

# The war, refugees, and the future of Ukraine's population

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## Abstract

This study analyses the effect of Russia's invasion of Ukraine in 2022 on the future of Ukraine's population. We conduct a series of population projections with different assumptions on the proportion of refugees that may return to Ukraine. Our projections show that if past demographic trends continue, Ukraine's population is projected to decline by one-sixth over the next two decades and become older. These trends are largely driven by past and current demographic developments: continued very low fertility and large-scale emigration at the turn of the century. With war casualties and a large portion of the Ukrainian population seeking safety abroad from the conflict, the country's population is projected to decline by one-third. The decline would be even larger among the working-age population and children. Russia's invasion has not only led to immense human and economic costs in Ukraine in the present but also carries long-term demographic repercussions.

## KEYWORDS

demography, refugees, Ukraine, war

## 1 | CONTEXT

Since Russia's invasion of Ukraine in February 2022, questions have been raised regarding how the war will impact Ukraine's population. Armed conflicts and wars bring demographic implications through the disruption of mortality and fertility patterns in the afflicted country, but population change due to mass refugee migration and potential return migration is central to the demographic prospects of a country. The number of deaths and refugees depends on the magnitude of the conflict, that is, whether the conflict involves mostly armed forces or also the wider civil population. However, focusing on the impact of the war on the total population only tells us part of the story. Certain population groups are more exposed to the consequences of the war than others. For example, most deaths occur among young men, that is, those in their 20s who form the majority of soldiers.

Refugees are also often young people with families. In the case of Ukraine, currently, they mostly consist of young women with children (Kohlenberger et al., 2022).

The aim of this study is to analyse the possible effects of the current war in Ukraine on the country's population size and structure in the short- and medium-term focusing on migration flows. To do so, we conduct a series of population projections. We assess the impact of Russia's invasion using different assumptions on the proportion of refugees that may return to Ukraine. The structure of the study is as follows. First, we review previous research on the demographic impact of armed conflict. Next, we provide a short overview of Ukraine's demography. We then discuss the projection scenarios and conduct medium-term population projections. This is followed by the presentation and discussion of the results and their implications for the future of Ukraine's population.

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## 2 | WAR AND DEMOGRAPHY

The population structure of a nation is vulnerable to external shocks such as famines, diseases, and wars. The shock of war, in particular, leads to both short- and long-term repercussions in mental and physical health (Bogic et al., 2015; Summerfield, 2000), mortality (Guha-Sapir et al., 2018), fertility (Abu-Musa et al., 2008; Bolouki & Zal, 2020; Castro Torres & Urdinola, 2019; Lindstrom & Berhanu, 1999), and out-migration (Iglicka, 2019) of the affected population. The demographic processes of births, deaths, and migration are highly interlinked. The impact of war, although felt by individuals across all age groups and gender, has the potential to warp population structure due to the differential mortality risks and migration among different population subgroups.

Mortality and fertility are heavily intertwined. In wartime, deaths can be classified as deaths in combat, one-sided violence, criminal and unorganised violence, and non-violent mortality (Brunborg & Tabeau, 2005). The burden of deaths in combat, historically, has been borne by men of conscription age, leading to the loss of potential reproductive mates for women. In theory, other types of deaths should be less sex discriminating, but in practice, the population at risk largely depends on the nature of the war. Evidence from the Syrian civil war has shown heightened death rates among women and children due to the deliberate targeting of the civilian population through aerial bombing and shelling in urban areas (Guha-Sapir et al., 2018). Massive losses of life among women and children in combination with severe physical injury and psychological trauma are likely to reduce fertility at the population level with lasting effects (Abu-Musa et al., 2008; Bolouki & Zal, 2020). Those who survive the early days of war may choose to move internally to areas not yet plagued by violence, or elect to seek asylum abroad, leading to an exodus en masse.

Refugee migration differs vastly from economic migration in terms of what is at stake, but they share the similarity that the risks associated with the move are often managed and negotiated on a household level. Household members' vulnerabilities, expectations, and responsibilities differ by age and sex. Migration decisions in family contexts are often conceived under the hope that the right calculations will lead to a higher chance of the survival of the maximum number of its members, and an elevated probability that the family might reunite in the future (FitzGerald & Arar, 2018). In the case of Ukraine, the dire need for defence resulted in its president calling for general military mobilisation, prohibiting men aged 18–60 from leaving the country (Qiblawi & Alvarado, 2022), which skewed the demographic characteristics of those who left Ukraine mainly towards women and children.

Among those who exit the country, individuals may settle permanently abroad or return shortly after the war (Dustmann et al., 2017; Zakirova & Buzurukov, 2021). Evidence from the Bosnian war (1992–1995) shows that more than a million people left Bosnia and Herzegovina as refugees. About 40% of Bosnian refugees returned in the second half of the 1990s and early 2000s (Valenta & Strabac, 2013). The share of returning refugees varied significantly

across countries showing the effect of proximity, policies for economic integration, and incentives for return migration. The share of returnees was highest among those who had fled to Germany (three-quarters returned) and lowest for those in Sweden (less than 5%). German authorities denied refugees access to the labour market and education; furthermore, they required the departure of Bosnian refugees from Germany when the war ended. In contrast, Sweden granted permanent settlement permits at an early stage to refugees from Bosnia and Herzegovina. The policies of other European countries were in-between: in the beginning, most countries expected to send refugees back to Bosnia after the war; however, many countries later changed their approach and provided refugees with access to education, and labour markets and offered them permanent settlement and integration support (Valenta & Strabac, 2013).

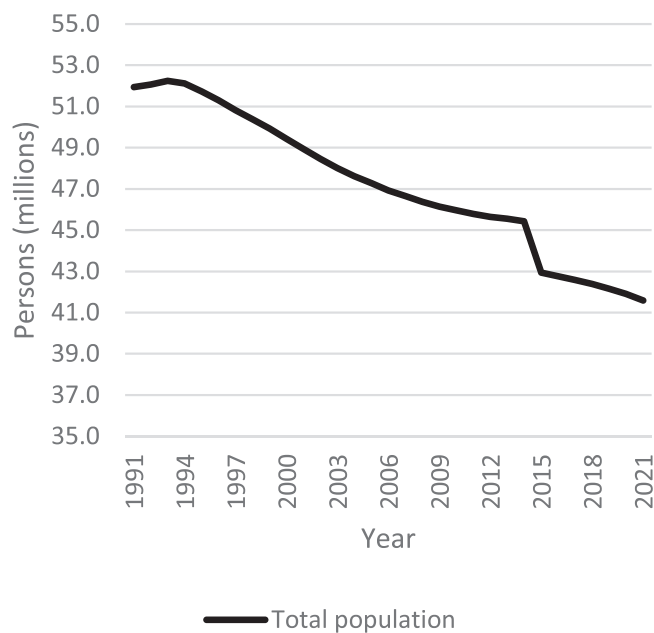
Economic theory alone is therefore inadequate for addressing the return migration of refugees, due to its assumptions of freedom of choice and perfect information which are largely inapplicable to involuntary migrants (Klinthäll, 2007). Receiving countries' policies of incorporation, settlement, and integration play an important role as the case of Bosnian refugees demonstrates. Unsurprisingly, structural and political conditions in the origin country also influence refugees' return intention. Peace and security are not guaranteed after the initial conflict ends, and neither is respect for human rights nor political freedom (Zakirova & Buzurukov, 2021). Individuals are less likely to return if the erosion of democracy post-conflict is keenly felt. Moreover, even if economic factors do not loom quite as large compared to political factors, socioeconomic reintegration concerns remain significant in the return decision-making process (Klinthäll, 2007; Zimmermann, 2012). The viability of a livelihood often depends on factors such as the speed at which infrastructures are rebuilt and the pace of economic recovery of the affected regions. Although highly developed countries may rise 'like a phoenix' from war ashes, the least developed countries are likely to remain in a poverty trap for prolonged spells in the absence of foreign aid (Kugler et al., 2013), rendering return migration of displaced individuals less likely.

