Beyond the Battlefield: The Impact of War on Expatriates' Health and Livelihoods*

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Abstract

Wars impose costs not only on those in conflict zones but also on millions of expatriates who remain abroad. We provide new evidence on how home-country conflict affects the mental health and labor market outcomes of migrants. Using Russia's 2022 invasion of Ukraine as a natural experiment and comprehensive Swedish administrative data, we show that Ukrainian expatriates experience immediate and persistent mental health deterioration—a 30 percent increase in psychiatric prescription use that remains elevated three years later—while simultaneously increasing employment and earnings. Results replicate in European and US survey data. A simple framework helps rationalize the results: concern for family safety worsens mental health, while heightened financial responsibilities raise labor supply. Consistent with reduced reservation wages, Ukrainians take on secondary jobs, accept positions at lower-paying firms, and earn less than comparable coworkers. Earnings effects concentrate among migrants from more war-exposed regions, while mental health effects attenuate in Swedish municipalities with more Ukrainian refugee arrivals. The findings show that the welfare costs of war extend beyond national borders through diaspora populations.

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1 Introduction

"at first glance every bombed house in the photo
looks like your own

every child sleeping in the kyiv metro
has the face
of your daughter"
— Iryna Shuvalova (2022)[1]

How do expatriates cope when armed conflict erupts in their homeland? The question is increasingly salient. An estimated 304 million people live outside their country of birth (UNDESA, 2024), while state-based armed conflicts have reached a record high since systematic data collection began in 1946 (Rustad et al., 2025). Emigrants maintain deep ties to their origin countries: global remittance flows to low- and middle-income countries surpass both foreign direct investment and official development assistance combined (Kim et al., 2024; World Bank, 2024). A large literature has documented the devastating consequences of conflict for populations who directly experience violence (Blattman and Miguel, 2010; Mueller, 2013; Federle et al., 2026), and a growing body of work examines the health and economic trajectories of refugees who flee (Fazel et al., 2005; Steel et al., 2009). Yet we know remarkably little about the millions of expatriates who are already settled abroad when conflict arises in the home country—individuals who are physically safe but remain bound to affected regions through family, financial obligations, and emotional attachment.

This article studies how war in the country of origin affects expatriates. To do so, we focus on the Russian invasion of Ukraine in February 2022. Before the invasion, millions of Ukrainians and individuals with Ukrainian ancestry lived in countries such as the United States, Canada, Poland, and Russia.[2] News reports following the invasion describe Ukrainian expatriates' intense stress and anxiety in the immediate aftermath of the invasion, notably detailing how they experience the war through close and regular contact with family members still in Ukraine.[3]

We focus on Sweden, where more than 10,000 Ukrainians resided before the invasion, and study the impact of the invasion on Ukrainians' mental health and labor market outcomes until the end of 2024. To structure our analysis, we develop a simple framework in which war affects expatriates through two channels. First, a *mental health channel*: concern for the safety of family and friends (Kristensen et al., 2012), as well as collective trauma from observing one's home country under attack (Hirschberger, 2018), worsen mental health and raise the marginal disutility of work, potentially reducing employment and earnings (Lundborg et al., 2014; Lund et al., 2024).[4]

[1] From "Kyiv-Nanjing," translated from Ukrainian by Amelia Glaser and Yuliya Ilchuk. Published in *Literary Hub*, March 24, 2022.

[2] In 2020, around 6.1 million individuals born in Ukraine lived abroad (UN, 2020). Extending the group to individuals with Ukrainian ancestry, the number is notably higher. In the US alone, there are 1 million Americans of Ukrainian descent (Rodriguez and Batalova, 2009).

[3] Figure A.1 displays a selection of newspaper headlines written about Ukrainians living abroad.

[4] A related concept, *secondary trauma*, occurs when individuals experience distress from learning about a traumatic

Second, a *financial provision channel*: the displacement, diminished earnings, or destroyed wealth of close ones raises the marginal value of transfers and thus the return to earning income.[5] The net effect on labor supply is therefore ambiguous. The model shows that when the provision motive dominates, migrants increase labor supply despite worsening mental health—accepting lower reservation wages and lower-quality jobs—and that these labor supply responses should be concentrated among migrants whose close ones face greater war exposure, while mental health effects may be more broadly shared.

To measure the mental health status of Ukrainian expatriates, we use administrative data covering all medical prescriptions for anxiety, insomnia, and depression. An advantage of our setting is that the Swedish healthcare system provides universal health coverage at low out-of-pocket expense for residents regardless of nationality. To analyze labor market outcomes, we rely on high-frequency register data on employment, earnings, and job characteristics. We identify the causal effect of indirect exposure to war in the home country by using a matched event study strategy, comparing the outcomes of Ukrainian migrants to a matched subset of migrants from other countries. Given the possibility of immigration from Ukraine in response to the invasion or selective migration in anticipation of the war, we restrict attention to a balanced sample of migrants residing in Sweden for at least three years before the invasion and follow them until the end of 2024.[6] For all practical purposes, however, the invasion was sudden and unexpected. Despite the significant deployment of troops near Ukraine in the months leading up to February 2022, there was significant uncertainty about whether an invasion would in fact take place (Driedger and Polianskii, 2023).

We find that Russia's invasion prompts an immediate increase in mental health prescription uptake among Ukrainian expatriates in Sweden. In the first quarter of 2022, the probability of filling a prescription for any mental health drug increases by 1.6 percentage points, a 30 percent increase over the pre-invasion mean. The increase is driven by a rise in prescriptions for anxiety and insomnia, which are typically used to treat sudden and acute symptoms of mental stress. Prescriptions of anti-depressants, on the other hand, start to increase significantly in the second half of 2022. This delay is consistent with a substitution away from medications used to treat acute symptoms to those that are used for more long-term mental health conditions (National Board of Health and Welfare, 2021). In line with this, we show that the increase in anti-depressants is driven mostly by individuals having previously received drugs for acute symptoms. We also find an increase in mental health-related visits to health clinics, showing that results are driven by changed behavior of Ukrainians and not by doctors' leniency following the invasion.

The increase in Ukrainians' mental health prescriptions is persistent. In late 2024, nearly

event experienced by others, such as through friends or media exposure (Cieslak et al., 2013). Those who share a social identity with victims are especially likely to follow media coverage of such events (Relihan et al., 2023), which can amplify their distress (Neria and Sullivan, 2011).

[5]Reduced return intentions may reinforce this channel by increasing migrants' willingness to invest in the host country labor market (Bassetto and Freitas Monteiro, 2024; Aksoy et al., 2024).

[6]In robustness tests, we show results using the unmatched sample, using an unbalanced sample that allows individuals to emigrate post-invasion, as well as using a synthetic difference-in-differences design.

three years after the invasion, prescriptions for mental health drugs remain significantly higher among Ukrainians than among other migrants. Moreover, the incidence of polypharmacy—the simultaneous use of multiple types of mental health drugs—also increases over time, consistent with lasting and increasing severity of symptoms.

Turning to labor market effects, we observe a short-term decrease in earnings in the first quarter of the invasion, followed by significantly increased earnings through to the end of our sample period in 2024. The positive earnings effect is consistent with the financial provision channel dominating the mental health channel in our framework, and several pieces of evidence point to it being driven by increased hours worked and reduced reservation wages. We observe lower rates of sickness absences and higher rates of holding multiple jobs. Conditional on employment, Ukrainians hold lower-quality jobs post-invasion, as evidenced by working at lower-paying firms and earning less than coworkers, even when controlling for education. An earnings-residual approach indicates that, following the invasion, Ukrainians earn less than expected given their age, gender, education, and experience in Sweden.

As a sharper test of the reservation wage channel, we examine migrants who were already unemployed before the invasion, focusing on both the speed of exit from unemployment and the quality of jobs accepted upon exit. Following the invasion, Ukrainian job seekers exit unemployment significantly faster — the quarterly exit hazard rises by 6.2 percentage points in 2022, a relative increase of roughly 20 percent compared to the pre-invasion mean. Moreover, the jobs accepted upon exit are of substantially lower quality, with significantly lower firm wages, own earnings, earnings residuals, and within-firm relative rank conditional on education.

We next turn to the question of external validity. Since Swedish labor market and health care institutions may shape how expatriates respond to a shock, it is not clear that Ukrainians in different countries would react in the same way. Using a similar sample definition and event study on the American Community Survey, we find large increases in earnings as well as an increased likelihood of working 40 hours or more per week. A similar strategy on the European Social Survey indicates a reduction in self-reported happiness and life satisfaction among Ukrainian expatriates in response to the invasion.

Our framework predicts that the financial provision motive — and thus the labor supply response — should be strongest among migrants from regions with greater conflict intensity, where the financial needs of close ones are most acute. To test this, we use newly assembled text data on the birth towns of migrants to match Ukrainian expatriates to their region (oblast) of origin. Since some oblasts experience a large number of fatalities, while others have close to none, this provides variation in the likelihood that close ones are exposed to danger or forced displacement. We find that mental health effects are somewhat larger for those originating from more war-exposed oblasts, but that individuals from less exposed regions also display positive and significant responses. Labor market effects are, however, driven entirely by more war-exposed origins. This is consistent with a greater need to provide financially for close ones, while the

mental health shock is more universal to all Ukrainians.[7]

We also study the inflow of Ukrainian refugees across Swedish municipalities. Upwards of 50,000 Ukrainians arrived during 2022, most of them in the immediate aftermath of the invasion. Using data on the number of refugees that were placed by the Swedish Migration Agency across municipalities, we find that higher refugee reception has a dampening effect on mental health issues. This effect holds with municipality-by-year fixed effects and is consistent with closer contact with conationals improving mental health among expatriates.

We consider and rule out alternative mechanisms. The war may strengthen Ukrainians' intention to stay in Sweden, leading them to increase their labor supply as an investment in their future career or to maintain a valid work permit (Adema et al., 2024; Aksoy et al., 2024; Bassetto and Freitas Monteiro, 2024). However, we find similar effects among Ukrainians who are predicted to already have long-term intentions to stay in Sweden. Another alternative mechanism is that the invasion may have led to positive discrimination from employers, such that labor *demand* rather than labor supply explains the increase in earnings and employment. We show, however, that labor market effects are very similar across Ukrainians who were actively searching for work, as measured by registration with the Public Employment Service before the invasion, and those who were not in the labor force. This indicates that effects are due to changes in labor supply, rather than preferential treatment by employers.

Lastly, we find an increase in mental health prescriptions among Russian expatriates, which is smaller in both absolute and relative terms compared to the effects we observe among Ukrainians. We observe no effect on labor market outcomes. This is consistent with Russians also experiencing distress from the war, potentially due to a combination of stigma, sympathies with Ukraine, and fear of war exposure among their families, but with no added financial burden affecting their labor market outcomes.

Prior research has found a link between mental health and labor market outcomes (e.g. Lundborg et al., 2014; Banerjee et al., 2017), raising the possibility that migrants' exposure to home-country shocks may contribute to native-immigrant gaps in labor market outcomes (Brell et al., 2020). We uncover a novel phenomenon, in which migrants have *higher* employment and earnings despite being exposed to conflict-induced stress. This pattern is consistent with a transnational "added worker effect" (Fadlon and Nielsen, 2021), in which expatriates adjust labor supply in response to shocks affecting dispersed household members, connecting our findings to the literature on intra-household risk sharing and remittances (Townsend, 1994; Amuedo-Dorantes and Pozo, 2006, 2011; Mota, 2025). However, the combination of increased labor supply and persistent mental health deterioration may not be sustainable: we find that treatment for burnout—a condition of extreme fatigue tied to occupational stress—increases among Ukrainians in the years following the invasion. We also contribute to the literature on immigrant occupational mismatch, which has emphasized imperfect transferability of foreign human capital (Mattoo et al., 2008; Chiswick and

[7] Below, we discuss the possibility that greater war exposure reduces intentions to return to Ukraine, which could itself affect labor market outcomes.

Miller, 2009), by showing that mismatch can adjust sharply in response to exogenous geopolitical shocks rather than evolving only through slow assimilation.

This study also relates to a growing literature studying the impact of home-country shocks on emigrants. Previous studies have found effects of macroeconomic volatility (Akay et al., 2017; Nguyen and Connelly, 2018), natural disasters (Bharadwaj et al., 2024), and terrorist attacks (Sønderskov et al., 2021; Keita and Schewe, 2021; Aksoy et al., 2024; Bassetto and Freitas Monteiro, 2024) on expatriates' mental health, educational investments, and job search. Focusing on the 2022 invasion specifically, research has documented high levels of anxiety, PTSD, and depression among Ukrainian residents (Kurapov et al., 2023; Chudzicka-Czupała et al., 2023; Długosz, 2023; Lushchak et al., 2024). Foged et al. (2026) document high rates of PTSD among Ukrainian refugees in Denmark, which is associated with lower employment, while Adema et al. (2024) find that conflict in the home region decreases Ukrainian refugees' likelihood to return there but does not affect employment. We contribute to this literature by (i) integrating both mental health and labor market outcomes using high-frequency administrative data, (ii) conducting long-run analysis up to three years post-conflict, (iii) studying the extensive margin of a major conflict rather than within-conflict variation, (iv) showing that results are not driven by changed return intentions, and (v) demonstrating that effects extend to the broader national diaspora without a refugee background.

The remainder of the paper is organized as follows. Section 2 provides background on the Russian invasion and presents the conceptual framework. Section 3 describes the data, sample construction, and empirical strategy. Section 4 presents our main results on mental health and labor market outcomes, along with robustness checks. Section 5 assesses external validity using data from the United States and Europe. Section 6 examines mechanisms, including heterogeneity by conflict exposure, refugee reception, return intentions, and alternative explanations. Section 7 studies effects on Russian expatriates. Section 8 concludes.

