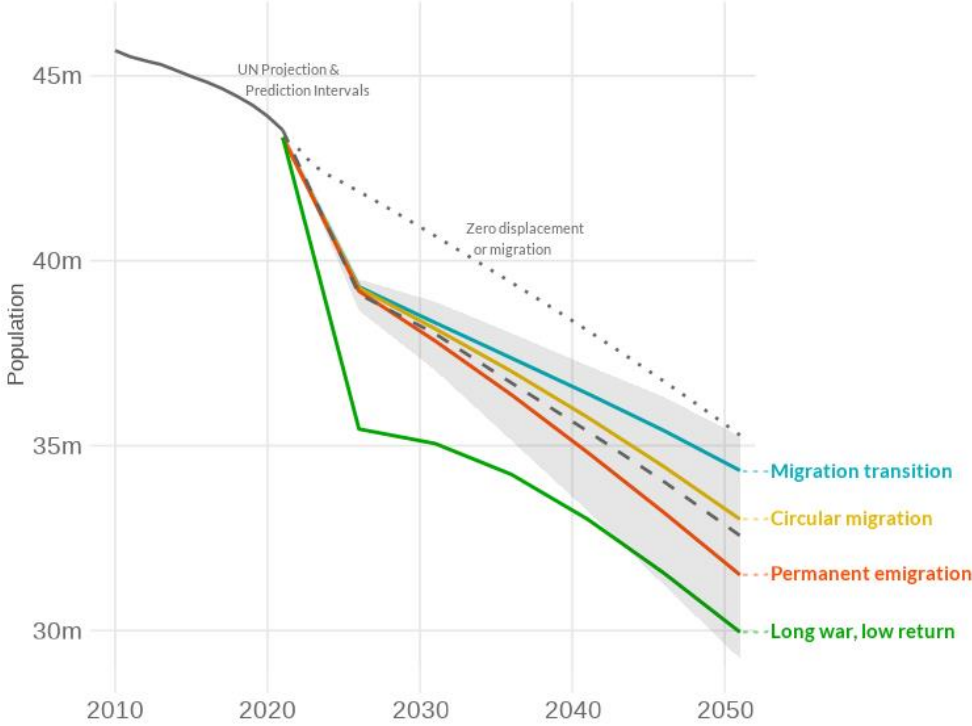


⁸³ Dustmann C and Goerlach JS (2016) The Economics of Temporary Migrations. *Journal of Economic Literature* 54(1): 98-136.
⁸⁴ Kurylo I (2022) Tendencies of mortality and life expectancy in Ukraine before the Russian full scale military invasion. *Economy and Sociology*, June (1).

4.5 Impact of migration on population size

The population projections of the different scenarios show the strong impact of the migratory movements on the future size of the Ukrainian population (Figure 10). International displacement immediately accelerates the pace of population decline. In the scenarios that foresee 8 million refugees and a return of rate of 80%, the population falls by over four million people, dropping to just over 39 million by 2027 (the graph does not show a steeper drop or recovery because of the five-year projection interval, with the interval 2022 to 2027 already accounting for the return of refugees). In the *Long War and Low Return* scenario, which foresees 9 million refugees and a return rate of only 50%, Ukraine’s population loses nearly 8 million people and decreases to 35.4 million by 2027. The strong impact of migration on the population is shown by the difference between the scenario trend lines and the dotted trend line of a projection with zero international displacement or migration, but with the same fertility and mortality levels. If it were only for the projected changes in fertility and mortality, the population would have declined by only 1.4 million, dropping to 41.6 million in 2027.

Figure 10 Scenarios of the population size of Ukraine depending on international displacement, return migration, and longer-term migration trends, 2020 to 2050. The graph shows five-year estimates starting from 2022. The first projection interval from 2022 to 2027 already includes a high number of refugees that have returned to Ukraine. The shaded area shows the 95% prediction interval around the United Nations Median projection. The dotted line shows a projection with displacement and migration set to zero. Sources: Authors’ calculations and United Nations Population Division World Population Prospects 2022 Revision.



Over the longer term, the impact of post-war migration patterns emerges and creates a significant difference across the scenarios in population size by the year 2052. The gradual decrease of emigration, high return rate of migrants, and transition to a net-receiving country decelerates the pace of population decline. Although the population size in the *Migration Transition* scenario approaches the size of the population by 2052 that would be projected under the assumptions that there was no displacement from war and zero net-migration in the future, the *Migration Transition* scenario still entails a population decline by 9 million people, down to 34.3 million in 2052 (Table 1). In the *Circular Migration* scenario, continuous high emigration leads to a decline by 10.3 million people, and the population falling to 33 million. The *Permanent Migration* scenario shows the impact of a lower return rate. Compared to the *Circular Migration* scenario, the population decreases by an additional 1.5 million people and drops to 31.5 million by 2052. The population declines to 29.9 in the *Long War and Low Return* scenario.