Refugees' decisions to return are influenced by both their ties to the receiving and the sending country (Carling & Pettersen, 2014). Push factors in the receiving country alone do not reliably predict migrants' (including refugees) return if the pull factors in the sending country prove insufficient (Alrababa'h et al., 2020). Refugees who are more educated have stronger return intentions, presumably due to their better prospects for successful reintegration. Those who fled to a nearby state are more likely to return than those who have migrated further (Al Husein & Wagner, 2023; Rendall & Ball, 2004). Similar to emigration, the presence of children in the household increases the costs and hence, decreases the probability of (return) migration (Klinthäll, 2007). In the context of Ukraine, a lower-middle-income country (United Nations, 2020), refugees might face difficulties to return as the country faces a long road to full social and economic recovery post its invasion. With almost 8 million individuals now seeking asylum abroad (as of January 2023), Ukraine faces substantial demographic challenges for years to come.

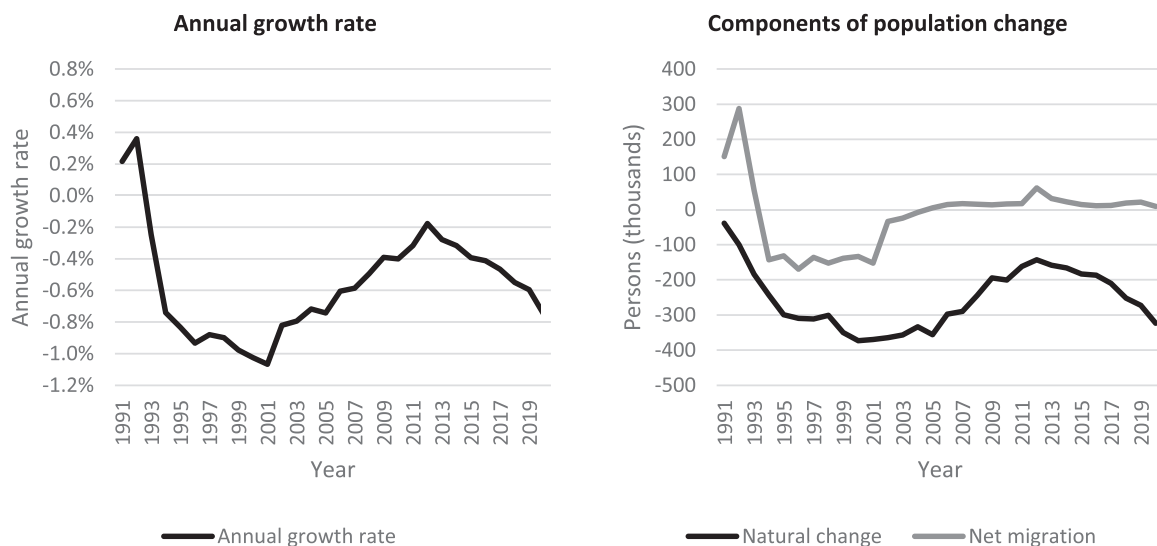
### 3 | SHORT HISTORY OF UKRAINE'S DEMOGRAPHY

#### 3.1 | Population change

Ukraine gained independence from the Soviet Union in 1991. Since then, its population has been continuously declining. In 1991, there were almost 52 million people in Ukraine but by 2021, the total population has decreased to 41.6 million (Figure 1). The decline has been gradual except for a sharp decrease in population size between 2014 and 2015 from 45.4 million to 42.9 million. This rapid



**FIGURE 1** Ukraine's population, 1991–2021. Source: State Statistics Service of Ukraine (2022).



**FIGURE 2** Annual population growth and the components of population change in Ukraine, 1991–2020. Source: See Figure 1.

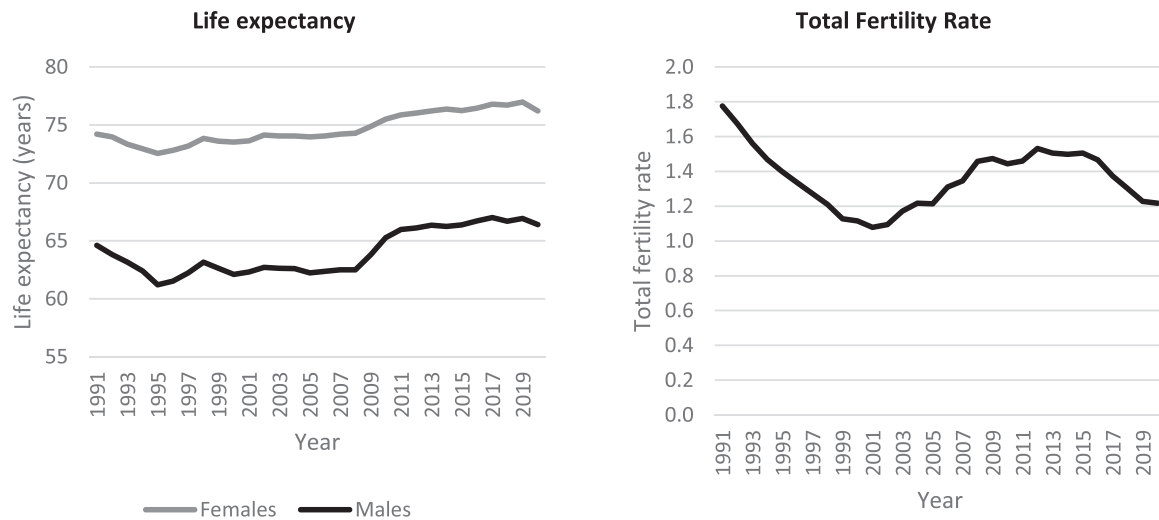
population decline was related to the annexation of Crimea by Russia (a population of 2.3 million in 2014) and the War in Donbas (around 200,000 refugees and 10,000 deaths). Overall, the size of the Ukrainian population has declined by 20% since 1991.