2 Background

2.1 The Russian Invasion of Ukraine

Ukraine and Russia have ties that go back centuries. Following the dissolution of the Soviet Union in 1991, Ukraine declared its independence and, in the following years, developed a relationship with Russia that had elements of both cooperation and tension. The relationship took a dramatic turn with Russia's annexation of Crimea in 2014, a move that was widely condemned by the international community and considered illegal under international law. This was followed by the conflict in the Donbass region, where Russian-backed separatists declared independence, leading to an ongoing conflict with Ukrainian forces (Plokhy, 2015).[8]

Starting in March of 2021, Russia led a significant buildup of military forces along the Ukrainian border. Despite these signs, there was considerable uncertainty and debate among international

[8]Our results do not rely on individuals directly influenced by these events, as less than 6% of our sample is comprised of individuals from Crimea and Donbass arriving in Sweden since 2014.

observers and governments about whether Russia would indeed proceed with an invasion (Zwack et al., 2021; Astrov et al., 2022; Driedger and Polianskii, 2023). This uncertainty was partly due to mixed messages from the Russian government, which consistently denied any intention to invade, while simultaneously engaging in aggressive rhetoric and military posturing (Kiely and Farley, 2022). According to Russia, a significant motivation for the military buildup was the desire to prevent Ukraine from moving closer to Western institutions, primarily NATO. In the months preceding the invasion, Russia requested guarantees that Ukraine would not join NATO, and intense efforts of diplomacy attempted to dissuade an invasion. Despite the accumulating evidence of imminent military action, the exact intentions of the Kremlin remained difficult to ascertain (Fox and Isachenkov, 2022), and Ukraine and the international community were therefore largely unprepared for the invasion. On February 11, 2022, thirteen days before Russia's invasion, the US national security advisor declared that there was an "immediate" threat of invasion, and several Western embassies began to evacuate from Kyiv in the following days (Walker, 2022).

The Russian invasion on February 24, 2022, unfolded rapidly, with Russian forces launching a multi-pronged offensive that aimed to seize key Ukrainian cities and military installations. The initial phase of the invasion saw a combination of air strikes, missile attacks, and ground operations, targeting military facilities as well as critical infrastructure. The immediate results of the warfare were devastating: urban areas, especially in the east and the west, witnessed severe damage or destruction of residential neighborhoods, hospitals, and power plants. Civilians remaining in conflict zones faced dire circumstances, with access to food, water, medical care, and electricity severely limited (Roy, 2023).

The conflict has had a profound humanitarian impact, triggering one of the largest refugee crises in Europe since World War II. Neighboring countries, including Poland, Slovakia, Hungary, Romania, and Moldova, opened their borders to Ukrainian refugees, who sought safety and shelter. The EU activated the Temporary Protection Directive for the first time since its establishment, providing immediate and collective protection measures for displaced people fleeing from Ukraine (IOM, 2024). According to the latest estimates, there are 6.5 million Ukrainian refugees and 3.7 million internally displaced individuals in Ukraine (UNHCR, 2024).[9] Since the start of the war, over 14,000 Ukrainian civilians have been killed, and more than 35,000 injured (UN, 2025).[10] Moreover, 28,000 have been claimed to be held captive by Russia against their will (Kyiv Post, 2023). Military deaths have been estimated at 73,000–140,000 for the Ukrainian forces, and 190,000–350,000 on the Russian side (Economist, 2025). It is important to note that there is significant uncertainty in these estimates, as estimates vary widely by source. The invasion also inflicted severe damage on Ukraine's economy, leading to a significant GDP contraction of 29% in 2022, as well as destruction of infrastructure and exports (Reuters, 2023).

[9] See Figure A.2 for asylum applications in Sweden.

[10] See also Figure A.3 for statistics on Ukrainian civilian casualties over time.

2.2 Conceptual Framework

To guide the empirical investigation, we developed a simple, static model for understanding how home-country conflict affects expatriates as they navigate competing demands on their well-being and resources. We summarize the key elements here and the full model appears in Appendix B.2.

Consider a migrant who derives utility from their own consumption, leisure, and the well-being of family members remaining in the origin country. The migrant sets labor supply and transfers to family members under a standard budget constraint. War affects the migrant's labor supply through two channels operating in opposite directions. First, a *mental health channel*: concern for family safety, exposure to distressing news, and collective trauma reduce mental health, increasing the marginal disutility of work. Second, a *financial provision channel*: war reduces family resources because of lost income, displacement, or destruction of assets, which raises the marginal value of transfers and thus the return to earning income.

Due to the two competing forces, the effect of war on labor supply is ambiguous. When the financial provision motive dominates, migrants increase labor supply despite worsening mental health. In this case, the reservation wage falls, and migrants are willing to work for lower wages, trading their own well-being for the capacity to support close ones. By extension, migrants will be willing to take on lower-quality jobs for which they are overqualified. If the mental health channel dominates, we instead expect to see lower employment and earnings as individuals' work utility decreases.[11]

The model also generates predictions about heterogeneity. If the financial provision channel drives labor supply, the effects should be concentrated among migrants from regions with greater conflict exposure, for whom family needs are most acute. Local refugee arrivals have an ambiguous effect on mental health a priori: arrivals may alleviate stress by increased contact with conationals that provide support, or may increase stress through reminders of trauma or local congestion. These predictions are used to guide the analysis throughout the paper, most notably in Section 6 on mechanisms.

3 Empirical Strategy

3.1 Data

We use full-population Swedish administrative data covering information on demographics, income sources, and medical prescriptions between 2019 and 2024, which we aggregate to the quarterly level. Labor market outcomes are measured using monthly data on gross earnings. We also observe unique employer IDs at the firm-plant level (between 2019-2023), enabling us to distinguish if individuals hold multiple jobs and to record firm and job characteristics.

[11] The framework also clarifies how to interpret mental health measures which are based on filled prescriptions. Prescriptions reflect both the latent burden of mental health symptoms and healthcare access. War may increase prescriptions by worsening the burden, by improving access (e.g., through targeted outreach), or both. We explore the role of healthcare access in Appendix section **??**.

Mental health outcomes are based on all medical drugs (with ICD codes) prescribed and *collected* at a pharmacy in Sweden. Importantly, the Swedish healthcare system provides universal health coverage for residents regardless of their nationality, meaning that foreign nationals are covered as long as they have formal residency. A price subsidy ensures that a patient pays at most 2,850 SEK (≈$270) for medication over a 12 month period. After reaching this limit, the patient gets all additional medication at no out-of-pocket expense. Thus, access to medications is less likely to be mediated by socioeconomic status than in settings where individuals rely on employer-sponsored or private health insurance to avoid being charged for medical expenses.

The analysis of mental health focuses on prescriptions for medications treating anxiety, insomnia, and depression. Physicians follow national guidelines on how to treat patients with anxiety and depression (National Board of Health and Welfare, 2021). Medications for insomnia and anxiety can have an instant effect and are usually prescribed for short-term or needs-based usage. Due to their addictive nature, they are ill-suited for longer-term use. Anti-depressants, on the other hand, are only given to individuals with persistent issues and may take months to reach full effect (Harmer et al., 2017; WHO, 2009). Table A.1 lists all medications included in our analysis, which comprise the most commonly used drugs for each respective condition.

3.2 Sample

The sample consists of immigrants in Sweden who are above the age of 15 and under 65 in 2021, the year prior to the invasion, and includes all origin countries that have at least 30 people per year in the administrative data. Immigrants' country of origin is defined as their country of birth. To avoid issues of selection into the sample, we only include individuals who reside in Sweden since 2019, three years before the invasion, and remain in the country until the end of 2024. To avoid capturing spillover effects on other migrants from countries that are also close to the war, we exclude migrants from Russia and European countries that share a border with either Ukraine or Russia. We study the effects on Russian expatriates separately in Section 7. Less than 6% of our sample consists of individuals who immigrated since 2014 and were born in Crimea or Donbass. Our results are therefore unlikely to be driven by individuals leaving Ukraine due to Russia's annexation of Crimea or Russian-backed separatism in Donbass.

Our main analysis uses a matched sample of Ukrainians and migrants from other countries. In order to construct a comparison group of non-Ukrainian migrants who resemble Ukrainian-born migrants in their pre-invasion characteristics and local contexts, we use exact matching combined with nearest-neighbor propensity score matching. We first stratify observations by county of residence and gender, restricting potential matches of Ukrainians and other migrants within the exact county–gender cell. This ensures that all comparisons occur within identical local labor market environments and gender-specific contexts. Within each exact-match stratum, we then estimate a propensity score using a probit model predicting the probability of being Ukrainian-born. The model includes the following baseline covariates measured in 2020: age, presence of children, marital status (married to a Swedish-born partner, married to another migrant), visa type

(family reunification, work, student, other, or refugee status), Swedish citizenship, years in Sweden, any university education, and mean family and individual income for the years 2020–2021. The model is used to perform nearest-neighbor matching without replacement, selecting up to two control units for each treated unit, subject to a caliper restriction of 0.01 on the propensity score. In other words, matches are only formed if the absolute difference in propensity scores between a Ukrainian and a potential control is less than 0.01.

Table 1 displays descriptive statistics for the matched sample, with 8,771 Ukrainians and 17,350 individuals in the control group. As expected, the matching procedure produces balance on the included covariates. The distribution of origin countries in the control group is displayed in Table A.2. As a robustness test, we also show results using the full, unmatched sample in Section 4.3, as well as other alternative sample definitions.[12]

3.3 Estimation

To estimate the impact of the invasion on the outcomes of Ukrainian expatriates, we use the following event-study specification:

$$Y_{it} = \alpha_i + \lambda_t + \sum_{\substack{k=-7 \\ k\neq 0}}^{12} \beta_k \times \text{Ukraine}_i \times \mathbb{1}[t = k] + \varepsilon_{it}, \tag{1}$$

where we regress the outcome variable Y_{it} of individual i in quarter t on individual fixed effects α_i and a series of quarter fixed effects λ_t interacted with the *treated* group Ukraine_i. We normalize the coefficients relative to the quarter before the start of the war, setting $t = 0$ as the reference period and Q1 of 2022 as $t = 1$. The parameters of interest are β_t, $t \in (1, 12)$. Considering that the treatment is at the level of one's country of origin, we cluster the standard errors at the country level. Below, we show robustness when applying permutation inference on pairs for the matched sample (Rosenbaum, 2002), permutation inference at the country level using the unmatched sample (Abadie et al., 2010), or inference using Synthetic Difference-in-Differences (Arkhangelsky et al., 2021).

To provide a more aggregated description of the effects on the invasion, we also estimate difference-in-differences models with coefficients that show impacts year-by-year after the invasion:

$$Y_{ity} = \alpha_i + \lambda_t + \sum_{k=2022}^{2024} \beta_k \times \text{Ukraine}_i \times \mathbb{1}[y = k] + \varepsilon_{ity}, \tag{2}$$

where y indexes years and effects are estimated relative to the pre-invasion average.

Our primary labor market outcome is average monthly earnings per quarter. For mental health, we use *Any drug*, a dummy variable indicating whether an individual picks up any prescription

[12] Table A.3 provides descriptive statistics for the unmatched sample. The distribution of countries is displayed in Table A.4.

treating anxiety, insomnia or depression in a given quarter. Patients actively undergoing treatment are expected to fill their prescriptions at least once per quarter.[13]

In Section 4.3 we consider several extensions and alternative approaches to test the robustness of our results, such as using the full, unmatched sample and including post-invasion emigrants in the sample.

4 Main results

4.1 Mental health

Figure 1 displays the event-study plot for mental health outcomes before and after Russia's full-scale invasion of Ukraine in February, 2022. Panel A shows that in the same quarter as the invasion, mental health prescriptions increase sharply by 1.6 percentage points. Relative to the pre-invasion mean of 5.6 percent among Ukrainians, the effect represents a relative increase of nearly 30 percent. Prior to the invasion, we see that the Ukrainians and matched controls do not show statistically significant differences in prescription levels, nor any diverging trends that would indicate that Ukrainians were otherwise trending towards having higher prescriptions.

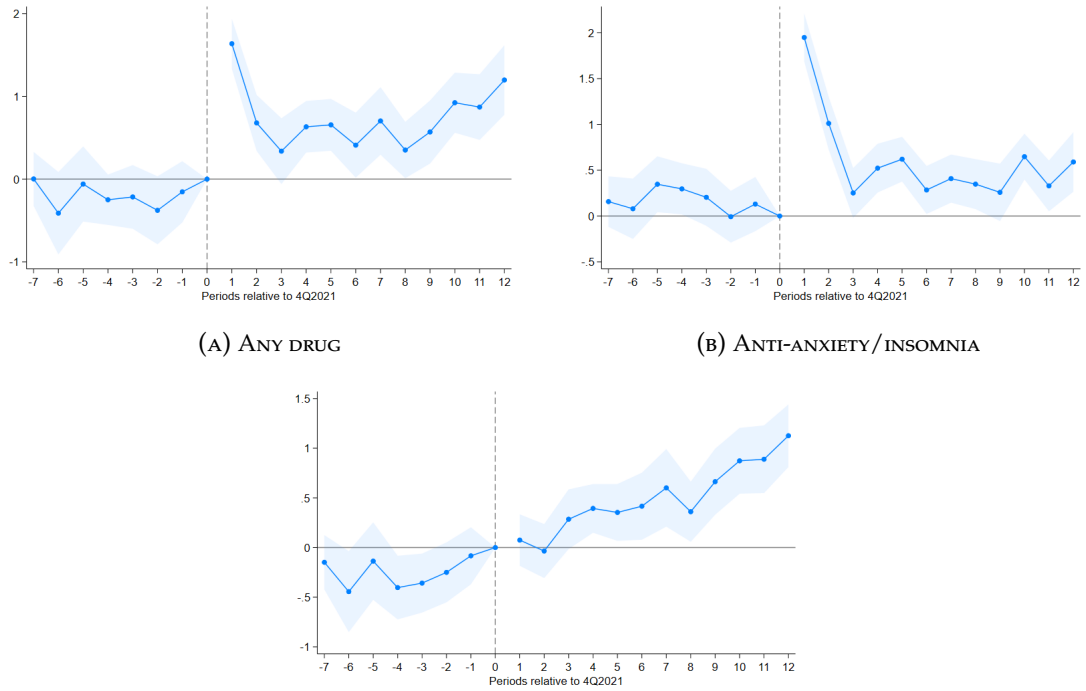
The increased take-up of mental health drugs among Ukrainians is persistent. In the second quarter after the invasion, levels are reduced but remain significantly higher compared to the control group. This effect remains over the full three-year period of our sample. Moreover, rather than diminishing over time, the results show an increase in take-up in 2024, potentially related to the increase in war fatalities that occurred in this period. Table 2, column 1, displays the corresponding yearly estimates, showing that the prescriptions effect is as high in 2024 as in 2022.