Table 1 Population change from January 2022 to 2052 by scenario

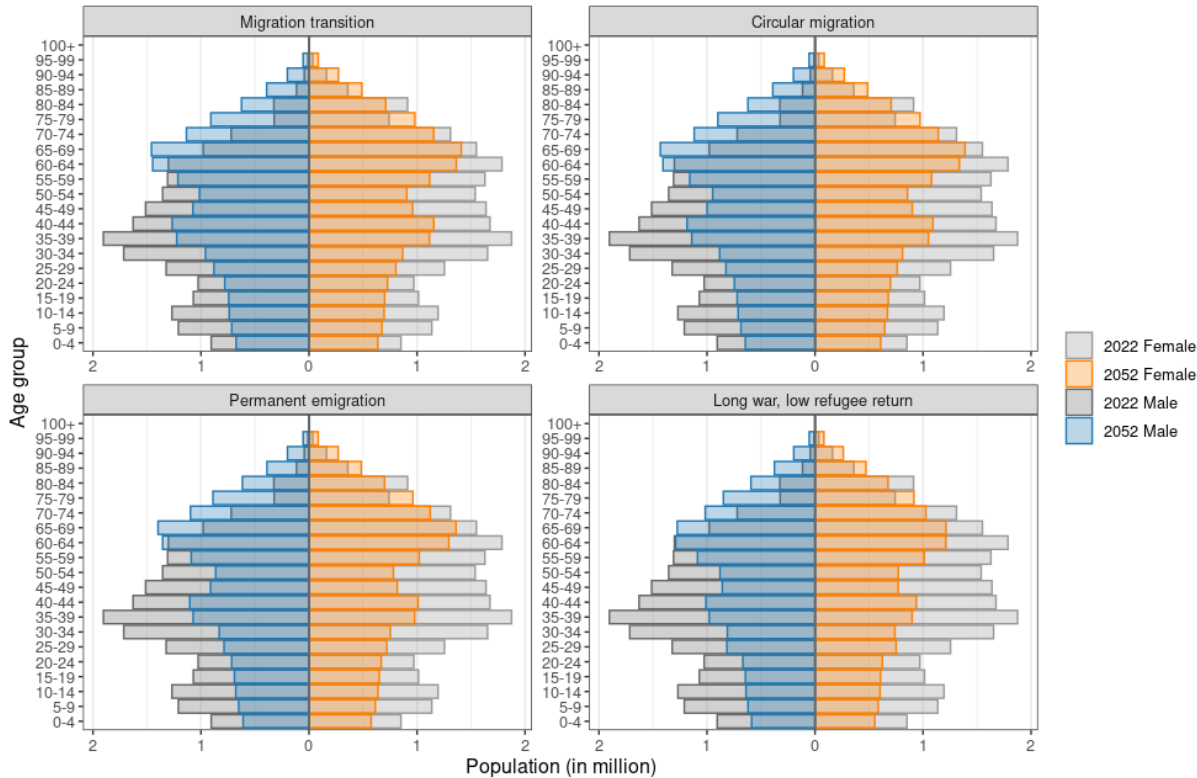
| Scenario | Population (million) | | | Absolute change (million) | Relative change (%) |
|-------------------------|----------------------|------|------|---------------------------|---------------------|
| | 2022 | 2027 | 2052 | | |
| Long War and Low Return | 43.3 | 35.4 | 29.9 | -13.4 | -31% |
| Permanent Emigration | 43.3 | 39.2 | 31.5 | -11.8 | -27% |
| Circular Migration | 43.3 | 39.3 | 33.0 | -10.3 | -24% |
| Migration Transition | 43.3 | 39.3 | 34.3 | -9.0 | -21% |

Across the four scenarios, the decline in population over 30 years ranges from 21% under the *Migration Transition* scenario to 31% under the *Long War and Low Return* scenario. They extend towards the edges of the prediction interval of the probabilistic projections of the United Nations, which present an assessment of the uncertainty in the medium projection (Figure 10). However, only fertility and mortality are projected probabilistically. Migration enters the UN projections deterministically with a fixed net-migration trend. For Ukraine, the balance of emigration and immigration in the decades following the war is assumed to be almost zero and negligible in the UN projections. The difference of 4 million people in population decline across the scenarios almost matches the uncertainty in the UN projections, suggesting that migration will be similarly important as fertility and mortality in driving population change in Ukraine following the war.