In line with the continuous population decline, there has been negative population growth since 1993 (Figure 2). The most rapid population decline occurred in the 1990s; before gradually slowing between 2000 and 2012. However, since 2012, the annual rate of population decline has again started to accelerate. Natural population change has been the main driver of the decline in population size. In other words, the death rate has been higher than the birth rate, leading to negative annual population growth and overall population decline (Perelli-Harris, 2008). Although in the late 1990s and early 2000s emigration also contributed to the population decline, since 2005 Ukraine has experienced marginally positive net migration (i.e., more immigrants than emigrants). Nonetheless, this positive net migration did not compensate for the population loss due to low or very low fertility levels.

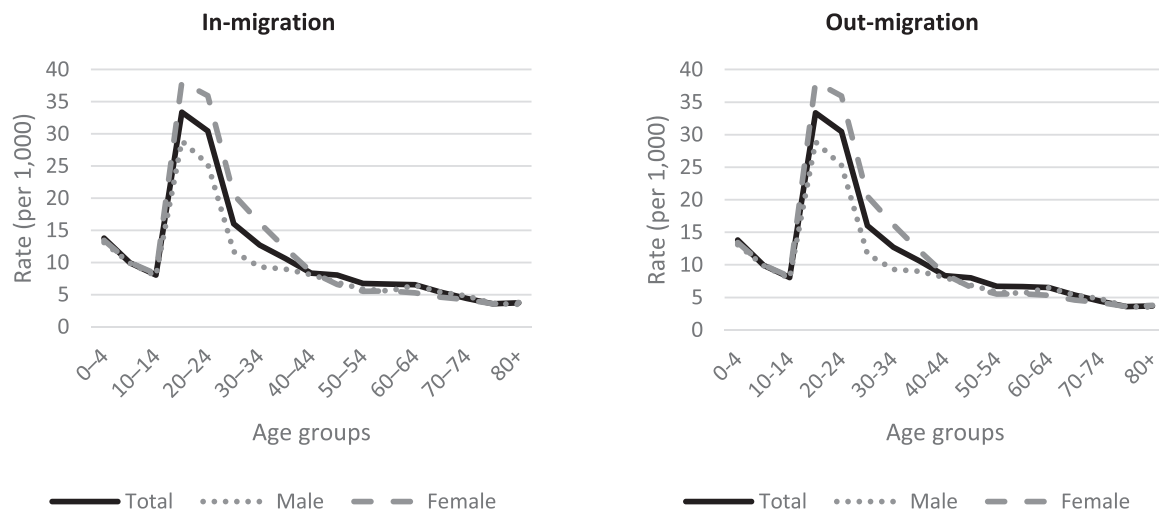
#### 3.2 | Mortality and fertility

Overall, mortality slightly declined and life expectancy at birth increased somewhat between 1991 and 2020 in Ukraine (Figure 3). Life expectancy at birth in 1991 was 69.6 years, whereas this figure was 71.4 in 2020. Men's life expectancy is almost 10 years lower than women's. The magnitude of this gender gap persisted over time. Around 15% of this gap is attributed to alcohol-related causes (Trias-Llimós & Janssen, 2018), 32% to smoking, and 13% to biological factors (Luy & Wegner-Siegmundt, 2015).

Dramatic changes have taken place in fertility levels since the country gained independence in 1991. The total fertility rate (TFR) declined from 1.8 in 1991 to 1.2 in 2020. The TFR was the lowest in 2000 at just 1.1. Between 2001 and 2011, the TFR increased to 1.5.



**FIGURE 3** Life expectancy at birth and total fertility rate in Ukraine, 1991–2020. Source: See Figure 1.



**FIGURE 4** In- and out-migration rate in Ukraine by age (5-year groups) and sex, average rates for 2016–2020. Source: See Figure 1.

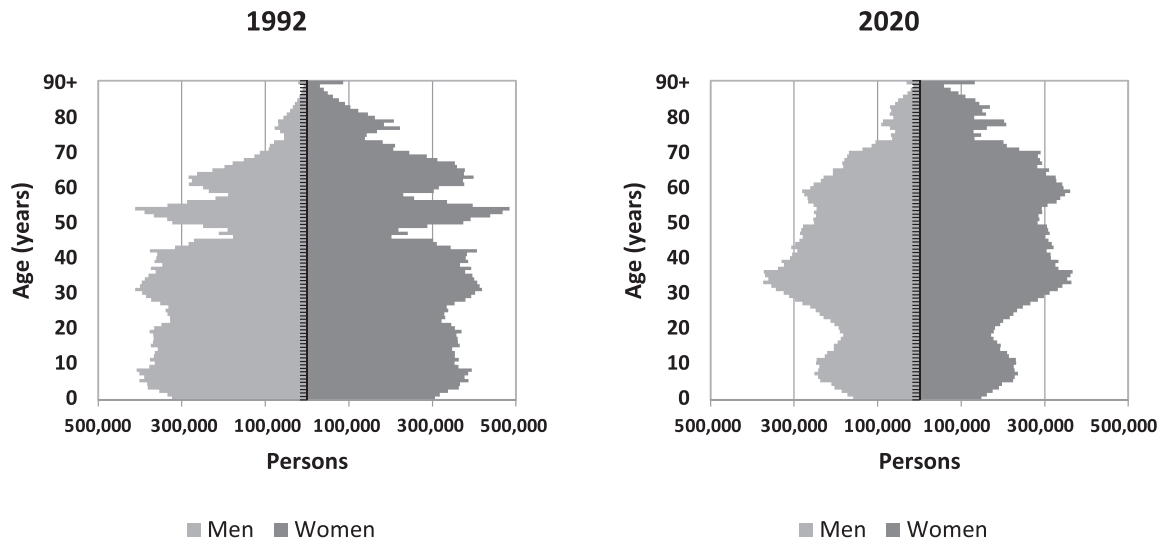
Following a few years of stability, it declined again to 1.2. The increase in the TFR starting in 2001/2002 was possibly linked to increases in the birth allowance along with some improvement in the socioeconomic situation and the recuperation of births that were delayed in the 1990s (Frejka & Gietel-Basten, 2016).

### 3.3 | International migration

Figure 2 showed that Ukraine's net migration has been positive since the early 2000s. The age profiles of in- and out-migrants (Figure 4) are remarkably similar. Younger individuals (aged 15–35) are most likely to both immigrate to and emigrate from Ukraine and young children are also likely to both leave and arrive together with their parents. Between ages 20 and 44, women have higher in- and out-migration rates than men.

### 3.4 | Population composition

As a result of these population processes, the structure of Ukraine's population also changed between the early 1990s and 2020 (Figure 5). In 1992, those born in the 1930s formed the largest cohort, and the population structure was young with large groups of individuals aged 5–45. However, by then a decline was already visible in the number of children in the 0–4 age group. In 2020, the population structure by age and sex looks remarkably different. The pyramid shows an ageing population and a gender imbalance. The group of 0- to 20-year-olds is relatively small, and women outnumber men in middle and older ages. Overall, past population trends in Ukraine, especially significant emigration in the second half of the 1990s and early 2000s and low fertility since the mid-1990s, have led to an ageing and declining population, making it vulnerable to any external shock.