To examine if the increase in mental health prescriptions is driven by the extensive or intensive margin, we first split the sample by those who had any prescription 2018–2019 and those who did not. Figure A.4 displays event-study plots within each sample split, showing positive responses on both margins. To determine their relative weight for the overall result, we perform a decomposition exercise using a simple difference-in-differences specification. The extensive margin (i.e., new users) contributes to nearly 70 percent of the overall effect.[14] Interestingly, while the intensive margin has a smaller contribution to the overall effect due to the lower number of prior users, the treatment effect in this group is nearly twice as large. This may, for example, be driven by an increased sensitivity to mental health shocks in this group, as well as lower barriers to access given the history of mental health treatment.

[13] In Sweden, doctors provide prescriptions that enable the patient to pick up the same medication on multiple occasions, with the restriction that they can not pick up more than a 90-day supply at one time. To be eligible for the price subsidy, patients can only pick up a new box once they have used two-thirds of the last one.

[14] We estimate the model $Y_{it} = \alpha_i + \lambda_t + \beta \times \text{Ukraine}_i \times \text{Post}_t + \varepsilon_{it}$, as shown in Table A.5. Column 1 shows the full-sample estimate, column 2 shows the estimate on the subsample with no mental health prescriptions between 2018 and 2021, and column 3 shows the estimate for those with prior mental health prescriptions 2018–2021. For Ukrainians with and without prior prescriptions, $k \in \{0, 1\}$, let s_k be the share of Ukrainians in the subgroup and τ_k be their treatment effect. Then, the share of the overall effect driven by prior non-users is $s_0\tau_0/(s_0\tau_0 + s_1\tau_1)$. Note here that $s_0 = 0.815$.

FIGURE 1: MENTAL HEALTH EFFECTS



(A) ANY DRUG

(B) ANTI-ANXIETY/INSOMNIA

(C) ANTI-DEPRESSANTS

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on mental health prescription uptake among Ukrainian migrants in Sweden. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter. Panel B shows prescriptions for anti-anxiety or insomnia medications. Panel C shows prescriptions for anti-depressants. All outcomes are measured in percentage points (range: 0–100%). The sample includes Ukrainian migrants and matched control migrants. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Table 2 displays yearly estimates. Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

We next consider which types of mental health drugs that underlie our results. Panel B of Figure 1 shows that the initial spike in prescriptions is entirely driven by an increase in prescriptions for immediate relief, defined as anti-anxiety and insomnia medications. The effect of 1.95 percentage points at the onset of the invasion translates to a relative increase of over 62 percent compared to the pre-invasion level. The rate decreases in the following quarters, but remains significant at around 0.5 percentage points until the end of 2024, representing a 16 percent relative increase.

Anti-anxiety and insomnia drugs have instant effect, but should not be prescribed over longer time periods as they entail a risk of addiction. We therefore also study prescriptions of anti-depressants, which may be used for long-term mental health issues. Looking at anti-depressants in Panel C of Figure 1, we observe a steady increase in prescriptions over time. The effect becomes significant in the latter half of 2022. Three years after the invasion, in Q4 of 2024, the effect reaches 1.1 percentage points, corresponding to a relative increase of 35 percent. As anti-depressants are only prescribed for long-lasting symptoms, the increase is consistent with individuals experiencing

persistent conditions. Moreover, the evidence indicates that anti-depressants are being used as an alternate treatment for those with prior acute symptoms. Figure A.5 shows that we observe the largest increase in antidepressant use among those who have earlier been prescribed immediate-relief drugs. Our result that usage of anti-depressants is persistent and growing in magnitude over time is a strong indication that the intensity of the mental health shock does not dissipate over time.

Primary care visits Using primary data from Skåne, the third largest Swedish region, we investigate how Ukrainians' health care seeking behavior changed following the invasion. Columns 1–2 of Table A.6 show that overall health center visits do not change in 2022, while mental health-related visits see a clear increase.[15] In 2023 and 2024, however, overall visits among Ukrainians exhibit a significant increase. This is driven by visits for both mental health and other diagnoses, suggesting that Ukrainians may have developed other conditions due to the long term stress of the ongoing war.[16]

Severity and spillovers We next explore the question of the severity of mental illness in multiple ways. Column 1 of Table A.8 shows that polypharmacy—the likelihood of using multiple types of mental health prescriptions simultaneously —increases in all years. Column 2 shows that the number of distinct drug pickups at pharmacies increases. Column 3 shows that Ukrainians have an increased prescription rate of antipsychotics in 2022, a class of medicines used to treat severe symptoms such as delusions and hallucinations, as well as for treatment-resistant depression.

Next, we analyze in- and out-patient specialist health care. Column 1 of Table A.9 show an increase in specialist care for mental health conditions. The effect is significant in all years and grows somewhat over time. Due to the rarity of specialist mental health care, column 2 also shows aggregated results for all post-invasion years, showing relative increase of 12 percent over the mean.

Lastly, due to the intense and long-lasting mental stress that Ukrainian expatriates experience after the invasion, we investigate the impact on specialist health care for burnout. Burnout is typically observed as a result of long-term work-related stress. The diagnosis of burnout requires individuals to display prolonged periods of fatigue and substantial lack of mental energy or stamina, amongst other criteria (The National Board of Health and Welfare, 2003). In column 3 of Table A.9, we find that specialist treatments for burnout also increase. In particular, the aggregate estimate in column 4 indicates that treatment for burnout increases by 25 percent over the pre-invasion mean among Ukrainians.

[15] Corresponding event-study plots are shown in Figure A.15. The fact that overall visits do not increase despite an increase in mental health visits is likely due to mental health begin a small share of overall visits.

[16] To test if the Skåne sample is representative of our full sample, Table A.7 replicates our main results using Skåne, finding very similar effects.

4.2 Labor market outcomes

Our conceptual framework indicates that wars in migrants' home countries have theoretically ambiguous effects on their labor market outcomes. Two forces push labor supply in different directions. On the one hand, war increases the need to provide financial assistance to close ones who have reduced income and increased financial needs. On the other hand, the negative effect on mental health raises the disutility from work. Looking at average monthly earnings in Panel A of Figure 2, we observe a short-term decrease that lasts for one quarter, of approximately 500 SEK per month. This negative effect quickly switches signs, however, and Ukrainians' earnings increase by approximately 1,000 SEK through 2022, a four percent relative increase compared to the pre-invasion mean. Similar to the case with mental health, the effect is persistent, with Ukrainians' earnings remaining significantly higher until the end of 2024. Consistent with this, Panel B shows a spike in sickness absence in the first quarter of 2022, after which sickness absences become significantly less common than before.

Panel B of Figure 2 shows that Ukrainians also increase their employment rate by approximately 2 percentage points, a relative increase of 3 percent. In Table A.10, column 1, we investigate the effect on earnings separated by pre-invasion labor market status. The largest absolute increases in earnings come from the previously non-employed, who also have larger increases in employment after the invasion. However, we also observe significantly increased earnings and employment rates from those who were previously employed.

4.2.1 Hours worked and reservation wages

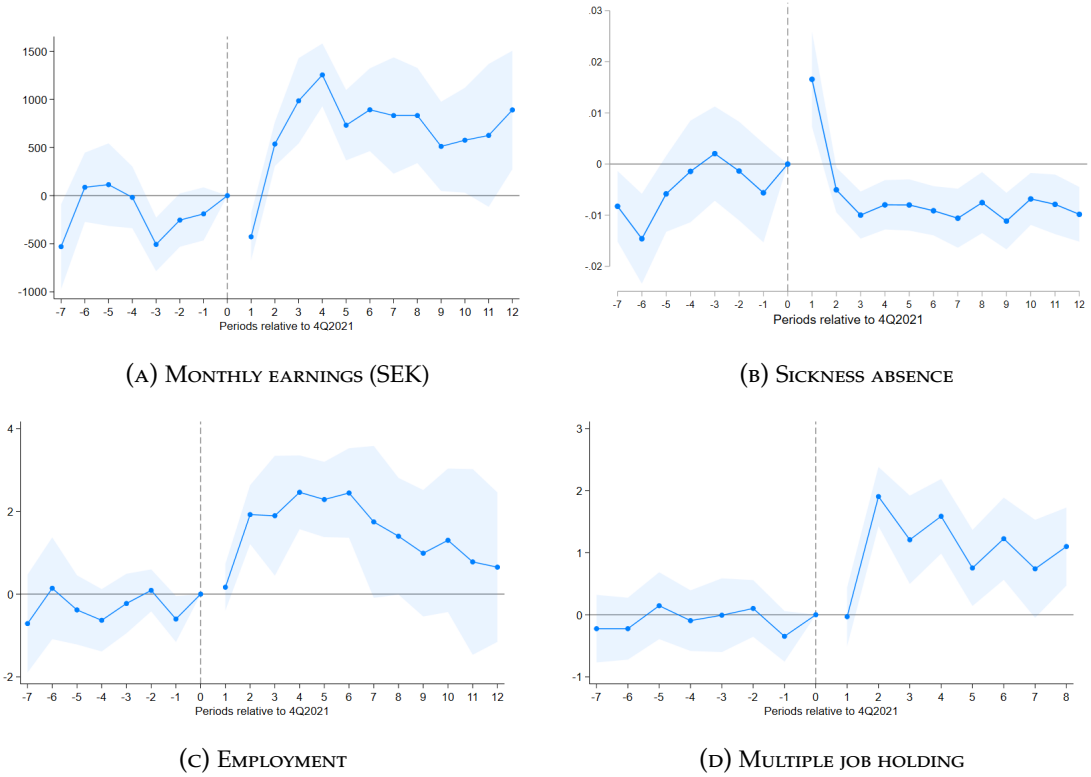
In light of our conceptual framework, the positive earnings result suggest that the financial provision channel dominates the mental health channel. In other words, rising financial needs of close ones had a stronger impact on labor supply decisions than the negative mental health shock associated with the war. An important downstream prediction of the model is that increased earnings are driven by a reduction of reservation wages in addition to increased hours of work. Below, we provide several tests in line with both channels.[17]

First, we note that sickness absences are significantly lower despite an increase in employment. All else being equal, we would otherwise have expected a mechanical *increase* in absences, since sick leave is a social benefit that is conditional on employment. Instead, observing lower sickness absence is consistent with Ukrainians having fewer missed hours of work, possibly despite being sick, after the invasion.

Second, Panel D of Figure 2 shows a sharp increase in multiple job holding among Ukrainians after the invasion. Working more than one job is related to financial needs and higher hours worked, for example when the primary job has inflexible hours (Campion et al., 2020). The observed increase of 1 to 2 percentage points represents a significant relative effect give the pre-invasion mean of

[17] While we do not directly observe hours worked in our Swedish data, we provide suggestive evidence here as well as direct evidence in Section 5 using the American Community Survey.

FIGURE 2: LABOR MARKET OUTCOMES



(A) MONTHLY EARNINGS (SEK)

(B) SICKNESS ABSENCE

(C) EMPLOYMENT

(D) MULTIPLE JOB HOLDING

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on labor market outcomes among Ukrainian migrants in Sweden. Panel A shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). Panel B shows sickness absence, measured as receive any sick leave benefits in a given quarter (range: 0–100%). Panel C shows employment, measured as the share of months with positive earnings within each quarter (range: 0–100%). Panel D shows the probability of having multiple jobs, defined as having more than one employer in a quarter. Information about number of employers is not available for 2024. The sample includes Ukrainian migrants and matched control migrants. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Table 2 displays yearly estimates. Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

10.5 percent. Column 3 of Table A.10 shows that multiple job holding increases also for those who were employed before the war, consistent with an increase in hours. Moreover, the increase in employment among the previously non-employed, shown in Table A.10, also indicates an increase in hours worked.

Lastly, we consider reservation wages. Multiple pieces of evidence indicate a reduction. Table A.10 shows that multiple job holding increases substantially for those unemployed prior to the invasion. The rapid transition from being a job seeker to holding multiple jobs is difficult to reconcile without reduced reservation wages. Table 3 then presents results for the characteristics of first and second jobs, conditional on being employed (Panel A) or having at least two jobs (Panel

B).[18] The first and second jobs are defined as one's highest and second-highest earning positions. Column 1 shows that Ukrainians' post-invasion jobs tend to be in firms that have lower average earnings, especially for the second job. In line with this, column 2 indicates that Ukrainians' own earnings in the second job are significantly lower than those of other migrants after the invasion. To take into account that new hires may have lower pay due to their age, education, or experience, column 3 shows impacts on Mincerian earnings residuals. We find that in both the first and second jobs, Ukrainians tend to have lower-than-expected earnings.

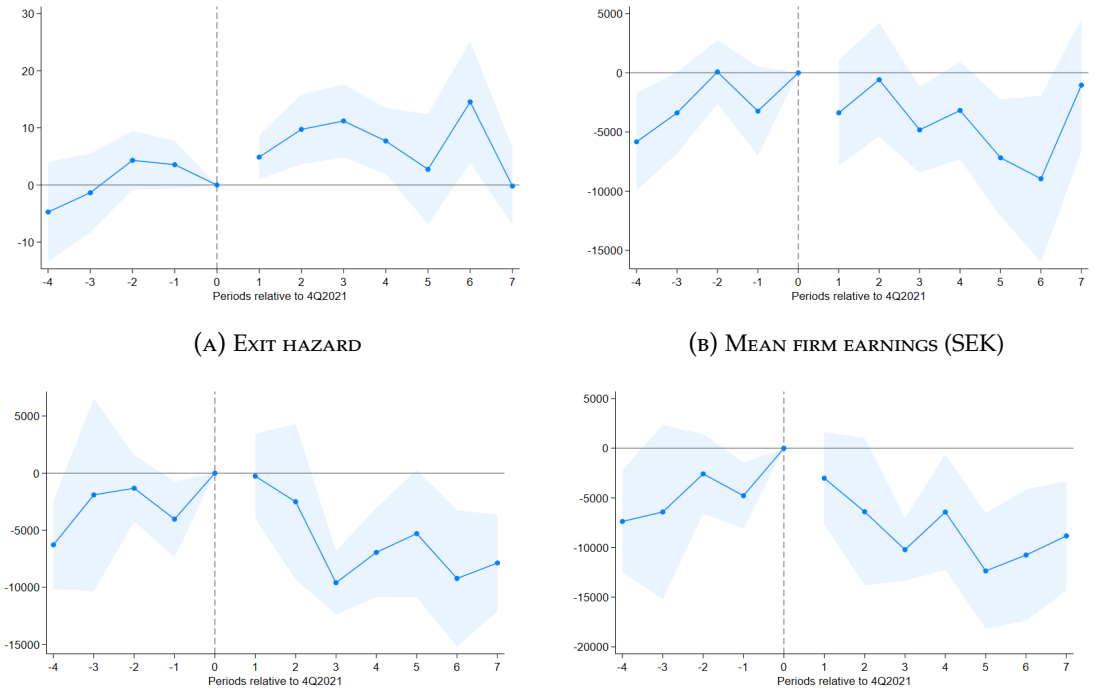
In column 4 of Table 3, we compare workers to their colleagues within the workplace. This shows that Ukrainians have lower earnings rankings within the workplace, accounting for their level of education. Finally, column 6 in Panel B shows that Ukrainians are less likely to have a second job in the same sector as their first, an indication of poor outside options. However, these estimates are not statistically significant. In Table A.11 we instead look at job quality measured by the occupation, rather than firm, finding consistent effects.