4.6 Impact of migration on population structure

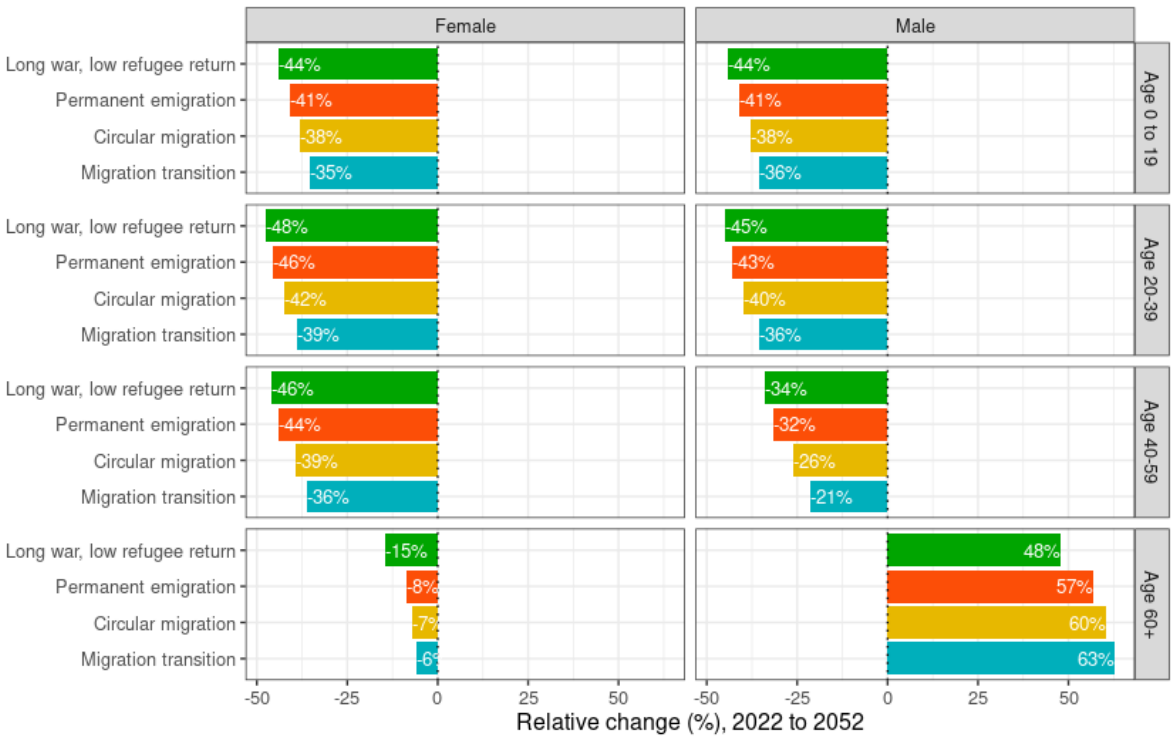
Besides the strong decline, a rapid ageing of Ukraine’s population is evident from the changes in the age structure across all scenarios. An overlay of the age and sex composition at the beginning of the Russian invasion and in the year 2052 shows much smaller cohorts of people of working age and of children (Figure 11). International displacement and high emigration are strong contributors to the shrinking of the cohorts that correspond to adult working age in 2052. The small cohorts of children and young adults in 2052 are explained mostly by continuously low fertility.

Figure 11 Comparison of the age and sex composition of Ukraine’s population before the Russian invasion in 2022 and in 2052 by migration scenario. Source: Authors’ calculations and United Nations Population Division