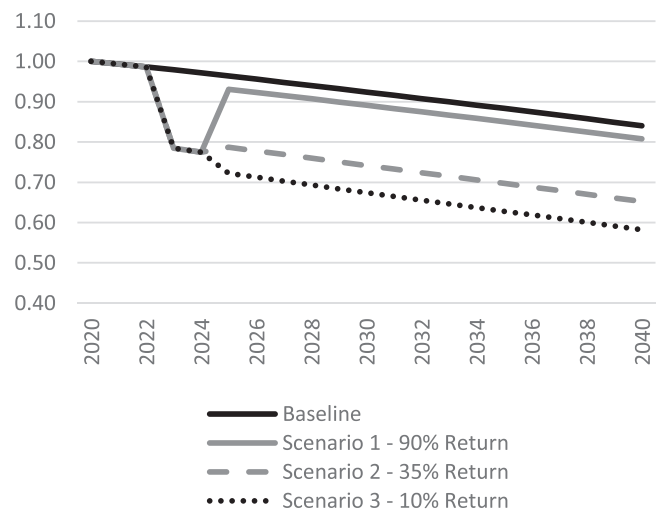
**FIGURE 5** Ukraine's population by age and sex in 1992 and 2020. Source: See Figure 1.

#### 4 | PROJECTION METHODS AND ASSUMPTIONS

To estimate the effect of the war on population change, we conduct population projections using the cohort component method with the POPGROUP projection software (Edge Analytics, 2020; Vollset et al., 2020). We adopt the deterministic approach but conduct a series of projections with different assumptions on the proportion of refugees that may return to Ukraine. Our aim is not to predict the future, but to project changes in population size and structure conditional on different assumptions about the number of refugees returning to Ukraine following the war. This allows us to measure the effect of the war, and in particular the movement of refugees, on Ukraine's population.

We use the information on Ukraine's population by age and sex in 2020 derived from the latest population statistics recorded by the Ukrainian government. Our baseline projection assumes that fertility and mortality rates will stay at their pre-war levels for the next two decades. If fertility rates continue to decline per observed trends, our baseline scenario should be interpreted with allowance for over-estimation. To remove any annual variation, we calculate average rates over a 5-year period (2016–2020). By continuing past trends in fertility and mortality throughout the projection, the analysis aims to focus mostly on the effect that different proportions of refugee returns will have on the future population, all other factors aside. We also assume that overseas migration flows will remain the same as they have been on average in the past 5 years. However, they differ in 2022 and 2023: we assume that only refugees leave Ukraine in 2022 and that they may return in 2024.<sup>1</sup>

<sup>1</sup>While we cannot know whether the conflict will end in 2024, we have found that projections will result in the same 2040 population size and structure regardless of when refugees return.



**FIGURE 6** Projected relative population change in Ukraine, 2020–2040.

We develop four projection variants including the baseline. These variants are based on the current statistics (January 2023) on casualties and refugees: (i) 10,000 deaths among the Ukrainian army (Reuters, 2022; The Brussels Times, 2022); (ii) 6,952 civilian deaths<sup>2</sup> (UNHCR, 2023a) and 8 million refugees (UNHCR, 2023b). As the information on the age distribution of casualties is not available, we assume that all deaths among soldiers have occurred among men in ages 20–29 and that civilian casualties are uniformly spread over all age groups (proportionally to their relative size in the total population). Using data from a study that surveyed a sample of Ukrainian refugees in Poland and Austria

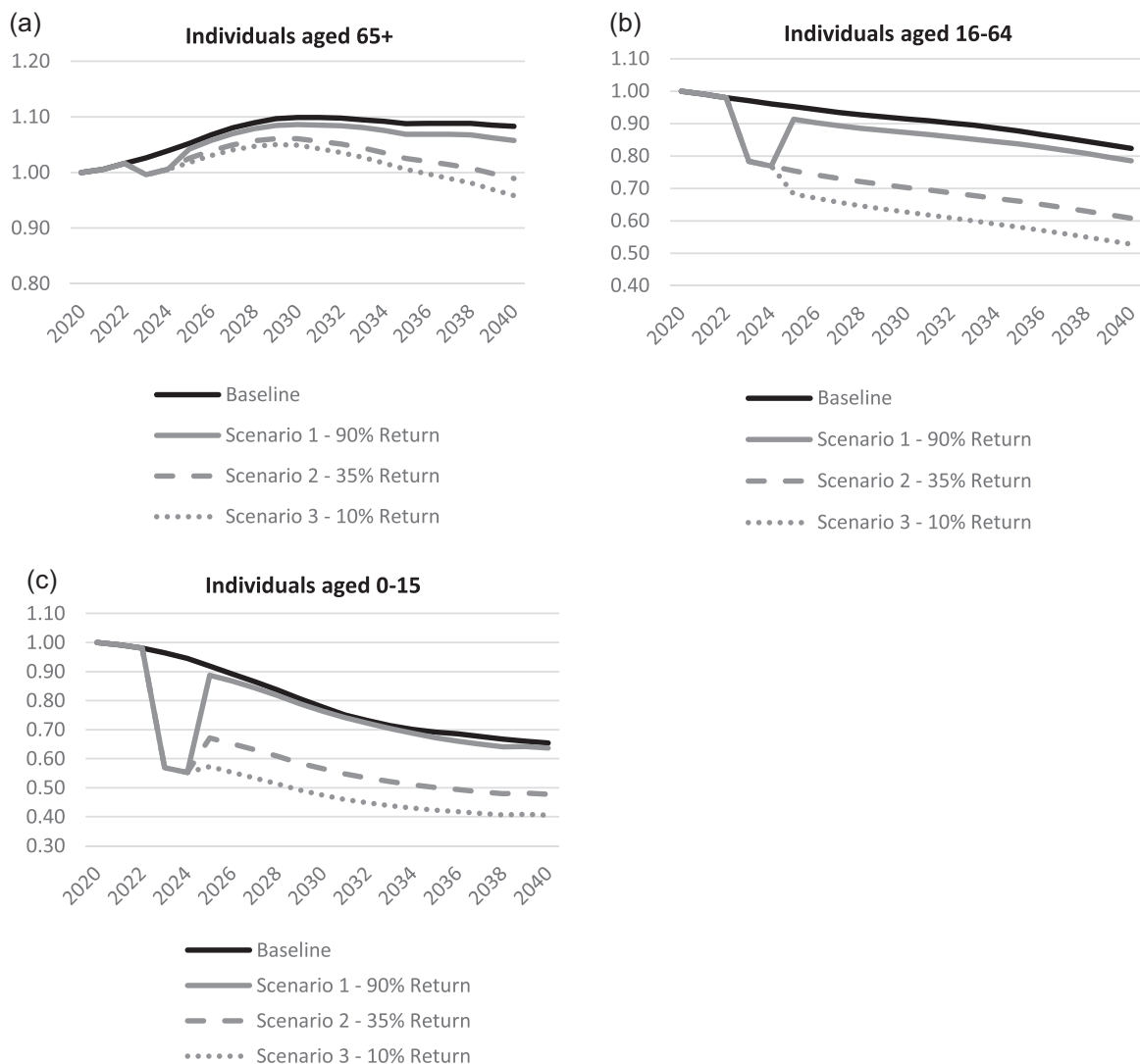
<sup>2</sup>We have chosen to use UN data as a source for the number of civilian casualties; however, these data come with the caveat that these figures are an underestimate of the true number of deaths. Projections run using high casualty scenarios (20,000 civilian deaths) resulted in little difference in the population size/structure by 2040.