As a sharper test of the reservation wage channel, we next examine migrants who became unemployed prior to the invasion, between 2020Q3 and 2021Q4. We then study their speed of exit from unemployment and the quality of the jobs they accept upon exit. Panel A of Figure 3 shows that before the invasion, the exit hazard displays no differential pre-trends between Ukrainian and control migrants, supporting the parallel trends assumption. Following the invasion, Ukrainian job seekers exit unemployment significantly faster. The quarterly exit hazard increases by 6.2 percentage points in 2022, a relative increase of approximately 20 percent compared to the pre-invasion mean of 30.9 percentage points, as shown in Column 1 of Table A.12.

The jobs that Ukrainians accept upon exit from unemployment are of substantially lower quality. Panels B through D of Figure 3 show a gradual deterioration in job quality outcomes in the post-invasion period. Aggregating to the yearly level, Columns 2 through 4 of Table A.12 show that, in 2023, Ukrainians exit into firms with significantly lower average earnings (−4,661 SEK, approximately 15 percent below the pre-invasion mean), have significantly lower own earnings at exit (−4,964 SEK, approximately 24 percent below the pre-invasion mean), and display significantly more negative Mincerian earnings residuals even after controlling for age, education, and years in Sweden (−7,476 SEK). Column 5 shows that already in 2022, Ukrainians rank significantly lower within their firm relative to colleagues with similar education levels, falling by 9.3 percentile points relative to the pre-invasion mean rank of 50.5. Taken together, these results provide evidence that the invasion led previously unemployed Ukrainians to accept lower-quality jobs than they would otherwise have taken, consistent with a reduction in reservation wages.

[18] Tables A.16–A.18 describe the sectoral and occupational composition of Ukrainian migrants' employment. The most common sectors include education, health care, construction, and building services, while the most common occupations include IT professionals, cleaners, personal care workers, and teachers.

FIGURE 3: EXIT HAZARD AND JOB QUALITY OUTCOMES: UNEMPLOYED BETWEEN 3Q2020 AND 4Q2021



(A) EXIT HAZARD

(B) MEAN FIRM EARNINGS (SEK)

(C) EARNINGS (SEK)

(D) EARNINGS RESIDUAL

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on exit from unemployment and accepted job quality. The sample consists of Ukrainian migrants and matched control migrants with unemployment spells beginning between 2020Q3 and 2021Q4. Panel A shows the quarterly exit hazard in percentage points. Panels B through D show job quality measures in the first quarter of employment following exit, conditional on exiting. Panel B shows mean earnings at the exit firm, defined as the leave-one-out average earnings across all workers at the firm. Panel C shows the individual's own earnings at exit. Panel D shows earnings residuals from a Mincer regression controlling for age, education, and years in Sweden. Earnings are measured in 2024 SEK value (100 SEK ≈$11). All specifications control for spell duration and entry cohort fixed effects. Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

4.3 Robustness

Alternative sample definitions. The main analysis uses a matched sample of individuals based on their pre-period characteristics. In Figure A.6 we show event-study results using the full, unmatched sample. The results indicate a similar pattern and magnitudes of effects as in the main analysis. Prior to the invasion, both mental health and earnings show little evidence of pre-trends, with the figure indicating that Ukrainians had somewhat lower levels of both outcomes relative to the full set of immigrants. Nevertheless, it is reassuring that the unmatched sample yields the same conclusions as our main sample. Similarly, Figure A.7 and Table A.13 show that the exclusion of war-adjacent countries in Europe (such as Poland and the Baltics) are not crucial for our results, as including them in the control group produces similar results.

The main analysis restricts the sample to individuals who stay in Sweden until 2024. However,

the rate of emigration may have responded to the invasion. If there are differential emigration patterns across origins, this may lead us to focus on an unrepresentative sample of stayers. In Figure A.8 and Table A.14, we therefore limit our sample restriction to require only that individuals had lived in Sweden between 2019 and 2021, including anyone who later emigrates. This change produces results that are very similar to our main specification.

Placebo test. We next use drugs for non-mental health related conditions as a placebo test. Figure A.9 shows that there are no effects for conditions that are unlikely to be affected by the invasion using drugs for cardiovascular and other chronic conditions.[19] This lends additional credibility to the identification strategy by showing that Ukrainians are not trending towards worse health or greater contact with the health care system for other reasons than mental health.

Synthetic difference-in-differences. As an alternative estimation strategy, we estimate a Synthetic Difference in Differences (SDID) event study following Arkhangelsky et al. (2021). The SDID method combines the strengths of standard difference in differences and synthetic control estimators by optimally weighting both units and time periods to match pre-treatment outcome dynamics between treated and control groups, thereby relaxing the parallel trends assumption. In addition, it provides an alternative inference method based on random permutation of the treatment assignment, which allows us to compare results with our main specification. The SDID event-study results are presented graphically in Figure A.12, while year-by-year estimates are shown in Table A.21. Results are very similar to our main estimates both in terms of magnitudes and temporal pattern.

5 External validity: Evidence from Europe and the United States

To assess whether the labor market patterns documented in Sweden generalize to other settings, we use data from the American Community Survey (ACS) for the years 2018–2024 and apply similar sample restrictions as in our main sample.[20] We then estimate event-study specifications analogous to Equation 1, regressing labor market outcomes on interactions between a Ukrainian-origin indicator and year dummies, with origin country and state-by-year fixed effects. Standard errors are clustered at the origin country level.

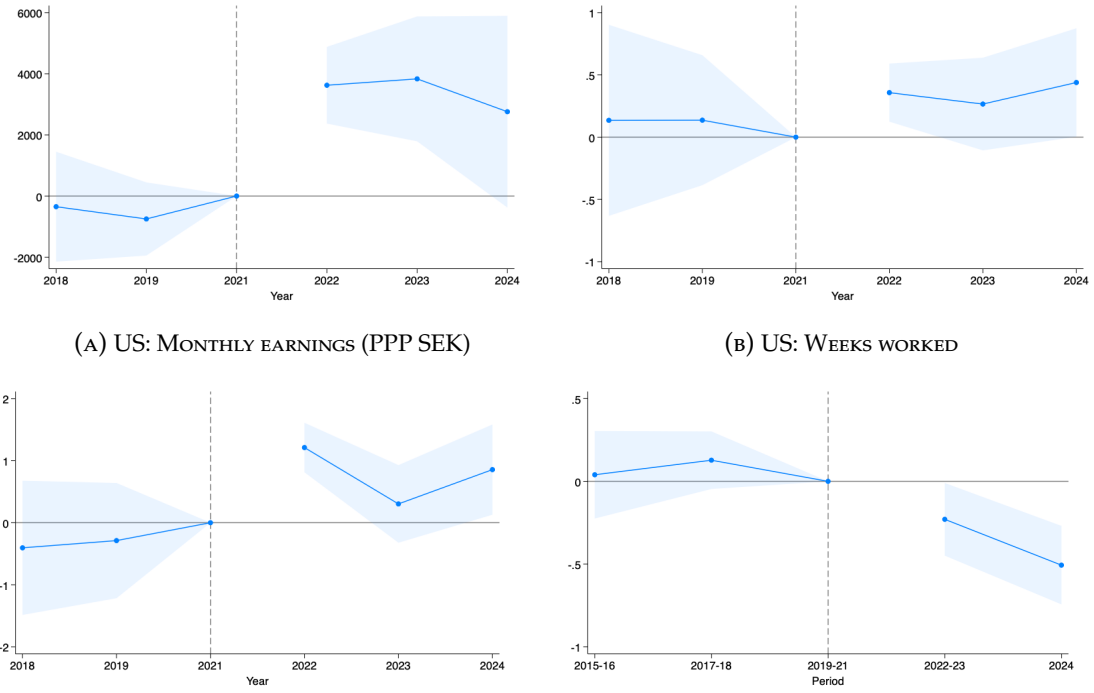
Figure 4 displays the event-study results for three labor market outcomes. Panel A shows that Ukrainian expatriates in the United States experience a large and significant increase in annual earnings after the invasion, on the order of 3,000–4,000 SEK per month in PPP terms. Panel B shows weeks worked per year, which increase modestly but imprecisely. Panel C shows the probability of

[19] Table A.15 displays corresponding estimates at the yearly level.

[20] Full details are provided in Section B.1. We restrict the sample to foreign-born non-citizens and naturalized citizens who immigrated before 2019 and were of working age (14–64) in 2020. To avoid capturing spillover effects, we exclude migrants from Russia and countries sharing a border with Ukraine or Russia. The 2020 survey year is excluded due to data collection disruptions caused by the Covid-19 pandemic.

working 40 or more hours per week, which increases by approximately 1 percentage point in 2022 and 2024. Across outcomes, the pre-trends are reassuringly flat, with no evidence of diverging trajectories prior to the invasion.[21]

FIGURE 4: EXTERNAL VALIDITY: EVENT-STUDY ESTIMATES



(A) US: MONTHLY EARNINGS (PPP SEK)

(B) US: WEEKS WORKED

(C) US: WORKED 40+ HOURS/WEEK

(D) EUROPE: WELL-BEING INDEX

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine. Panels A–C show labor market outcomes among Ukrainian migrants in the United States, using data from the American Community Survey 2018–2024 (excluding 2020). The sample consists of foreign-born individuals who immigrated before 2019. Panel A shows monthly earnings in 2024 PPP SEK (100 SEK ≈ $11). Panel B shows weeks worked per year (using interval midpoints for 2018, exact values thereafter). Panel C shows the probability of usually working 40 or more hours per week (range: 0–100%). The base year is 2021. All specifications include country-of-origin and state-by-year fixed effects. Panel D shows the Anderson well-being index using Ukrainian migrants in the European Social Survey (range: 0–100%). The specification includes country-of-origin and year fixed effects. Full details in Section B.2 The vertical dashed line indicates the base year (2021 or 2019–2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

The ACS does not contain information on mental health or subjective well-being. To assess whether the mental health effects documented in Sweden are present in other countries, we use data from the European Social Survey (ESS).[22] Using an event-study specification that controls for

[21] Table B.1 presents the corresponding yearly difference-in-differences estimates. Since the ACS is a repeated cross-section, the sample composition may change over time. Table B.2 shows that there are no significant differences in age, citizenship or age since migration after the invasion, although there are small increases in share female and college educated. Table B.3 shows that the earnings results are robust to the inclusion of individual-level covariates and to restricting the sample to a balanced set of origin countries.

[22] Full details are provided in Section B.2. Due to small sample sizes, we pool ESS rounds into five groups. We restrict

country of origin and year dummies, Panel D of Figure 4 shows effects on the Anderson well-being index, which is the mean of four standardized variables: happiness, life satisfaction, satisfaction with health, and self-reported health status. The result indicate a significant reduction in the well-being index.

These results are strikingly consistent with our Swedish findings, indicating that Ukrainians across multiple countries in the world are similarly affected by Russia's full-scale invasion. Moreover, they provide direct evidence on outcomes that are not available in Swedish register data: increased hours of work and self-reported mental health and well-being.

6 Mechanisms

6.1 Exposure to conflict

Our conceptual framework indicates that individuals whose family are more exposed to the war will have a greater response on the financial provision channel, raising their labor supply. To test for this possibility, we use data on Ukrainians' region (oblast) of origin, based on data from residency permit-applications that record birth towns. With these data, we are able to match 90% of Ukrainians from their town of birth to an oblast. We then employ ACLED (Raleigh et al., 2023) to compute war-related fatalities by oblast as a measure of direct exposure of close ones to danger and displacement due to the war.

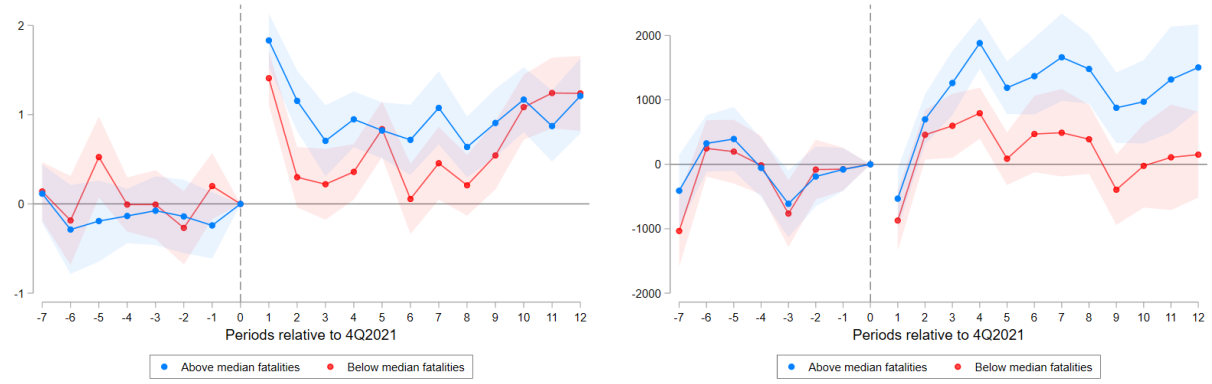
Our main analysis studies conflict fatalities occurring in the first quarter of 2022. This captures the regional spread of conflict at the earliest stage of the invasion and reflects the most exogenous shock to the regional conflict intensity. It also accurately predicts long-term fatalities, however, as the conflict is highly spatially concentrated. Figure A.13 shows that oblasts with more fatalities by March of 2022 have more later fatalities, whether measured in 2022 or 2022–2024. By contrast, oblasts with below-median early fatalities have close to zero fatalities by 2024. Figure A.14 displays a map of early conflict events in Panel A, while Panel B shows that these areas largely coincide with Russian territorial advances. The distribution is highly skewed towards eastern oblasts bordering Russia, Belarus, and the Black Sea.