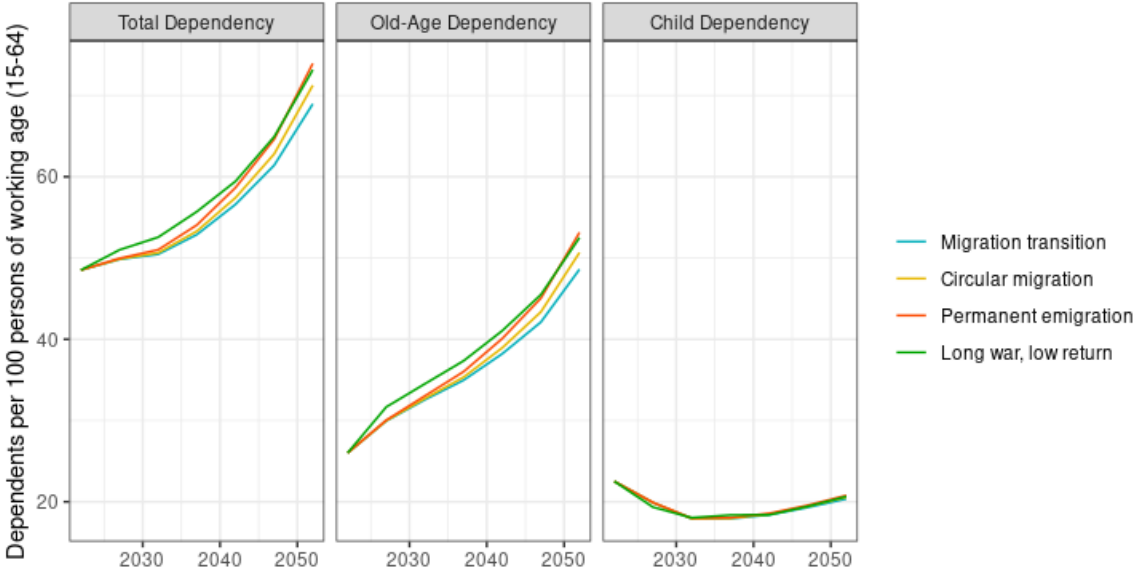
To better identify differences across scenarios, Figure 12 illustrates the differences in the size of the broad age groups in 2052, compared to before the Russian invasion in 2022. In 2052, the population under 20 years of age is only a third of the size of the same age group in 2022 in the most optimistic scenario of a *Migration Transition* towards a net-receiving country. In the most pessimistic *Long War and Low Return* scenario, there is a decrease of 43% in the number of persons under the age of 20 by 2052. The biggest difference is recorded among people of 20 to 39 years of age, and the decline among women is slightly bigger than among men. The difference is equally strong for women of 40-59 years of age; the size of the age group is expected to decrease by 36% to 46% by 2052. For men, the decrease in the 40-59 age-group is smaller, reflecting the sex imbalance in the refugee population of today. The male population above the age of 60 is projected to increase in size by almost half even under the most pessimistic scenario, while the female population is projected to decrease between 6% and 15%. This is due to the current age structure with a significant numeric advantage of women in the age cohorts above 60 years. This is explained by the previously low and stagnant life-expectancy for men which started to increase in the last decade and is projected to continue to do so over the long term following temporary setbacks from the COVID-19 pandemic and the war. Therefore, there is a much higher number of men arriving in the older age groups.

Figure 12 Relative change in broad age groups between 2022 (before the Russian invasion) and 2052, by migration scenario



Dependency ratios are an indicator of the potential challenges arising from an ageing and declining population. The total dependency ratio is the sum of the youth dependency ratio (the ratio of children under the age of 15 to the working age population (15-64)) and the old age dependency ratio (the ratio of people above the age of 65 to the working age population). The total dependency ratio can be used to assess the potential social support needs stemming from the changes in population structure. In the case of Ukraine, the number of dependents per working age population is projected to increase in all scenarios from just under 50 dependents per 100 persons of working age, to around 70 dependents per 100 persons of working age. The increase will only be felt in the early 2030s because of the high number of children leaving the country today because of the war. The child dependency ratio is projected to decrease in the first ten years, before going up slightly again to a ratio of about 20 children per 100 persons of working age in 2052. Therefore, the overall rise in total dependency is driven almost entirely by the increase in old age dependents. The impact of migration is relatively small. In 2052, there are 48 old age dependents for 100 persons of working age in the *Migration Transition* scenario, against 52 in the *Long War and Low Return* scenario.

Figure 13 Dependency ratios 2022 to 2052 by migration scenario



5 Conclusion

The goal of this report was to analyse how international displacement triggered by the Russian invasion of Ukraine has altered the demography of Ukraine, and to anticipate how post-war migration could impact the future population of Ukraine. The war is a shock to all demographic dynamics: fertility, mortality, and migration. The focus of this report was on migration in the context of the possible effects of the unprecedented displacement caused by the Russian military aggression that has led to nearly 8 million people being internationally displaced from Ukraine by the end of year 2022.

The findings of the report show that migration is as important a factor as mortality and fertility for the longer-term future of Ukraine's population. The population of Ukraine was already declining for three decades before the war, and the waves of emigration played a big role in addition to very low levels of fertility. This decline has been accelerated by the international displacement triggered by the Russian invasion. Especially women of working age and children have left the country, with more than a third internationally displaced. A continued decline in population over the next decades appears irreversible, even in the case that Ukraine recovers quickly and strongly after a short war and becomes a net-receiving country of international migrants.

This comes with the challenge of rapid population ageing and a declining workforce. Reconstruction efforts, support for long-term recovery, and socio-economic and political developments in the context of a possible accession to the EU will influence return migration and future migration patterns, which could lead to the country losing a fourth to a third of its population by mid-century. This decline is concentrated in the population under the age of 60. In fact, the population over the age of 60 is set to increase over the next decades as a result of the current age structure of the Ukrainian population that will see a large number of men arriving in retirement age. Under all scenarios, potential social support demands on the working age population increase sharply and are driven by the relative increase in older age groups.