(Kohlenberger et al., 2022), we have calculated the weighted average of the age and sex structure to use as the base for our refugee population. This refugee population consisted of a higher proportion of children compared to pre-war patterns of outward migration observed in Ukraine, and an older age profile for adult women, with fewer women in their late teens to mid-20s and a higher proportion of women aged between 30 and 49 leaving the country (see Appendix A).

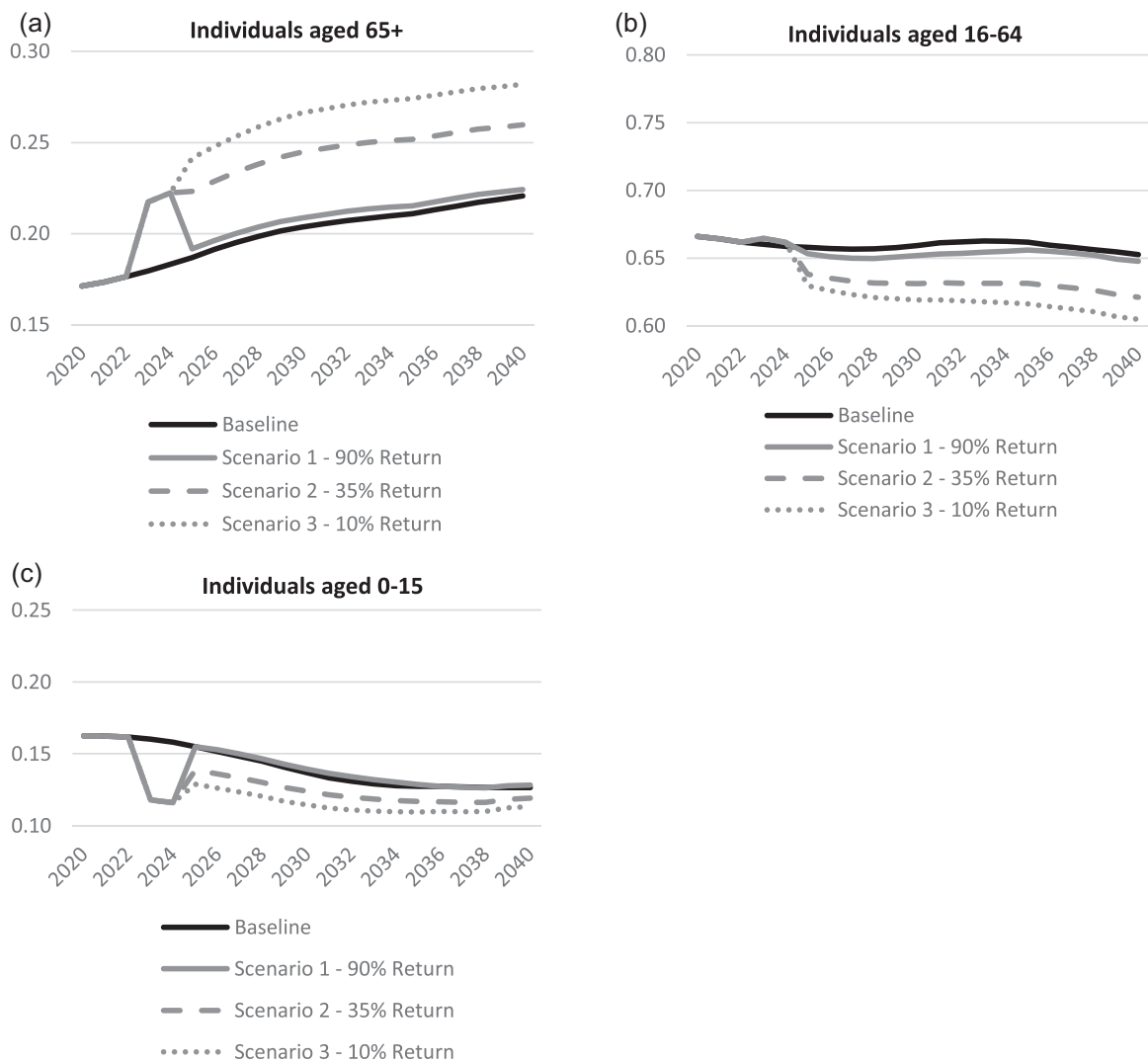
While it is unclear what will happen to refugees, that is, whether they will return to Ukraine or not, we developed three scenarios based on recent data concerning refugees' return intentions. There is evidence to suggest that 35% want to return after the war has ended, while around 8% state that they have no plans to return (Population Europe, 2022). Data from the UN also suggests that 13% of refugees plan to return to Ukraine compared to 76% who state they plan to stay in their host country or move to a third country in the near future, while 13% are unsure of their future plans (UNHCR, 2022). It is based upon these previous findings that we constructed our three projection scenarios: (i) 90% of refugees will return during 2024;

(ii) 35% of refugees will return during 2024; and (iii) 10% of refugees will return in 2024. The first assumption could be true, if, for example, Ukraine remains an independent democratic country, whereas the final could occur if, for example, most of the country becomes occupied by Russia and potentially annexed, a condition which many refugees may not find acceptable. Besides intentions expressed by Ukrainian refugees, the experience of Bosnian refugees from the 1990s and 2000s also supports our second assumption: about 40% of Bosnian refugees returned to Bosnia and Herzegovina (the figure was 27% if we exclude refugees from Germany who were forced to leave the country after the war ended, see Valenta & Strabac, 2013). To summarise, our scenarios are as follows:

0. Baseline: Pre-war trends in fertility, mortality, and migration continue.
1. 8 million refugees, 90% return.
2. 8 million refugees, 35% return.
3. 8 million refugees, 10% return.