The stark regional difference in conflict fatalities entails that the direct war-exposure of expatriates' close ones varies substantially by region of origin.[23] Figure 5 displays event study plots separated by degree of war exposure. Estimates in blue are from regressions that keep only Ukrainians from oblasts with above-median fatalities in 2022Q1, with estimates in red show results when keeping Ukrainians from oblasts with below-median fatalities. Panel A indicates that both groups experience significant increases in mental health prescriptions at the onset of the invasion. More exposed oblasts display generally larger effects during 2022 and 2023, with effects converging

the sample to host countries where Ukrainian migrants are observed in both the pre- and post-invasion periods, and require a minimum of three observations per group in each country-period cell. These restrictions yield a sample of approximately 830 migrants, of whom 186 are Ukrainian.

[23] This assumes that Ukrainian expatriates are have more close ties to individuals living in their oblast of birth than in other regions, on average.

FIGURE 5: EFFECTS BY EXPOSURE TO WAR FATALITIES



(A) ANY DRUG (B) EARNINGS

Notes: This figure shows event-study estimates of heterogeneous treatment effects by exposure to war fatalities in the home region (oblast). The Ukrainian sample is restricted to those for whom we can match birth town to the oblast of origin using residency permit application data. Blue lines show Ukrainians originating from oblasts with above-median war fatalities in the first quarter of 2022 (corresponding to 20 or more deaths). Red lines show Ukrainians from oblasts with below-median fatalities. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). The control group consists of matched migrants from other countries. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

in 2024. By contrast, Panel B indicates that the increase in earnings is primarily driven by the most war-exposed oblasts. Table 4 shows results from a triple-difference regression. The estimates in columns 1 and 3 indicate that individuals from more war-exposed oblasts have significantly higher drug prescriptions and earnings in 2022 compared to low-exposure oblasts. The within-Ukraine difference in prescriptions decreases and becomes insignificant in later years, while the difference in earnings is significant in all years and increasing over time. Individuals from low-exposure oblasts display no significant increase in earnings. Indeed, earnings estimates for high-fatality oblasts are close to the baseline earnings estimate in Column 5 of Table 2. In Tables A.22 and A.23, we show that these results do not depend on functional form assumptions, as results are robust to specifying fatalities in logs, nor the choice of period, as the pattern is similar when using fatalities for all of 2022–2024.

One worry with the analysis above is that individuals from high-fatality oblasts may differ from other Ukrainians in a ways that may explain the divergent outcomes. To investigate this, we perform balance tests to see of war exposure predicts pre-war characteristics among Ukrainians. Table A.24 shows that the majority of individual correlations are insignificant, as is the F-test of joint significance. Individuals from high-exposure oblasts are significantly more likely to be Swedish citizens and, correspondingly, to have been in Sweden for longer. To investigate the potential confounding effect of these characteristics, columns 2 and 4 of Table 4 provide "horse-

race" regressions that include interactions between a Ukraine dummy, each post-war year, and indicators for Swedish citizenship and above-median years in Sweden. Reassuringly, the inclusion of these factors do not affect our conclusions. In fact, column 4 finds larger earnings responses when taking into account residency status.

These results indicate that the war led to relatively general mental health effects for Ukrainians regardless of regional origin, consistent with a collective trauma. Moreover, results for earnings are in line with the predictions of our model, in which labor supply responds especially when families have greater direct exposure to the war. In Section 6.4 below, we test for the possibility that greater war exposure affects return intentions, finding that it is unlikely to explain all of our results.

6.2 Refugee reception

Next, we ask to what extent exposure to Ukrainian refugees affects mental health and labor market outcomes. To do so, we study the geographical distribution of refugee arrivals in Sweden. Upwards of 50,000 Ukrainians arrived in Sweden in a short period of time after the onset of the war, with the majority arriving in the first half of 2022.[24] As a proxy for refugee exposure among our population of interest, we divide the number of refugee arrivals by the number of Ukrainians already living in the municipality in 2021. The results in column 1 of Table 5 show that mental health prescriptions are significantly lower when the relative share of Ukrainian refugees is higher. For earnings, in column 3, we observe a positive effect during 2022, which then dissipates.

A large share of Ukrainian refugees were assigned to host municipalities by the Swedish Migration Agency, based on predefined quotas rather than refugees' own preferences.[25] Columns 2 and 4 of Table 5 show that estimates using only assigned refugees are very similar to our baseline results. One remaining concern is that refugee arrivals may be correlated with unobserved municipal characteristics that also affect our outcomes. To address this, in Table A.25, we include municipality-by-quarter fixed effects, which absorb time-varying local factors such as health-care access and labor-market conditions. This specification yields similar results.

These findings indicate that greater exposure to conational refugees alleviate the mental health burden, possibly through greater contact leading to less isolation and providing comfort.

6.3 Return intentions

Recent work has shown that conflict in home regions may influence migrants' return intentions and cause them to input greater effort to integrate in the host country (Aksoy et al., 2024; Bassetto and Freitas Monteiro, 2024). While we do not directly observe return intentions, we examine their influence by focusing on a subset of migrants whose return intentions are least likely to be affected

[24] Ukrainian refugees were initially not given Swedish ID numbers, meaning that it is not possible to identify family links or see who co-habits. Ukrainian refugees were not able to be registered in the population register and receive an ID number until June 2024.

[25] Quotas are set based on factors such as local unemployment levels and previous refugee reception.

by home-country shocks: individuals whose return intentions are already low. As a proxy, we focus on individuals who are Swedish citizens, are married to a Swedish spouse, and who have above-median length of residence in Sweden (at least 9 years). Table A.26 shows that emigration in this is very similar between Ukrainians and control migrants after the invasion.[26]

If changed return intentions is the main operating mechanism, we should not observe any effects among individuals with low return intentions. In contrast, column 1 of Table A.27 finds that there are no statistically significant differences in earnings with respect to return intentions. It is also possible that return intentions are particularly affected if migrants' birth oblast is more exposed to the war (Adema et al., 2024). Column 2 Table A.27 therefore interacts our proxy for low return intentions with an indicator for high war fatalities. Results indicate that earnings increase more in both groups.

Taken together, our results that earnings responses occur even among Ukrainian expatriates who have low return intentions ex ante. This is true even if they originate from areas with higher conflict intensity. Therefore, shifting return intentions are unlikely to drive our earnings results, which are better explained by increase labor supply due to direct exposure of close ones to the conflict.

6.4 Alternative mechanisms

In this section we discuss and explore two alternative explanations to our results.

First, it is possible that stigma around applying for health care was reduced after the start of the war. In this case the effects would mainly be driven by individuals who already had mental health issues, but had avoided going to the doctor due to stigma. By contrast, we would expect no effect among individuals who have previously used mental health drugs, as they have already broken through the stigma cost. We can identify the second group, but not the first one, and in Figure A.4 we find that they display a large spike in prescriptions in the beginning of the invasion. The effect is considerably larger than the baseline effect, 2.5 instead of 1.6 percentage points. The effects size in the following quarters is close to zero, but increases again by the end of our study period. Given that this group still reacts immediately after the invasion and again towards the end of the sample period, the effect is unlikely to be related to stigma. In addition, the fact that individuals start using immediate-use drugs, rather than antidepressants—as seen in Figure 1—is also consistent with seeking treatment for new, rather than long term, issues.

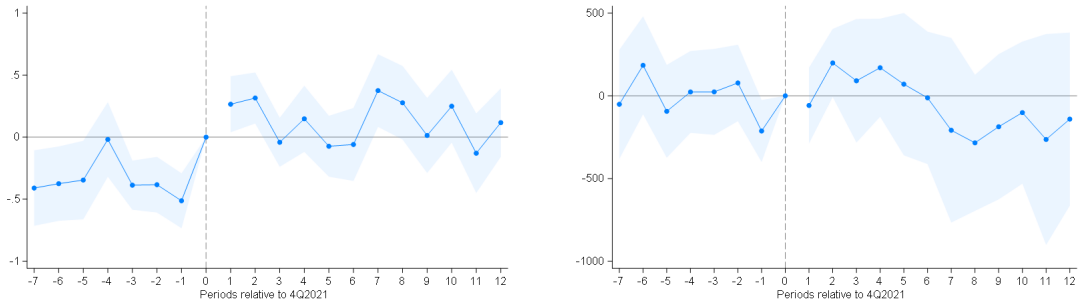
Second, it is possible that Ukrainians in Sweden were positively discriminated in the labor market after the invasion if employers wanted to specifically help this group. In this case, the effects we observe are driven by changes in labor demand rather than supply. To test for this, we note that a positive labor demand shock for Ukrainians would affect only those who are in the labor force, while while not affecting those who were not actively looking for jobs prior to the invasion. Using data from the Public Employment Service, we identify individuals who are

[26] By contrast, in the non-low return group, Ukrainians display a clear drop in emigration after the invasion compared to controls.

registered as job seekers in November 2021. We contrast their outcomes to those of individuals who are not in the labor force, defined as having no earnings in Q4 of 2021. Table A.10 shows that the earnings and employment effects are positive for individuals who were already working, actively looking for a job, and those not in the labor force, although the estimates are larger for the two last groups. Moreover, Table A.28 restricts the sample to unemployed individuals and those not in the labor force and shows that there are no statistically significant differences between them in terms of earnings or employment. The fact that we can see that all three groups increase their labor supply suggests that they are not reacting due to a sudden decrease in discrimination.

Additionally, the fact that the effects vary with the conflict intensity in individuals home regions is inconsistent with effects being driven by changes in physicians treatment, removal of stigma, or decreased discrimination.

FIGURE 6: OUTCOMES FOR RUSSIANS



(A) ANY MENTAL HEALTH PRESCRIPTION (B) MONTHLY EARNINGS (SEK)

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on outcomes among Russian migrants in Sweden. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). The sample includes Russian migrants and matched control migrants from other countries, constructed using the same matching procedure as the main analysis. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

7 Effects on Russian expatriates

For Russians living abroad, the prospects of seeing their family or returning home changed drastically following the invasion. Men were faced with the increased likelihood of having to join the army if they returned, while male friends and family living in Russia could be enlisted.[27] In addition, relatives could no longer obtain visas after the European Union decided to fully suspend its visa facilitation agreement with Russia in September 2022. During the last years, the number

[27] The maximum age for conscription in Russia increased from 27 to 30 years in July 2023. One year later, the age limit for individuals who had already completed their compulsory service increased by five years, now reaching the age of 40, 50 or 55, depending on the category.

of Ukrainian attacks on Russian territory has also increased.

In 2022 there were about 20,000 Russians living in Sweden. We apply the same sample restrictions and create a matched sample using the same procedure as for Ukrainians, described in Section 3. Figure 6 plots the outcomes for mental health and labor income. We find an increase in the use of mental health prescriptions in the first quarters following the invasion. Table A.29 shows yearly aggregate affects, indicating that the effect is smaller in absolute and relative size compared to the estimates for the Ukrainians. The effect is also persistent over time. However, we observe no effect on earnings. This is consistent with Russians also being subject to mental stress, but with less direct exposure of family to the

8 Conclusion

This paper shows that war affects not only those who flee or remain in conflict zones, but also expatriates who live abroad. Studying Ukrainian migrants in Sweden during Russia's 2022 invasion of Ukraine, we document a persistent uptake in mental health prescriptions alongside increases in employment and earnings. The coexistence of worsening mental health and rising labor supply highlights an important and previously understudied margin of adjustment to conflict under indirect exposure.

The pattern of results is consistent with two interacting channels. Concern for the safety of family and friends increases psychological distress, while heightened financial responsibilities raise labor supply and contributes to acceptance of lower-quality jobs. Together, these forces help explain why labor-market engagement increases even as mental health deteriorates.

Because our analysis relies on prescription data, we capture only treated cases of mental health distress. As a result, our estimates likely understate the full psychological burden of the invasion. Appendix D.1 translates prescription-linked outcomes into quality-adjusted life years and shows that even treated cases alone imply economically meaningful welfare losses.

More broadly, the findings underscore that the economic and welfare consequences of war extend beyond national borders and directly exposed populations. In a globalized world with large migrant diasporas and increasingly frequent conflicts, indirect exposure represents a quantitatively important channel through which violent events shape migrants' well-being and economic behavior.