In this report, we did not assess uncertainty in future fertility and mortality trends in the projection scenarios. Data on civilian and military casualties, as well as birth statistics, are still very limited. We applied the latest United Nations medium estimates and projections of mortality and fertility that include assumptions on the effects of the war. Furthermore, the United Nations' projections give predictive ranges of long-term trends in mortality and fertility which are based on a probabilistic model for these components. However, the migration component in the UN projections is modelled deterministically and does not provide different possible future trends. This report addressed this gap in the analysis of Ukraine's population future.

The projection scenarios signal the need to envisage strategies on issues such as long-term care, life-long learning, intergenerational fairness, migrant reintegration, or diaspora engagement to address the rapid ageing of the population and the loss of human capital. Furthermore, understanding the scope of possible futures of the Ukraine's population and their variability can help to make informed decisions about the allocation of support in line with the country's needs.

Bibliography

- Bahar D et al (2019) Migration and post-conflict reconstruction: The effect of returning refugees on export performance in the Former Yugoslavia. *IZA Discussion Paper Series*, IZA Discussion Paper No. 12412, June 2019 Institute of Labor Economics.
- Bijak J and Czaika M (2020) Assessing Uncertain Migration Futures – A Typology of the Unknown. QuantMig Project Deliverable D1.1. Southampton / Krems: University of Southampton and Danube University Krems.
- Billari FC (2022) Demography: Fast and Slow. *Population and Development Review*, 48: 9-30.
- Boissonneault M et al (2020) QuantMig: The use of migration scenarios in future characterisations: A systematic review and typology. Netherlands Interdisciplinary Demographic Institute (NIDI-KNAW)/University of Groningen.
- Bossavie L et al (2022) *Skilled Migration: a Sign of Europe's Divide or Integration?* International Development in Focus, World Bank.
- Dipartimento della Protezione Civile – Team Dati (2022) Dati generati dalla piattaforma contributi di sostentamento e dal Ministero dell'Interno. Dati: <https://github.com/pcm-dpc/UKR-2022/tree/master/data/subsistence-allowance>
- Dustmann C and Goerlach JS (2016) The Economics of Temporary Migrations. *Journal of Economic Literature* 54(1): 98-136.
- EUAA (2022) *Ukraine Crisis: Data and Analysis*. EU Agency for Asylum. <https://euaa.europa.eu/ukraine-crisis-data-and-analysis>
- EUAA, IOM and OECD (2022) *Forced displacement from and within Ukraine: Profiles, experiences, and aspirations of affected populations*. Joint EUAA, IOM and OECD Report. Date of release: 28.10.2022.
- European Commission (2019) *Progress report on the implementation of the European Agenda on Migration*. Communication from the Commission to the European Parliament, the European Council and the Council. COM(2019) 481 final, Brussels, 16.10.2019.
- European Commission (2020) *A fresh start on migration: Building confidence and striking a new balance between responsibility and solidarity*. Press release, Brussels, 23.09.2020.
- European Commission (2022) Council implementing decision: establishing the existence of a mass influx of displaced persons from Ukraine within the meaning of Article 5 of Council Directive 2001/55/EC of 20 July 2001, and having the effect of introducing temporary protection. Brussels, 02.03.2022, COM(2022) 91 final, 2022/0069 (NLE).
- European Commission (2022) Ukraine: Commission proposes temporary protection for people fleeing war in Ukraine and guidelines for border checks. Press release, 2 March 2022, European Commission, Brussels. URL: file:///C:/Users/ueffikl/AppData/Local/Temp/1/Ukraine_Commission_proposes_temporary_protection_for_people_fleeing_war_in_Ukraine_and_guidelines_for_border_checks.pdf
- European Council (2022) European Council conclusions on Ukraine, the membership applications of Ukraine, the Republic of Moldova and Georgia, Western Balkans and external relations, 23 June 2022. European Council, Council of the EU, Press Releases, European Council Conclusions 23 June 2022. URL: <https://www.consilium.europa.eu/en/press/press-releases/2022/06/23/european-council-conclusions-on-ukraine-the-membership-applications-of-ukraine-the-republic-of-moldova-and-georgia-western-balkans-and-external-relations-23-june-2022/>
- Eurostat (2022) *Data browser: Decisions granting temporary protection by citizenship, age and sex – monthly data* (online data code: MIGR_ASYTPFM). Data until end of October.
- Eurostat (2022) *Online Data Browser*. Data code MICR_RESVALID: All valid permits by reason, length of validity and citizenship on 31 December of each year.
- Federal Institute for Population Research (2022) *Geflüchtete aus der Ukraine in Deutschland: Flucht, Ankunft und Leben*. Dezember 2022
- Finotelli C and Arango J (2011) Regularisation of Unauthorised Immigrants in Italy and Spain: Determinants and Effects. *Documents d'Analisi Geografica* 57(3): 495–515.
- Frejka T and Gietel-Basten S (2016) Fertility and Family Policies in Central and Eastern Europe after 1990. *Comparative Population Studies*, 41(1).
- Government of Canada (2022) *Ukraine immigration measures: Key figures*. URL: <https://www.canada.ca/en/immigration-refugees-citizenship/services/immigrate-canada/ukraine-measures/key-figures.html>
- IDMC (2022) *Displacement Data, Ukraine*, Internal Displacement Monitoring Centre, online database.
- International Labour Organisation (2013) *Report on the Methodology, Organization and Results of a Modular Sample Survey on Labour Migration in Ukraine*. URL: <https://www.ilo.org/budapest/what-we->