**FIGURE 7** Projected relative change of individuals in different age groups in Ukraine, 2020–2040.



**FIGURE 8** Projected share of individuals in different age groups in Ukraine, 2020–2040.

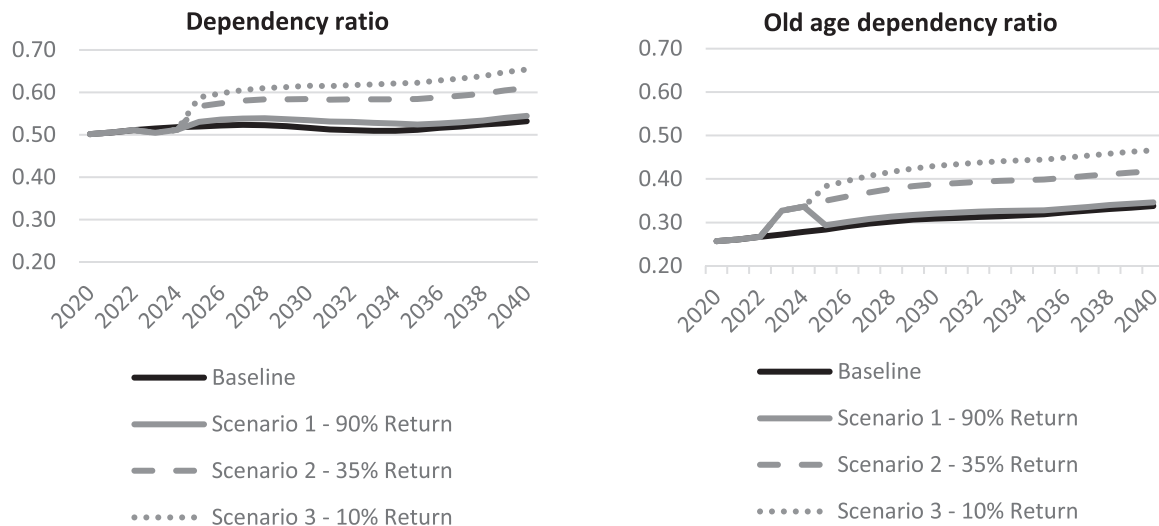
For Scenarios 1–3 we also assume that many young men currently in Ukraine who survive the conflict will join their (refugee) families abroad later so that families will stay together. This means that the total number of refugees will significantly increase. For example, if 10% of refugees stay abroad, a proportion of women will be joined by a man of the same age group. The number of men joining their refugee families abroad was adjusted to take into account the proportion of refugee women who would be partnered. To do so, we used information on the cumulative percentage of women ever married by 5-year age groups for women aged 20–59<sup>3</sup> (see Appendix B). The number of men assumed to die during the conflict, both civilian and military, were also removed from the pool of men

who could potentially reunite with family. It is assumed that these men will leave to reunite with their families in 2024 as refugees who wish to return begin to do so.

## 5 | PROJECTION RESULTS

Our baseline projection shows that if the current demographic trends (or the average of the trends over the past five years) continue, Ukraine's population will decline by 16% in the next two decades from 41.7 million in 2020 to 35.1 million in 2040 (Figure 6). This would be a significant decline driven by population processes in the past: large-scale emigration of young adults in the late 1990s and early 2000s and continuously low fertility levels since the 1990s. All variants considering the impact of the war project an even larger decline in Ukraine's population. With most refugees returning to the country, Ukraine's population is projected to decline by 19% (Scenario 1) to 33.7 million. Should 35% of refugees return, the

<sup>3</sup>As we did not have data on the proportion of women married by age in Ukraine, the cumulative percentage of married women was taken from data for Romania (Andersson et al., 2017) which appears to most closely reflect marriage patterns in Ukraine when cross-referenced with other data sources (Butkevych, 2012; Perelli-Harris, 2008; Romaniuk & Gladun, 2015)



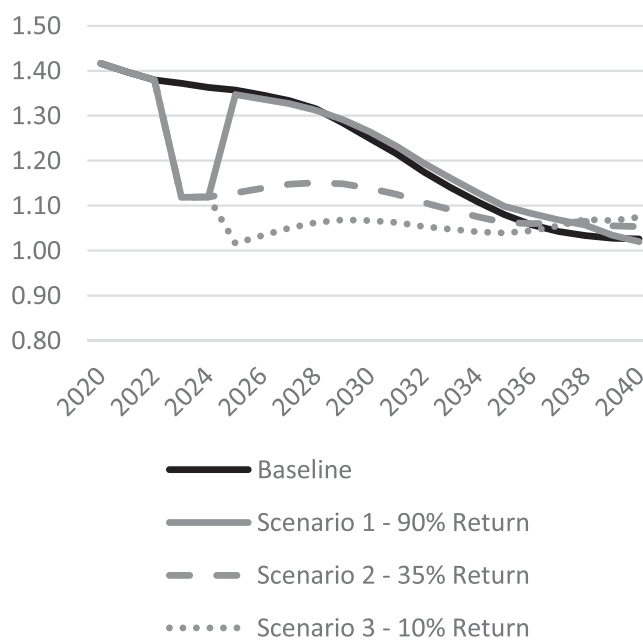
**FIGURE 9** Projected dependency ratio and old age dependency ratio in Ukraine, 2020–2040.

population is projected to decline by 35% to 27.2 million; while if only 10% of refugees were able or willing to return, Ukraine's population is projected to decline by 41% to 24.3 million. Clearly, the future size of Ukraine's population will depend very much on the number of current refugees and on whether they can return to their homeland or not (assuming no large-scale civil casualties).

The differences in the projected changes across age groups are striking. Should current population trends continue, the number of people aged 65 and older would slightly increase over the next two decades (Figure 7). In contrast, the number of working age population (16–64) and children (0–15) would decline by 18% and 35%, respectively. All scenarios considering the effect of the war show a further decline in the size of the working-age population and that of children. Depending on the number of refugees returning to Ukraine, the decline of the country's working-age population is projected to be 21% (Scenario 1), 39% (Scenario 2), and 47% (Scenario 3) and that of children 36%, 52%, and 59%, respectively.

Projected changes in the relative size of different age groups provide further information on the future of Ukraine's population. With current trends continuing, the share of people aged 65 and older is projected to increase from 17% in 2020 to 22% in 2040 (Figure 8). In contrast, the share of the working-age population will decline from 67% to 65% and that of children from 16% to 13%. Again, the war will lead to a further decline in the share of the working-age population and that of children. With a large Ukrainian refugee population staying abroad (Scenario 3), the share of the elderly is projected to increase to 28%. In contrast, the proportion of the working-age population will decline to 60% and that of children to 11%.