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Table 1: Descriptive statistics: Ukrainian and Matched Comparison Migrants

	Rest of Countries			Ukraine			
	n	mean	sd	n	mean	sd	Diff
Female	17348	0.67	0.47	8771	0.67	0.47	-0.000
Age	17348	38.19	12.26	8771	37.65	11.36	-0.541
Married with Swedish	17348	0.13	0.33	8771	0.12	0.32	-0.012
Married with other	17348	0.21	0.41	8771	0.21	0.41	-0.001
Had children	17348	0.56	0.50	8771	0.56	0.50	0.001
Years in Sweden	17348	9.83	8.46	8771	9.50	7.18	-0.329
Had Swedish citizenship	17348	0.54	0.50	8771	0.55	0.50	0.009
Had relative visa	17348	0.23	0.42	8771	0.23	0.42	-0.004
Had work visa	17348	0.13	0.34	8771	0.12	0.33	-0.009
Had student visa	17348	0.01	0.10	8771	0.01	0.11	0.003
Refugee	17348	0.02	0.14	8771	0.02	0.14	0.000
No university education	17348	0.24	0.43	8771	0.24	0.42	-0.005
Mean annual family income (2020-21)	17348	4865.29	16149.84	8771	4811.81	5579.14	-53.483
Mean annual wage income (2020-21)	17348	2538.44	2992.44	8771	2578.28	2336.17	39.842

Notes: This table presents descriptive statistics for the matched sample used in the main analysis. The sample includes Ukrainian migrants (treatment group) and matched control migrants from countries other than Russia and European countries bordering Ukraine or Russia. Matching was performed using exact matching on county of residence and gender, combined with nearest-neighbor propensity score matching (caliper = 0.01) on 2020 characteristics: age, presence of children, marital status, visa type, Swedish citizenship, years in Sweden, university education, and mean annual family and individual income for 2020–2021 (nominal; in 100 SEKs). The last column reports the difference in means between Ukrainian and control migrants. ** $p<0.1$, ** $p<0.05$, *** $p<0.01$.*

Table 2: Mental health and labor market outcomes: Yearly estimates

	Any drug	Immediate relief drug	Anti depressant	Earnings	Employment
	(1)	(2)	(3)	(4)	(5)
Ukraine × 2022	1.00***	0.78***	0.41***	749.54***	1.90***
	(0.10)	(0.08)	(0.08)	(173.99)	(0.60)
Ukraine × 2023	0.71***	0.26***	0.66***	984.83***	2.26***
	(0.11)	(0.09)	(0.09)	(266.61)	(0.81)
Ukraine × 2024	1.07***	0.31***	1.12***	813.51***	1.22
	(0.14)	(0.09)	(0.12)	(304.91)	(1.08)
Observations	522380	522380	522380	522380	522380
Individuals (Ukraine)	8771	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348	17348
Mean (Ukraine)	5.60	3.13	3.49	26611	69.23
Mean (Control)	5.95	2.86	4.17	25829	64.13

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on mental health and labor market outcomes among Ukrainian migrants in Sweden. Column 1 shows the probability of filling at least one prescription for any mental health medication per quarter. Column 2 shows prescriptions for anti-anxiety or insomnia medications (immediate relief). Column 3 shows prescriptions for anti-depressants. Column 4 shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). Column 5 shows employment, measured as the share of months with positive earnings within each quarter (range: 0–100%). Mean values are measured during the pre-period. The sample includes Ukrainian migrants and matched control migrants. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE 3: JOB QUALITY EFFECTS BY PRIMARY AND SECONDARY JOB

	Mean firm earnings (1)	Earnings (2)	Earnings Residual (3)	Rank (Earnings | firm-edu) (4)	Same sector (5)
Panel A: First job					
Ukraine × 2022	-291.71	-232.90	-288.42*	-0.85***	
	(264.88)	(182.99)	(159.51)	(0.18)	
Ukraine × 2023	39.15	8.10	-170.45	-1.43***	
	(201.94)	(245.08)	(209.96)	(0.26)	
Observations	287387	287387	287387	287387	
Individuals (Ukraine)	7840	7840	7840	7840	
Individuals (Control)	14863	14863	14863	14863	
Mean (Ukraine)	39401	38184	-3178	59.13	
Mean (Control)	40265	40608	-0	58.29	
Panel B: Second job					
Ukraine × 2022	-899.70***	-695.47**	-488.45*	-1.74***	-0.18
	(278.33)	(275.95)	(261.51)	(0.50)	(0.80)
Ukraine × 2023	-573.44*	-633.28**	-463.03	-2.28***	-0.78
	(325.58)	(299.01)	(280.94)	(0.59)	(0.90)
Observations	41044	41044	41044	41044	41040
Individuals (Ukraine)	3707	3707	3707	3707	3707
Individuals (Control)	6548	6548	6548	6548	6547
Mean (Ukraine)	27386	11842	-560	44.55	14.75
Mean (Control)	27419	12438	0	41.21	16.33

Notes: This table shows the effect of the 2022 Russian invasion of Ukraine on job quality measures for first and second jobs (defined by share of earnings) among Ukrainian migrants in Sweden. Panel A examines the primary (first) job. Panel B examines the secondary (second) job. Column 1 shows mean firm earnings, defined as the leave-one-out average earnings of all workers at the individual's workplace. Column 2 shows the individual's own earnings. Column 3 shows earnings residuals from a Mincer regression controlling for age, education, and years in Sweden. Column 4 shows the individual's earnings rank within their workplace, controlling for education level (percentile ranks). Earnings are measured in 2024 SEK value (100 SEK ≈ $11). All models control for country and quarter fixed effects. The sample includes Ukrainian migrants and matched control migrants employed in a given quarter. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

TABLE 4: EFFECTS BY ABOVE-BELOW MEDIAN EXPOSURE TO WAR FATALITIES

	Any drug		Earnings	
	(1)	(2)	(3)	(4)
Ukraine × 2022	0.522*	0.477	377.808	339.550
	(1.82)	(1.50)	(1.42)	(1.00)
Ukraine × 2023	0.340	0.652**	472.554	796.749
	(1.18)	(2.05)	(1.23)	(1.44)
Ukraine × 2024	0.978***	1.267***	109.617	449.749
	(3.40)	(3.53)	(0.25)	(0.75)
Ukraine × Above median fatalities 2022Q1 × 2022	0.758**	0.761**	566.926**	801.550***
	(2.31)	(2.30)	(2.40)	(3.25)
Ukraine × Above median fatalities 2022Q1 × 2023	0.593	0.652	839.736***	1254.742***
	(1.44)	(1.52)	(2.77)	(3.42)
Ukraine × Above median fatalities 2022Q1 × 2024	0.181	0.238	1070.714***	1511.298***
	(0.52)	(0.68)	(3.11)	(3.61)
Horse-race interactions	No	Yes	No	Yes
Observations	501500	501500	501500	501500
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean	5.83	5.83	26092	26092
Mean (Ukraine)	5.60	5.60	26611	26611
Mean (Control)	5.95	5.95	25829	25829

Notes: This table shows triple difference-in-differences estimates depending on exposure to conflict fatalities in the home region. Ukrainian migrants are classified based on their oblast of origin using birth town data from residency permit applications. *Above median fatalities 2022Q1* takes the value one if a Ukrainian originates from an oblast that experienced above-median number of war fatalities during the first quarter of 2022 (corresponding to 20 or more deaths), and zero otherwise. *Any drug* is an indicator for filling at least one prescription for a mental health medication in a quarter. *Earnings* denotes average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). *Horse-race interactions* indicate inclusion of the triple interaction between *Ukraine*, post-invasion year dummies, and indicators for being Swedish citizen and for having above-median years in Sweden. Standard errors are clustered by country of origin for non-Ukrainian origins, and by birth oblast for Ukrainians. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 5: Effects by refugee reception

	Any drug		Earnings	
	(1)	(2)	(3)	(4)
Ukraine × 2022	0.983***	0.996***	747.750***	753.795***
	(0.082)	(0.085)	(180.497)	(180.278)
Ukraine × 2023	0.693***	0.710***	987.723***	996.192***
	(0.067)	(0.063)	(253.379)	(258.701)
Ukraine × 2024	1.063***	1.064***	822.327***	835.542***
	(0.074)	(0.084)	(311.048)	(315.494)
Ukraine × 2022 × Refugees	-0.260***		182.553*	
	(0.050)		(100.452)	
Ukraine × 2023 × Refugees	-0.304**		45.636	
	(0.134)		(127.357)	
Ukraine × 2024 × Refugees	-0.266**		0.824	
	(0.125)		(173.971)	
Ukraine × 2022 × Assigned refugees		-0.273***		250.057**
		(0.080)		(118.542)
Ukraine × 2023 × Assigned refugees		-0.305**		93.850
		(0.144)		(125.217)
Ukraine × 2024 × Assigned refugees		-0.446***		70.113
		(0.148)		(174.894)
Observations	520940	521900	520940	521900
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean (Ukraine)	5.60	5.60	26611.03	26611.03
Mean (Control)	5.95	5.95	25829.25	25829.25

Notes: This table shows heterogeneous treatment effects depending on the reception of Ukrainian refugees in the individual's municipality in 2022. *Refugees* is measured as the number of Ukrainian refugees hosted by the municipality in 2022 relative to the number of Ukrainians already living in the municipality in 2021. Columns 1 and 3 use all refugees arriving in the municipality. Columns 2 and 4 use only refugees who were centrally assigned by the Swedish Migration Agency based on housing availability. Columns 1–2 show the probability of filling at least one prescription for any mental health medication. Columns 3–4 show average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). All models control for individual and quarter fixed effects. The sample includes Ukrainian migrants and matched control migrants. Standard errors are clustered by country of origin and municipality. *$p<0.1$, **$p<0.05$, ***$p<0.01$.

Online Appendix
Beyond the Battlefield: War's Impact on Expatriates' Health and Livelihoods

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A.1 Figures

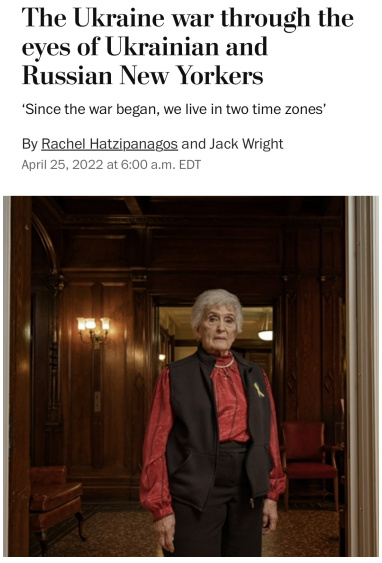
FIGURE A.1: NEWSPAPER ARTICLES ON THE REACTIONS OF UKRAINIANS LIVING ABROAD



(A) NBC NEWS, FEBRUARY 28TH 2022

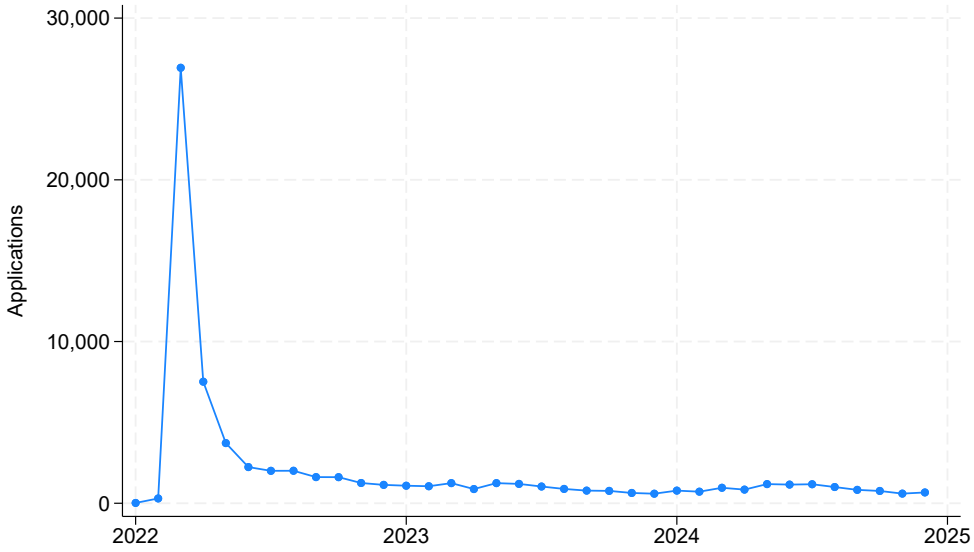


(B) CBC NEWS, FEBRUARY 24TH 2022



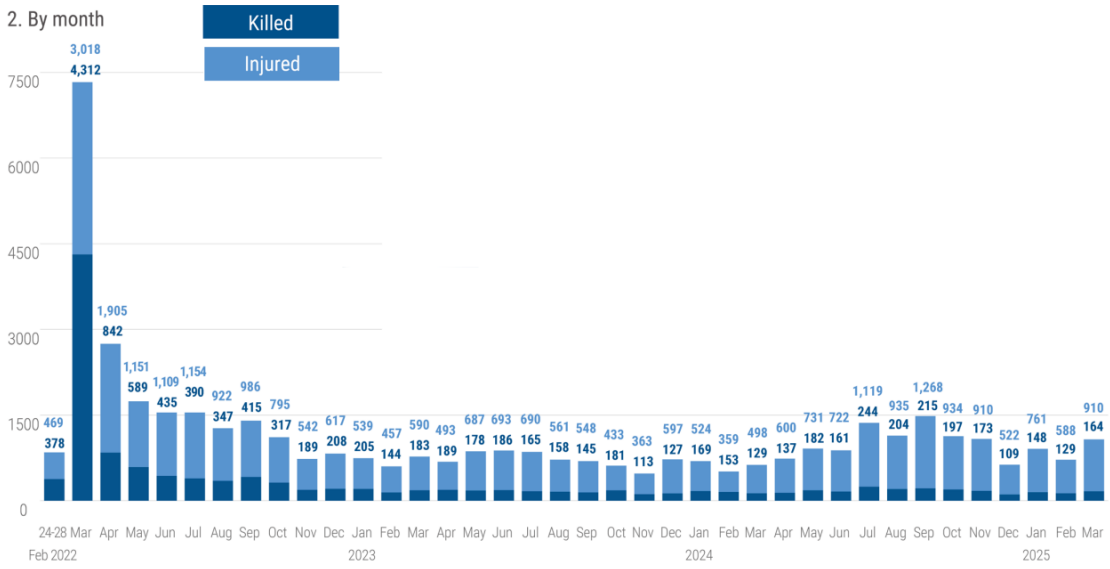
(C) THE WASHINGTON POST, APRIL 25TH 2022

FIGURE A.2: APPLICATIONS UNDER THE TEMPORARY PROTECTION DIRECTIVE, SWEDEN



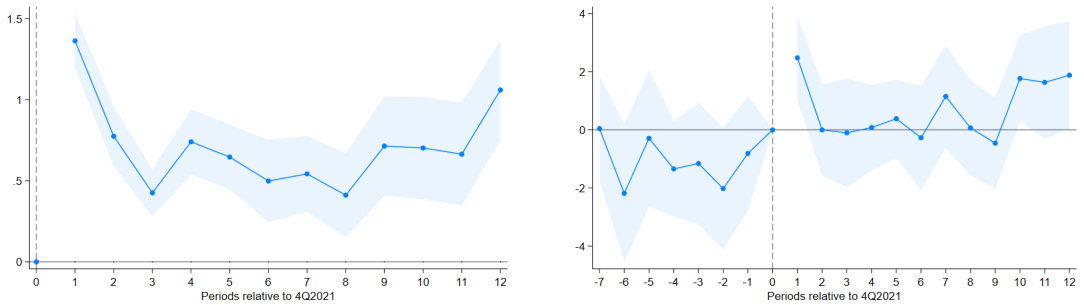
Notes: This figure shows monthly applications for asylum in Sweden under the European Union's Temporary Protection Directive, which was activated for the first time in March 2022 to provide immediate protection to individuals fleeing Ukraine. The directive grants temporary residence permits without requiring a full asylum process. The large spike in applications occurred in the immediate aftermath of the invasion, with the majority arriving between March and June 2022. Source: Swedish Migration Agency.