- [do/publications/WCMS_244693/lang--en/index.htm](https://publications/wcms_244693/lang--en/index.htm)
http://csv2.ukrstat.gov.ua/druk/publicat/kat_u/2017/bl/12/bl_ztm_2017.zip
- IOM (2022) *Ukraine Internal Displacement Report: General Population Survey*. Multiple rounds: Round 8 (17–23 of August 2022), Round 9 (26 September 2022), Round 10 (27 October 2022) and Round 11 (25 November 2022).
- Jaroszewicz M (2018) *Migration from Ukraine to Poland: The Trend Stabilises*. Centre for Eastern Studies, OSW Report, Warsaw, October 2018.
- Kindler M, Kordasiewicz A and Szulecka M (2016) *Care needs and migration for domestic work: Ukraine–Poland*. Global Action Programme on Migrant Domestic Workers and their Families, an ILO/UE project. International Labour Office, Geneva, ILO 2016.
- Kulu H et al (2022) *The War and the Future of Ukraine’s Population*. University of St Andrews, School of Geography and Sustainable Development, published 13.03.2022.
- Kurylo I (2022) *Tendencies of mortality and life expectancy in Ukraine before the Russian full-scale military invasion*. *Economy and Sociology*, June (1).
- Levchuk N (2009) *Alcohol and mortality in Ukraine*. MPIDR Working Paper 2009-17. Max-Planck-Institut for Demographic Research.
- Malynovska O (2020) *International Migration of the Ukrainian Population since Independence*. In: M Denisenko, S Strozza and M Light (eds.), *Migration from the Newly Independent States, Societies and Political Orders in Transition*, Springer Nature: Switzerland.
- Malynovska O (2020) *International Migration of the Ukrainian Population since Independence*. In: M Denisenko, S Strozza and M Light (eds.), *Migration from the Newly Independent States, Societies and Political Orders in Transition*, Springer Nature: Switzerland.
- Mesle F and Vallin J (2012) *Mortality and Causes of Death in 20th-Century Ukraine*, Demographic Research Monographs, Springer Science.
- Perelli-Harris B, Hilevich Y and Gerber T (2021) *Uncertainty across the “Contact Line”: armed conflict, COVID-19, and perceptions of fertility decline in Eastern Ukraine*. Paper presented at the European Population Conference 2022, 29 June to 2 July, Groningen, Netherlands.
- Pienkowski J (2020) *The Impact of Labour Migration on the Ukrainian Economy*. *European Economy Discussion Paper* 123, April 2020, Directorate-General for Economic and Financial Affairs, European Commission.
- Pozniak O (2012) *Statistical data collection on migration in Ukraine*. European University Institute, CARIM East – Consortium for Applied Research on International Migration, Explanatory Note 12/02, Demographic and Economic Module.
- Raymer J and O’Donnell J (2021) *The Demography of Migration*. In: K Kourtit et al (eds.) *The Economic Geography of Cross-Border Migration*, Footprints of Regional Science, Springer.
- Federal Institute for Population Research (2022) *Geflüchtete aus der Ukraine in Deutschland: Flucht, Ankunft und Leben*. Dezember 2022.
- EUAA, IOM, OECD (2022) *Forced displacement from and within Ukraine: Profiles, experiences, and aspirations of affected populations*. Joint EUAA, IOM and OECD report, October 2022.
- Skeldon R (2013) *Global Migration: Demographic Aspects and its Relevance for Development*. Technical Paper No. 2013/6. United Nations, Department of Economic and Social Affairs, Population Division.
- Slobodian O and Fitisova A (2018). *Registering Domiciles in Ukraine: How the System Affects Ukrainians. A Sociological Survey*. CEDOS – Think Tank: Kiev.
- Sobotka T (2011) *Fertility in Central and Eastern Europe after 1989: Collapse and Gradual Recovery*. *Historical Social Research*, 36 (2).
- Sohst R, Tjaden J, de Valk H and Melde S (2020) *The Future of Migration to Europe: A Systematic Review of the Literature on Migration Scenarios and Forecasts*. International Organization for Migration, Geneva, and the Netherlands Interdisciplinary Demographic Institute, the Hague.
- State Statistics Service of Ukraine (2018) *Population of External Labour Migrants*. Statistical Bulletin. URL: http://csv2.ukrstat.gov.ua/druk/publicat/kat_u/2017/bl/12/bl_ztm_2017.zip
- Ukrainian Center for Social Reforms and State Statistics Service of Ukraine (2009) *Ukrainian External Labour Migration*. URL: http://csv2.ukrstat.gov.ua/druk/katalog/pracia/migr_engl.rar
- UNHCR (2005) *The Balkans: After the war was over*. *Refugees* 3(140). United Nations High Commissioner for Refugees.
- UNHCR (2022) *Ukraine Refugee Situation*. Operational Data Portal. <https://data.unhcr.org/en/situations/ukraine>.
- UNHCR (2022) *UNHCR and partners call for urgent support for refugees from Ukraine and their hosts*. *UNHCR, Briefing Notes*, 26.04.2022. URL: <https://www.unhcr.org/news/briefing/2022/4/6267ac074/unhcr-partners-call-urgent-support-refugees-ukraine-hosts.html>