We have also calculated the dependency ratio and the old age dependency ratio. The former measures the ratio of individuals aged 0–15 and 65+ to that of 16- to 64-year-olds, whereas the latter is the ratio of individuals aged 65+ to that of 16- to 64-year-olds (Hinde, 1998). The dependency ratio is projected to change relatively little over the next two decades (Figure 9). This is largely because the

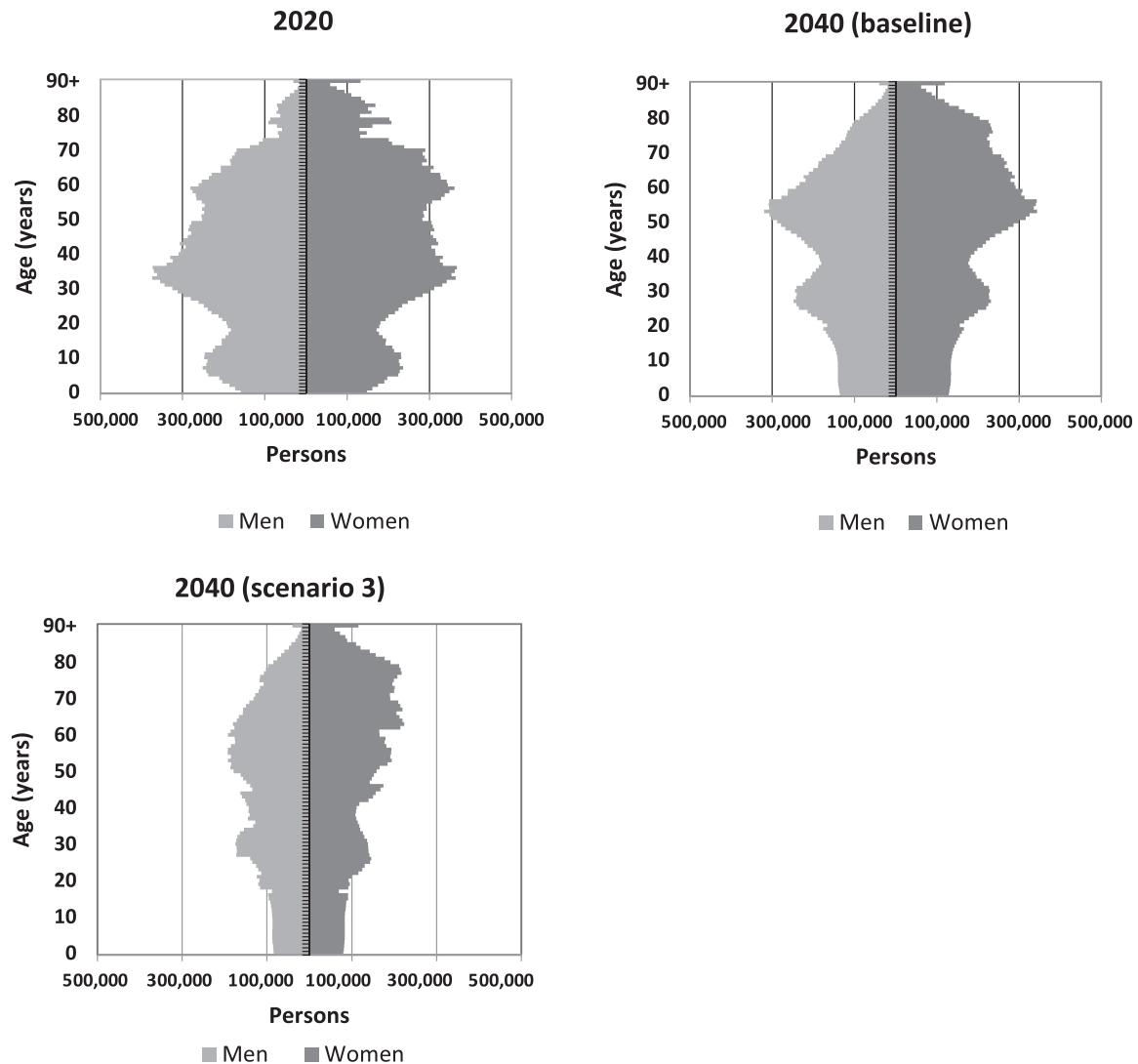


**FIGURE 10** Projected ratio of population aged 16–44 to aged 45–64, in Ukraine, 2020–2040.

increasing elderly population will be offset by the decreasing number of children. In contrast, the old age dependency ratio will increase from 26 to 34 indicating that Ukraine's population is expected to experience significant ageing. The working-age population is also projected to age. The analysis shows that the ratio of the younger working-age population (16–44) to the older working population (45–64) would decrease from 1.42 to 1.03 (Figure 10). With a large Ukrainian refugee population staying abroad (Scenario 3), the ratio would decline to 1.07.

Finally, the comparison of population pyramids illustrates and summarises the main changes in Ukraine's population. We see a





**FIGURE 11** Ukraine's population by age and sex in 2020 and 2040 (baseline and Scenario 3).

clearly declining and ageing population (Figure 11). Most importantly, the decline and shrinking of Ukraine's working-age population is evident should a large refugee population stay abroad.

## 6 | DISCUSSION

The aim of this study was to analyse the effect of Russia's invasion on the future of Ukraine's population. We conducted a series of population projections with different hypothetical scenarios on the proportion of refugees that may return to Ukraine post-conflict. Our study highlights the central roles emigration and return migration play in the long-term demographic consequences for the war-torn country, compared to studies that focus on the effects of changing fertility and mortality patterns due to violence (e.g., UN DESA, 2022). First, our analysis shows that if past demographic trends continue, Ukraine's population will decline by one-sixth in the next two decades. Second, with a large share of the refugee population staying

abroad, the decline is projected to be even larger, or by one-third. Finally, we project significant differences by age group. The number and especially the share of children in the population is projected to decline, whereas those of the older population will increase suggesting significant population ageing, which will be exacerbated if a smaller share of the refugee population returns to Ukraine. Although the share of the working-age population is projected to only slightly decline, it will become significantly older.

Our results also highlight the importance of the share of refugees returning to Ukraine for its population size and structure. If 90% of refugees return to Ukraine, population decline and ageing would be largely similar to that of our baseline projection (the counterfactual, or in the absence of the war) regardless of the size of the refugee population. However, if only 35% or 10% of refugees return to Ukraine (Scenarios 2 and 3), the population would decline by one-third and two-fifths by 2040, respectively. Even more striking is the decline in the size of the working-age population and especially the number of children by 2040. These findings highlight the importance

of rebuilding Ukraine following the war in such a way as to enable and attract refugees to return.

Our demographic accounting only considers the direct effects of past demographic trends and the war on the future of Ukraine's population. There are also indirect effects such as possible long-term health crises among the civil population due to injuries, infectious diseases (such as COVID-19), and psychological trauma (Jawad et al., 2020). Future migration streams are likely to depend on the country's political and economic developments. Return migration is difficult to predict (Dustmann & Weiss, 2007). Migrants may also move on to a third country through resettlement schemes (Garnier et al., 2018) or independently in search of family or better living conditions. Previous findings on refugees from Bosnia and Herzegovina suggest that the prospects of refugees' return heavily depend on both policies regarding reception and repatriation of destination countries (Valenta & Strabac, 2013). With long-term political and economic instability, refugees are not only unlikely to return, but young adults and families still in Ukraine may also decide to leave the country eventually. Fertility may stay depressed in the context of prolonged uncertainty. To conclude, our analysis shows that Ukraine's population has been declining and ageing and these processes are projected to continue in the next two decades. Russia's invasion of Ukraine has not only led to tremendous human and economic costs in Ukraine in the present but will also have long-term demographic repercussions.