FIGURE A.3: UKRAINIAN CIVILIAN CASUALTIES



Notes: This figure shows monthly Ukrainian civilian casualties (killed and injured) from the start of the Russian invasion in February 2022 through February 2025. Individual cases are verified by the Office of the United Nations High Commissioner for Human Rights (OHCHR). Actual numbers are likely higher due to delays in verification and ongoing difficulties in documenting casualties in active conflict zones. Source: OHCHR, HRMMU.

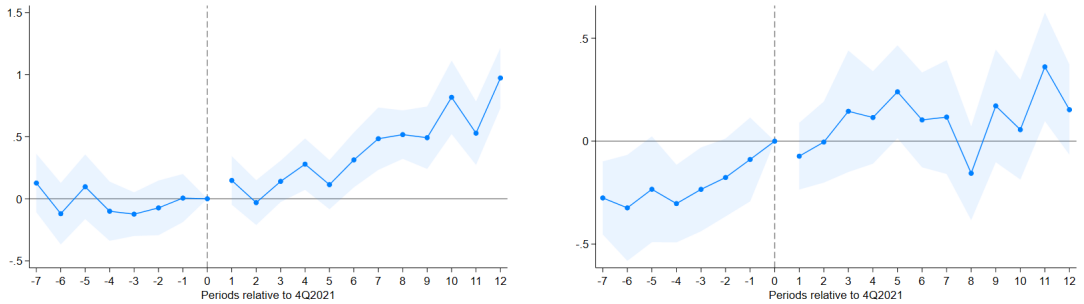
FIGURE A.4: EXTENSIVE AND INTENSIVE MARGIN RESPONSES IN MENTAL HEALTH



(A) EXTENSIVE MARGIN (B) INTENSIVE MARGIN

Notes: This figure decomposes the mental health effects by prior treatment status. Panel A shows the extensive margin, restricting the sample to individuals who did not fill any prescriptions for mental health medications during 2018–2021. This captures new users initiating treatment after the invasion. Panel B shows the intensive margin, restricting the sample to individuals who filled at least one mental health prescription during 2018–2021. This captures changes in treatment among those with prior mental health issues. By construction, there are no differences in outcomes in the pre-period for Panel A. Both panels show the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

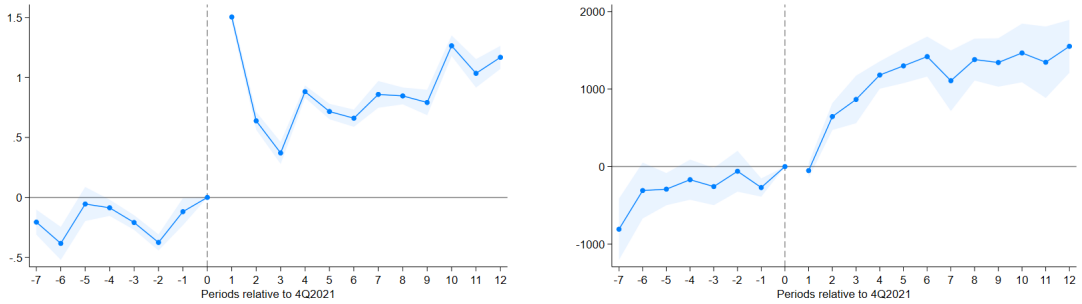
FIGURE A.5: ANTI-DEPRESSANTS BY PREVIOUS USAGE OF IMMEDIATE DRUGS



(A) ANTI-DEPRESSANTS, PREVIOUSLY ON IMMEDIATE DRUGS (B) ANTI-DEPRESSANTS, PREVIOUSLY NOT ON IMMEDIATE DRUGS

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on the likelihood of filling a prescription for anti-depressants in a given quarter, conditional on having previously picked up an immediate-relief drug (Panel A) or not (Panel B). The sample includes Ukrainian migrants and matched control migrants. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

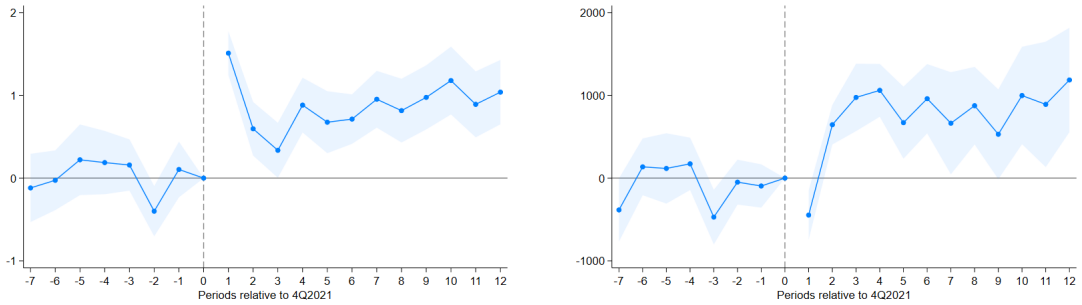
FIGURE A.6: UNMATCHED SAMPLE



(A) ANY MENTAL HEALTH PRESCRIPTION (B) MONTHLY EARNINGS (SEK)

Notes: This figure shows event-study estimates using the full, unmatched sample as a robustness check. The sample includes all Ukrainian migrants and all other migrants (excluding those from Russia and European countries bordering Ukraine or Russia) aged 14–64 in 2020, who resided in Sweden continuously from 2019–2024. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

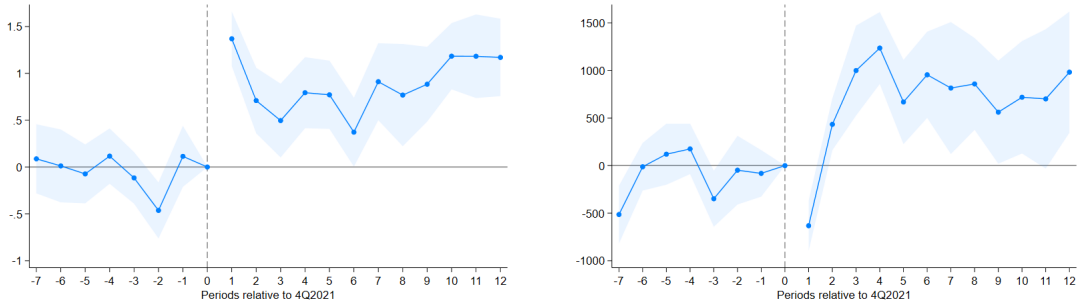
FIGURE A.7: MATCHED SAMPLE USING ADJACENT-COUNTRY MIGRANTS



(A) ANY MENTAL HEALTH PRESCRIPTION (B) MONTHLY EARNINGS (SEK)

Notes: This figure shows event-study estimates using a matched sample that includes migrants from European countries adjacent to the conflict (Poland, Baltic states, and other countries bordering Ukraine or Russia) in the control group. The main analysis excludes these countries to avoid capturing spillover effects. The matching procedure is identical to the main analysis. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

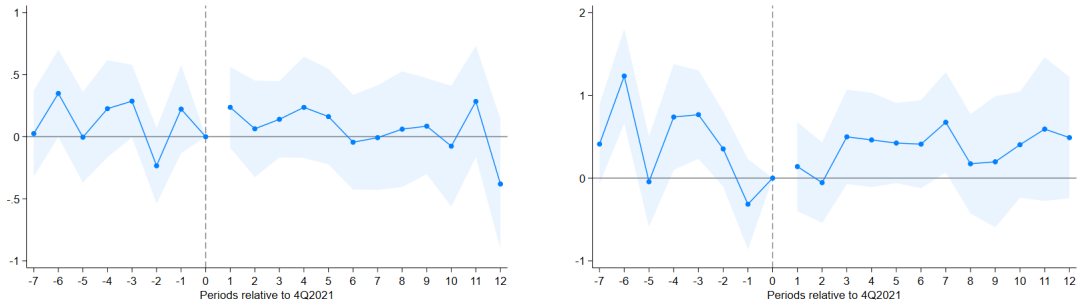
FIGURE A.8: INCLUDING OUT-MIGRANTS



(A) ANY MENTAL HEALTH PRESCRIPTION (B) MONTHLY EARNINGS (SEK)

Notes: This figure shows event-study estimates using an unbalanced panel that includes individuals who emigrate from Sweden after the invasion. The main analysis restricts the sample to individuals who remain in Sweden through 2024. This robustness check requires only that individuals resided in Sweden continuously from 2019–2021, allowing them to emigrate at any point after the invasion. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows average monthly earnings per quarter, measured in 2024 SEK value (100 SEK ≈ $11). The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

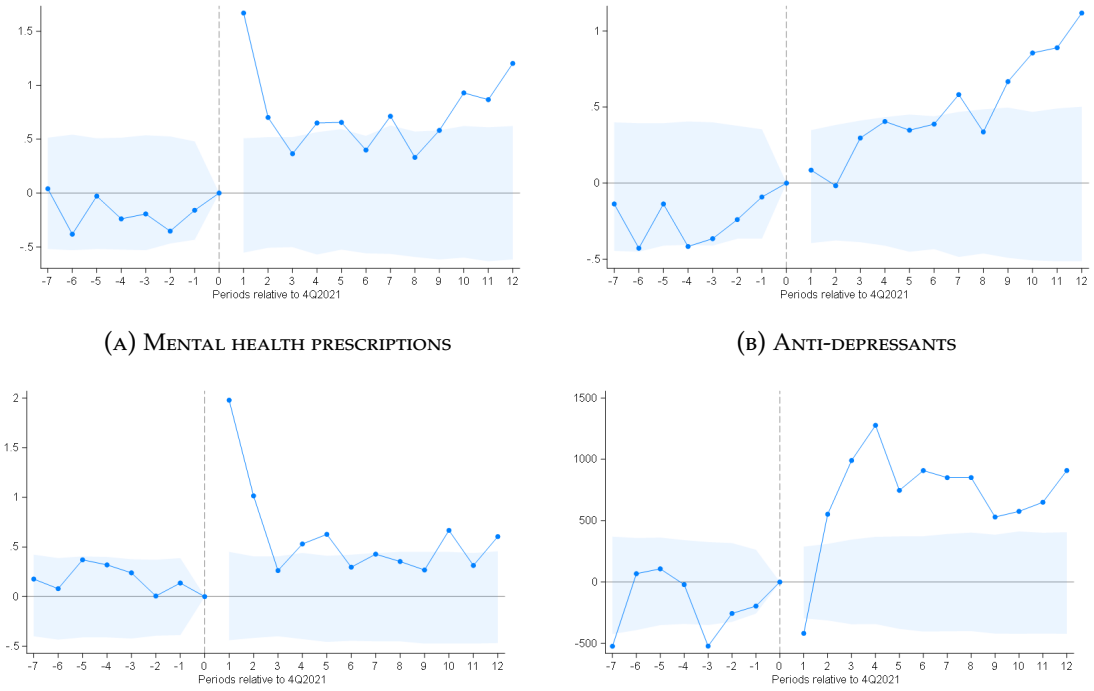
FIGURE A.9: OTHER DRUGS



(A) CARDIOVASCULAR PRESCRIPTIONS (B) OTHER CHRONIC CONDITION DRUGS

Notes: This figure shows placebo tests using prescriptions for medications unrelated to mental health. If Ukrainians were generally seeking more healthcare or experiencing deteriorating health across multiple dimensions, we would expect to see increases in these medications as well. Panel A shows prescriptions for cardiovascular medications (ATC codes C01–C10). Panel B shows prescriptions for other chronic conditions including diabetes, respiratory conditions, and musculoskeletal disorders. Both outcomes measure the probability of filling at least one prescription per quarter, in percentage points. The sample includes Ukrainian migrants and matched control migrants. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

FIGURE A.10: PERMUTATION INFERENCE USING THE MATCHED SAMPLE



(A) MENTAL HEALTH PRESCRIPTIONS

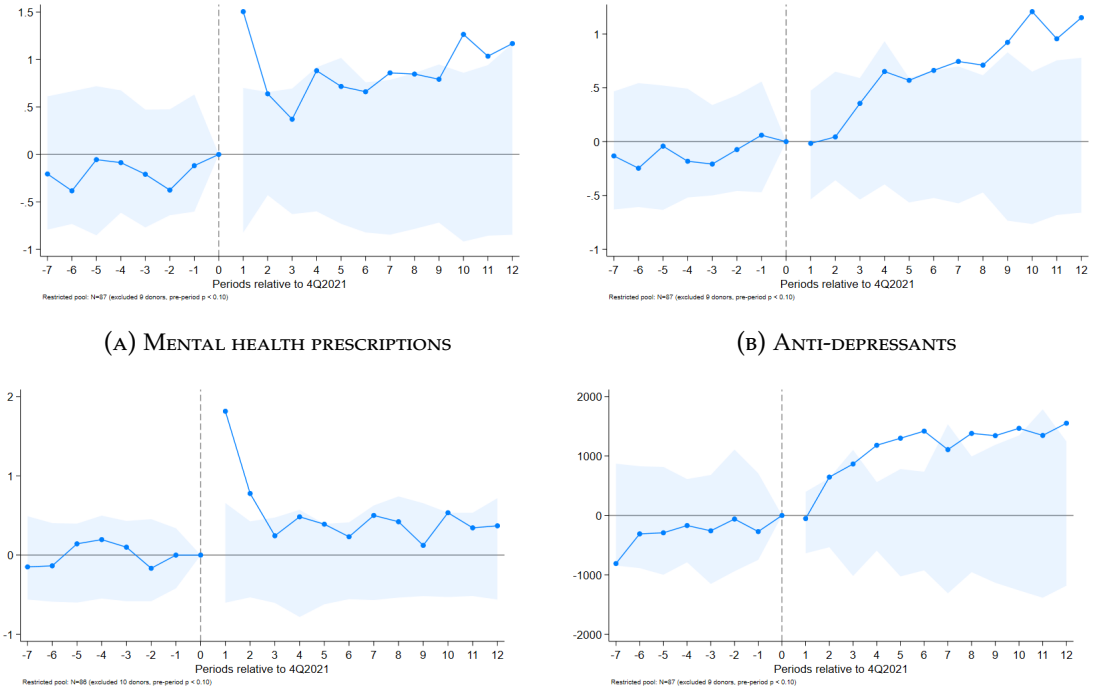
(B) ANTI-DEPRESSANTS

(C) ANTI-ANXIETY/INSOMNIA

(D) MONTHLY EARNINGS

Notes: This figure shows event-study estimates using matched-triplet permutation inference as an alternative inference procedure to the cluster-robust standard errors reported in the main analysis. Following Rosenbaum (2002), we exploit the exchangeability of treatment assignment within matched triplets under the sharp null hypothesis of zero treatment effect: since matching renders the Ukrainian and control migrants observationally equivalent within each triplet, the sign of the within-triplet difference is equally likely to be positive or negative under the null. For each of 1,000 permutations, we independently and randomly flip the sign of the within-triplet difference for each triplet and recompute the average treatment effect across all triplets at each quarter. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter. Panel B shows prescriptions for anti-depressants. Panel C shows prescriptions for anti-anxiety or insomnia medications (immediate relief). These three outcomes are measured in percentage points. Panel D shows average monthly earnings per quarter, measured in 2024 SEK. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). The shaded area represents the permutation reference band showing the 5th and 95th percentiles of the distribution of placebo effects across 1,000 sign-flip permutations. The analysis uses 8,771 matched triplets