UNHCR (2022) Minister of Social Policy of Ukraine and UNHCR Ukraine Representative sign agreement to expand displaced persons' access to social protection including cash assistance. *Press release*, 19.04.2022, UNCHR Ukraine.

UNHCR (2022) *Lives on hold: Profiles and intentions of refugees from Ukraine*. UNHCR Regional Bureau for Europe, July 2022.

United Nations, Department of Economic and Social Affairs, Population Division (2022) *World Population Prospects, 2022 Revision*. United Nations: New York.

United Nations, Department of Economic and Social Affairs, Population Division (2020). *International Migrant Stock 2020*. United Nations: New York.

United Nations, Department of Economic and Social Affairs, Population Division (2019) *World Marriage Data 2019*. United Nations: New York, (POP/DB/Marr/Rev2019).

Vakhitova H and Fihel A (2020) International Migration from Ukraine: Will Trends Increase or Go into Reverse? *Central and Eastern European Migration Review*, 9(2).

World Bank (2022) *Ukraine Rapid Damage and Needs Assessment (English)*. August 2022, the World Bank, Government of Ukraine, European Commission. Washington, D.C.: World Bank Group.

List of figures

Figure 1 Size of the population of Ukraine, January 1970 to January 20225

Figure 2 Countries or areas with the largest relative decline in population size between January 1991 and January 2022 (Only countries or areas with a population greater than 1 million in 2022 included).....6

Figure 3 Age-sex composition of the Ukrainian Population in 1991 and 2021 10

Figure 4 Refugees from Ukraine: Border crossings, registered refugees across Europe, and refugees registered for temporary protection or similar schemes in Europe..... 13

Figure 5 Comparison of the age composition of emigration, 2015-2020, with age composition of refugees after the Russian invasion..... 14

Figure 6 Impact of international displacement on Ukraine’s population: Pre-war age-sex structure of the population (Estimate for 1 January 2022) and the impact of international displacement per age and sex group..... 15

Figure 7 Parameters of migration scenarios: length of the war and type of migratory movement..... 20

Figure 8 Estimates of refugee population movement used in scenarios: Number of refugees and post-war number of returnees, refugees staying abroad and of family reunification of Ukrainian men joining their partners abroad..... 21

Figure 9 Return rates for regular migration considered in the four scenarios. 22

Figure 10 Scenarios of the population size of Ukraine depending on international displacement, return migration, and longer-term migration trends, 2020 to 2050. 23

Figure 11 Comparison of the age and sex composition of Ukraine’s population before the Russian invasion in 2022 and in 2052 by migration scenario..... 24

Figure 12 Relative change in broad age groups between 2022 (before the Russian invasion) and 2052, by migration scenario..... 25

Figure 13 Dependency ratios 2022 to 2052 by migration scenario 26

List of tables

Table 1 Population change from January 2022 to 2052 by scenario 24

Appendix

Population projection method

The Multidimensional population projection method is used to project the population by age and sex for each five-year period beginning in 2022. We used different assumptions for migration and distinguished between regular migrant population and refugee population due to Russian military aggression against Ukraine in our model. Each component of the population (fertility, mortality, migration, and refugees) was projected separately at first.

We calculated the average age-specific fertility rates (ASFR) for each five years period from the annually projected ASFR. To project the number of deaths, we relied on data from UN World population prospect 2022. The survival rate was used to calculate the population that will survive at the end of each five-year projection period. We also aggregated from the UN's yearly data by the UN survival data and took the average survival rate for each five-year period. (2022-2027, 2027-2032... 2047-2052). We used ASFR and survival ratio to calculate births and survived population between t and $t+n$. Finally, we projected the population of Ukraine up to 2052 using the following projection model.