## ACKNOWLEDGEMENTS

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in State Statistics Service of Ukraine at <https://ukrstat.org>. These data were derived from the following resources available in the public domain: State Statistics Service of Ukraine, <https://ukrstat.org>.

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APPENDIX A: REFUGEE POPULATION BY AGE AND SEX

See Figures A1 and A2.

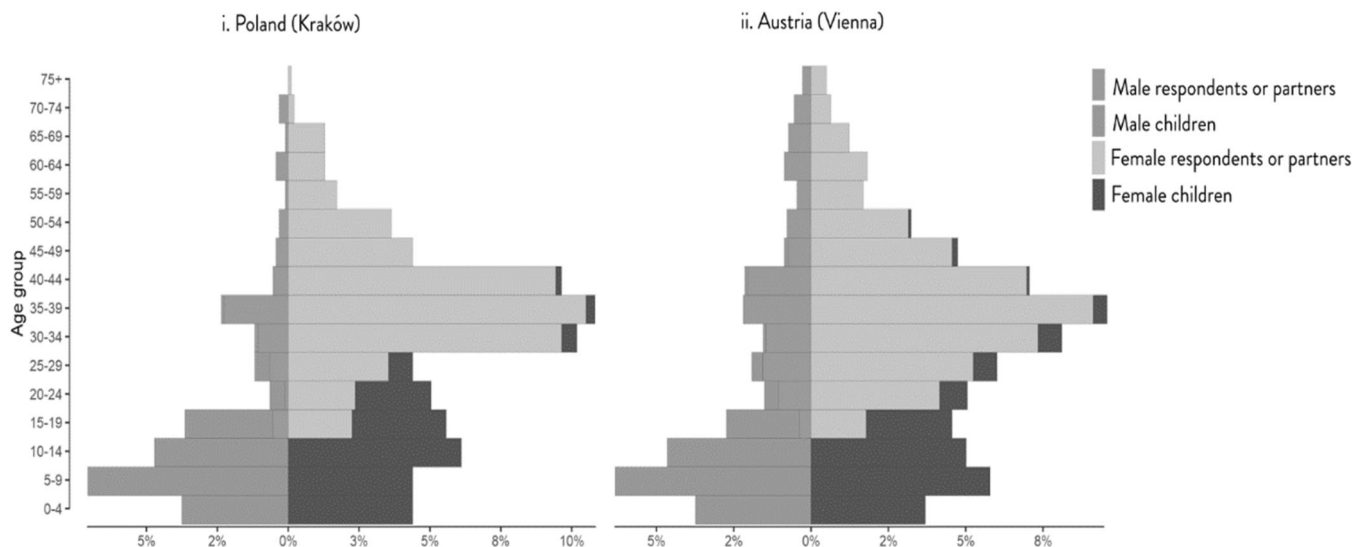


FIGURE A1 Age-sex distribution of Ukrainian refugees in Austria and Poland. Source: Kohlenberger et al. (2022).

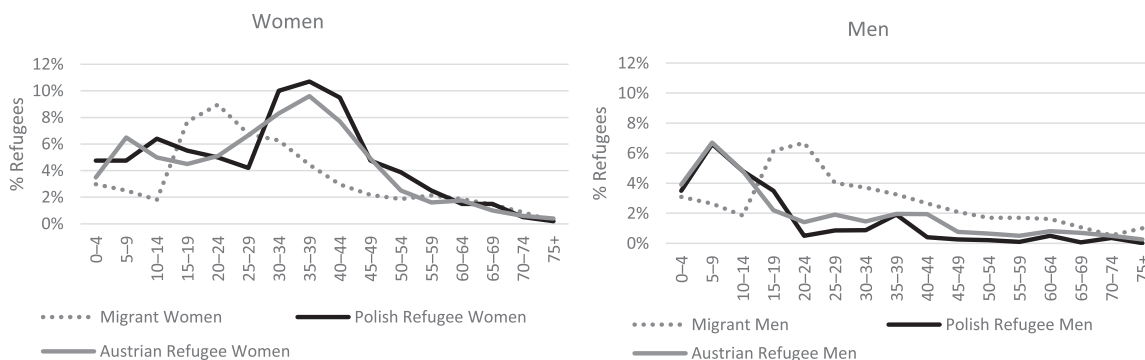


FIGURE A2 Comparison of refugee age structure to pre-war outward migration.

APPENDIX B: REUNITING MEN ADJUSTMENT

In the projection models, all 8 million refugees leave in the year 2022, with different proportions of these refugees (10%, 35%, and 90%) returning to Ukraine in 2024.

We also assume that once refugees return in 2024, a proportion of men aged 20–59 will leave Ukraine to reunite with their families who have remained in their host countries. This number of men was calculated to be proportional to the number of women aged 20–59

remaining abroad once other refugees have returned and adjusted to consider the number of women who would be married at each 5-year age group.

The number of men leaving to reunite with their families was calculated by taking the number of women aged 20–59 in 2021 and calculating the proportion which would be leaving as refugees in each scenario.

Tables B1 and B2.

**TABLE B1** Share of men reuniting with families abroad.

| Scenario   | Women aged 20–59 in 2021 | Refugee women aged 20–59 | Proportion | Men aged 20–59 in 2021 (minus refugee men) | Reuniting men population |
|------------|--------------------------|--------------------------|------------|--------------------------------------------|--------------------------|
| 10% Return | 11,790,684               | 3,618,072                | 0.3        | 10,936,134                                 | 3,355,846                |
| 35% Return | 11,790,684               | 2,613,052                | 0.22       | 11,044,286                                 | 2,447,635                |
| 90% Return | 11,790,684               | 402,008                  | 0.03       | 11,282,220                                 | 384,672                  |

Note: After calculating the pool of men at risk of leaving to reunite with family members abroad, the population was distributed across age groups based on the proportion of female refugees who would remain abroad using the refugee distribution outlined in Appendix A. This figure was then adjusted by the cumulative percentage who we would expect to be married at each age.

**TABLE B2** Marriage adjustment (for 10% return scenario).

|       | Reuniting Men | Excluding men assumed to have died | Marriage Adjustment | Adjusted number of men |
|-------|---------------|------------------------------------|---------------------|------------------------|
| 20–24 | 334,309       | 329,009                            | 0.43                | 141,474                |
| 25–29 | 290,300       | 285,000                            | 0.71                | 202,350                |
| 30–34 | 661,005       | 660,705                            | 0.79                | 521,957                |
| 35–39 | 710,156       | 709,856                            | 0.80                | 567,885                |
| 40–44 | 627,213       | 626,913                            | 0.82                | 514,069                |
| 45–49 | 316,558       | 316,258                            | 0.82                | 259,332                |
| 50–54 | 252,956       | 252,656                            | 0.82                | 207,178                |
| 55–59 | 163,348       | 163,048                            | 0.82                | 133,699                |