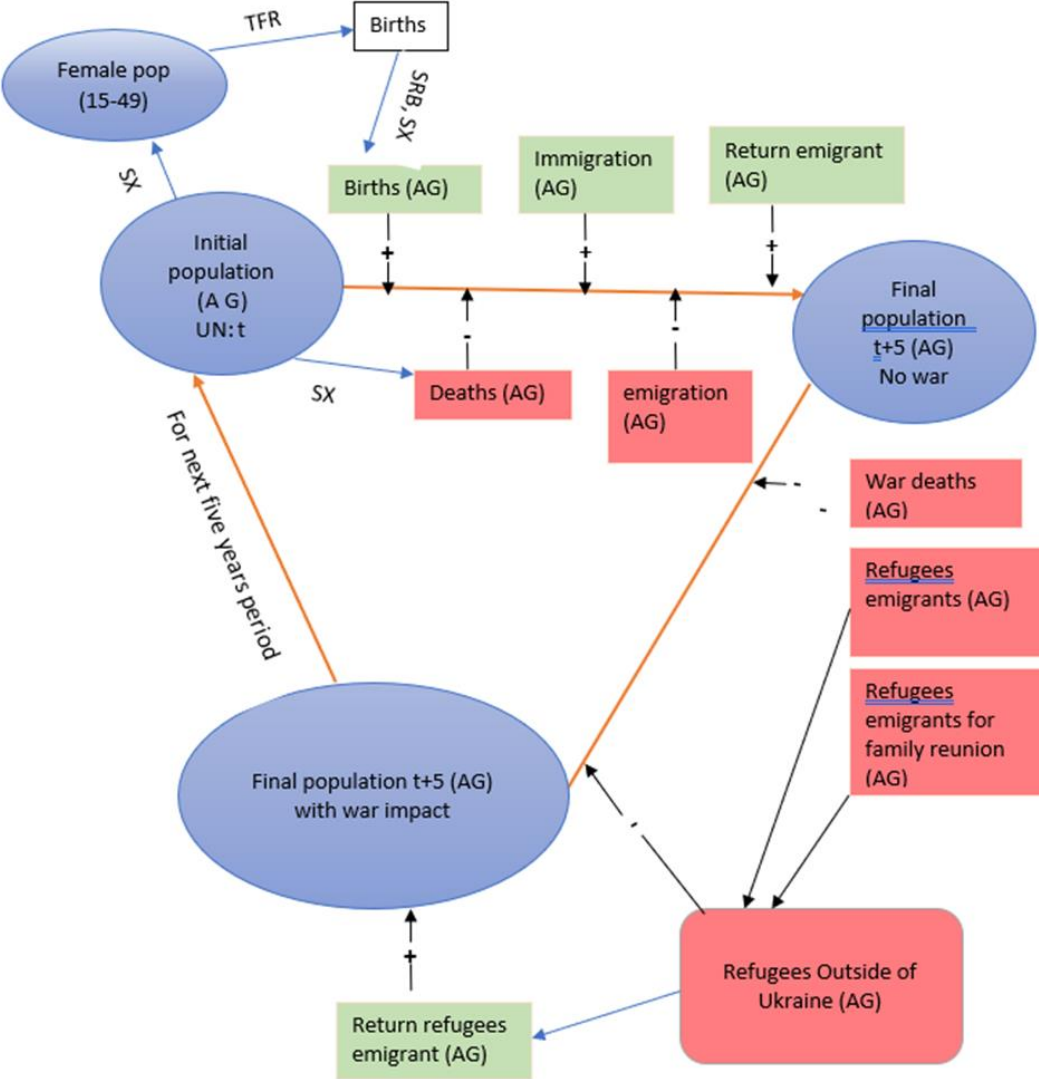
$$P(t+n) = P(t) + B(t) - D(t) + I(t) - E(t) + RI(t) - RE(t)$$

$t = 2022, 2027, \dots, 2047, 2052; n = 5$

- $P(t)$ is the population at time t
- $B(t)$ and $D(t)$ are number of births and deaths occurring between t and $t+n$.
- $I(t)$ and $E(t)$ are the number of immigrants and of emigrants from the country during the period t to $t+n$.
- $RI(t)$ and $RE(t)$ are the number of refugees immigrants and refugees emigrants from the country during the period t to $t+n$.

We also projected the total number of refugees by age and sex from Ukraine in other destination countries using Ukraine's fertility and mortality rates.

Figure 14 Modelling approach - Flow chart



GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en.

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

Open data from the EU

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

The European Commission's science and knowledge service

Joint Research Centre

JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.



EU Science Hub
joint-research-centre.ec.europa.eu

 @EU_ScienceHub

 EU Science Hub - Joint Research Centre

 EU Science, Research and Innovation

 EU Science Hub

 EU Science



Publications Office
of the European Union