FIGURE A.11: PERMUTATION INFERENCE USING THE UNMATCHED SAMPLE



(A) MENTAL HEALTH PRESCRIPTIONS

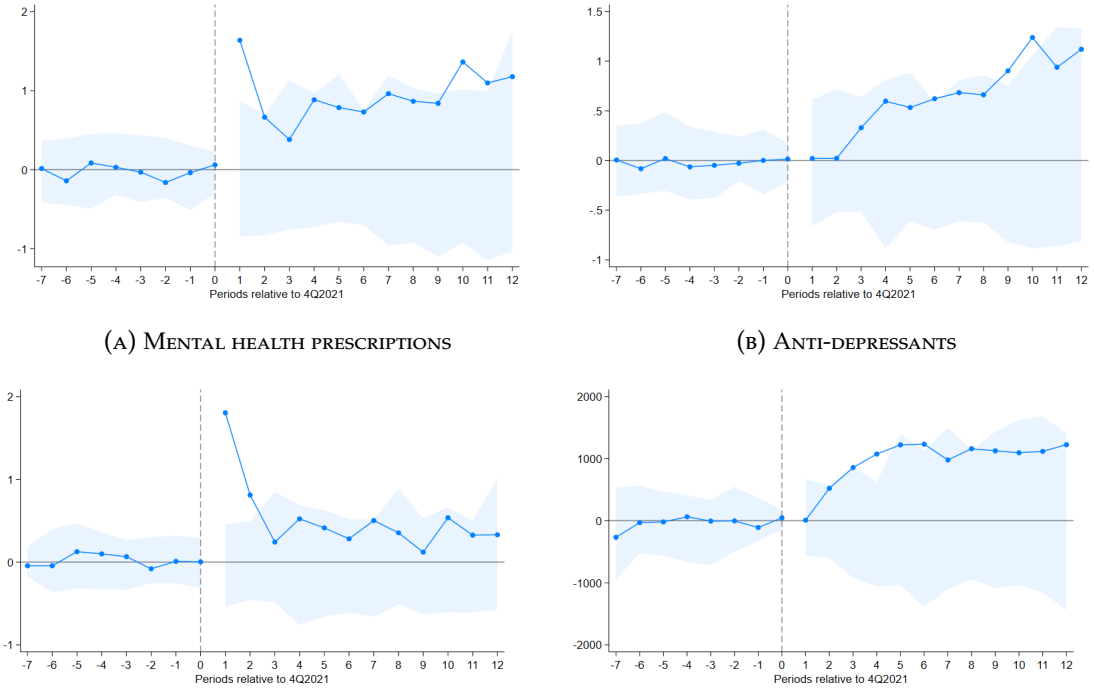
(B) ANTI-DEPRESSANTS

(C) ANTI-ANXIETY/INSOMNIA

(D) MONTHLY EARNINGS

Notes: This figure shows event-study estimates using country-level permutation inference. Following Abadie et al. (2010), we assign the treatment indicator in turn to each origin country in the sample, estimate the same two-way fixed effects specification as in the main analysis for each placebo assignment weighted by country-quarter cell size, and record the resulting coefficients. The donor pool is restricted to countries with at least 1,000 migrants who were registered as residing in Sweden throughout 2019–2024, excluding war-adjacent countries and individuals with Ukrainian parents or partners, as in the main analysis. To further ensure valid counterfactuals, we exclude any country that displays a statistically significant pre-period association between its outcomes and a placebo treatment indicator assigned over 2021 ($p < 0.10$); Ukraine is never excluded. The donor pool is constructed separately for each outcome. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter. Panel B shows prescriptions for anti-depressants. Panel C shows prescriptions for anti-anxiety or insomnia medications (immediate relief). These three outcomes are measured in percentage points. Panel D shows average monthly earnings per quarter. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). The shaded area represents the permutation reference band showing the 5th and 95th percentiles of the distribution of placebo effects across origin countries in the donor pool.

FIGURE A.12: SYNTHETIC DIFFERENCE-IN-DIFFERENCES



(A) MENTAL HEALTH PRESCRIPTIONS

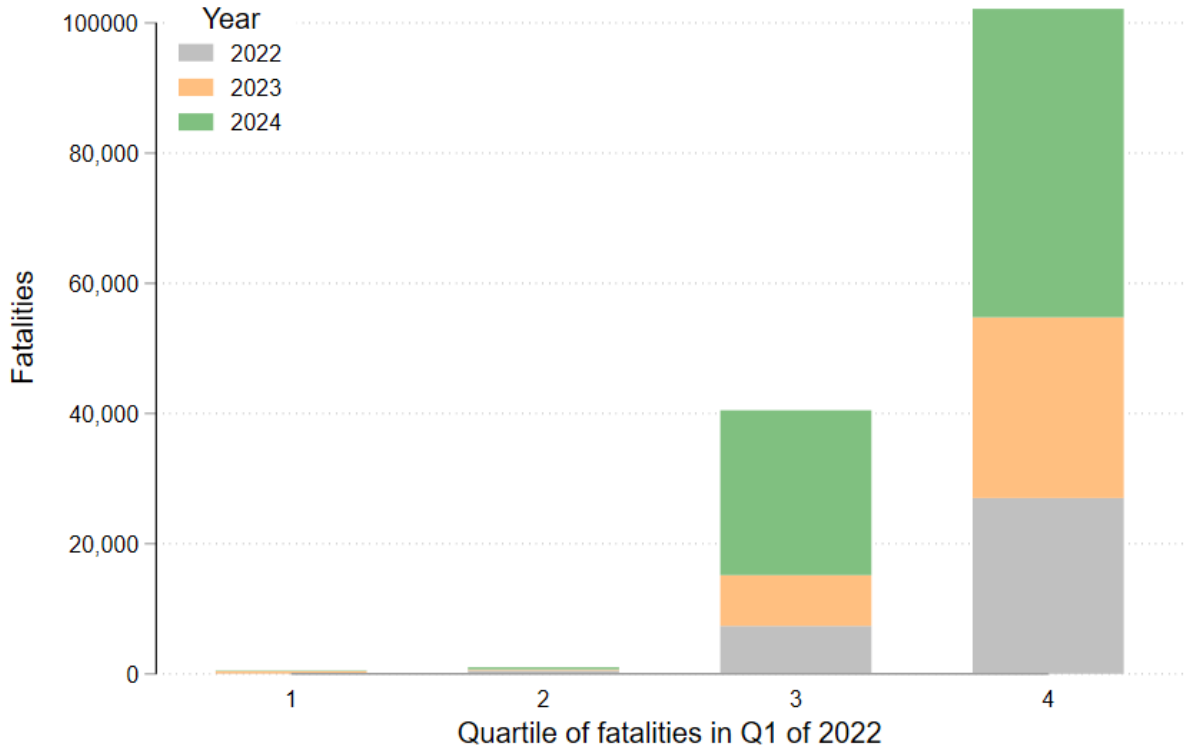
(B) ANTI-DEPRESSANTS

(C) ANTI-ANXIETY/INSOMNIA

(D) MONTHLY EARNINGS

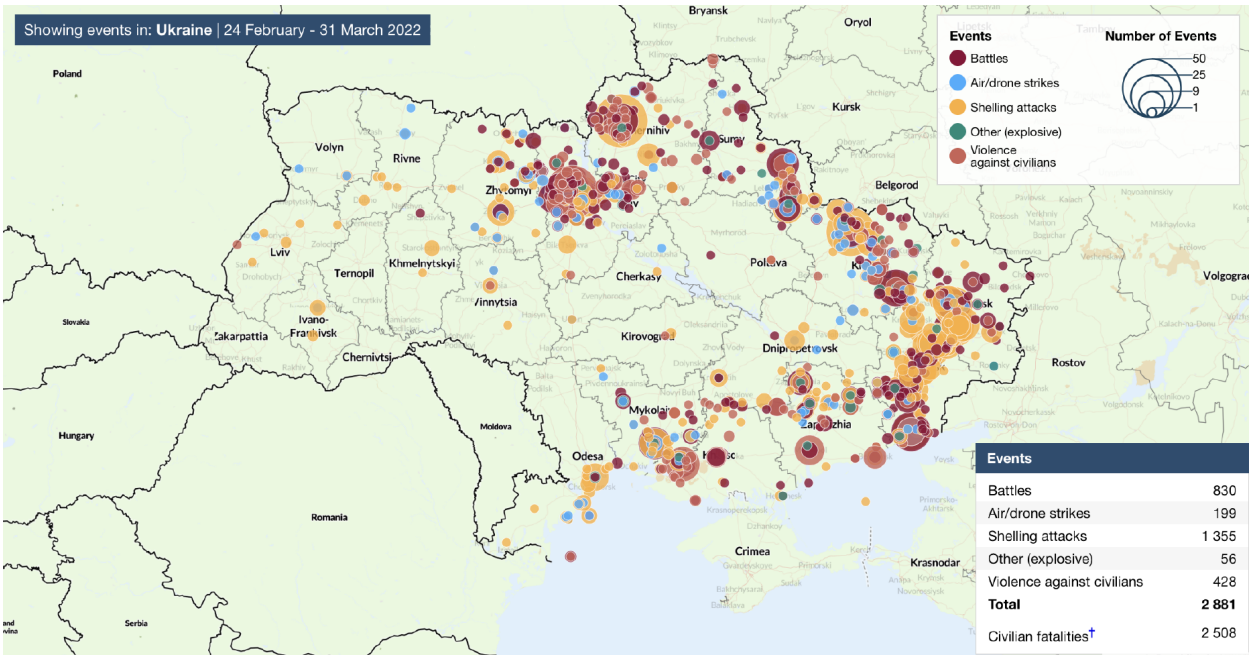
Notes: This figure shows event-study estimates using the synthetic difference-in-differences (SDID) estimator of Arkhangelsky et al. (2021) as an alternative to the two-way fixed effects specification. SDID combines synthetic control and difference-in-differences by optimally weighting both units and time periods to match pre-treatment outcome dynamics, thereby relaxing the parallel trends assumption. Panel A shows the probability of filling at least one prescription for any mental health medication per quarter. Panel B shows prescriptions for anti-depressants. Panel C shows prescriptions for anti-anxiety or insomnia medications (immediate relief). These three outcomes are measured in percentage points. Panel D shows average monthly earnings per quarter (SEK). The shaded area represents the placebo range showing the 2.5th and 97.5th percentiles of the distribution obtained from 95 placebo assignments (randomly assigning treatment to other origin countries).

FIGURE A.13: DISTRIBUTION OF FATALITIES OVER TIME

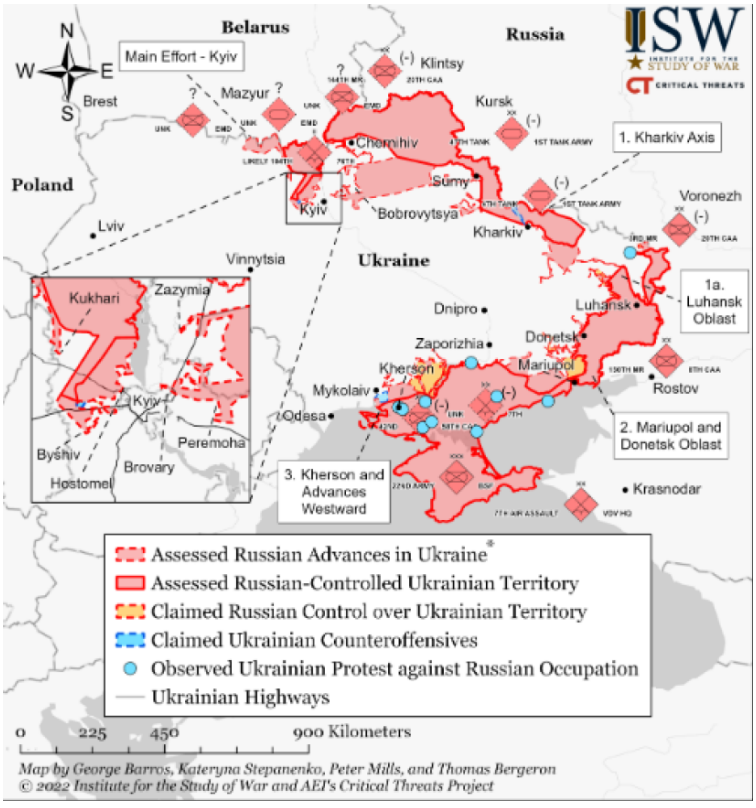


Notes: This figure shows the temporal persistence of conflict intensity across Ukrainian oblasts. Oblasts are grouped into quartiles based on the number of war-related fatalities during the first quarter of 2022 (February–March). The bars show total fatalities in each quartile for 2022, 2023, and 2024 separately. The figure demonstrates that oblasts with the highest fatality counts early in the war (Q1 2022) continued to experience the most fatalities in subsequent years, justifying the use of Q1 2022 fatalities as a measure of long-term conflict exposure. Fatality data are from the Armed Conflict Location & Event Data Project (ACLED).

FIGURE A.14: GEOGRAPHICAL DISTRIBUTION OF CONFLICT



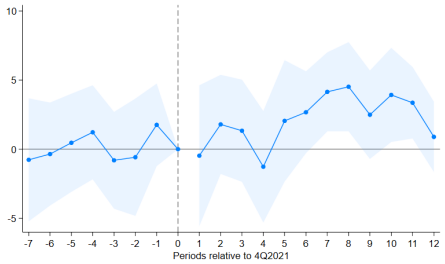
(A) CONFLICT EVENTS



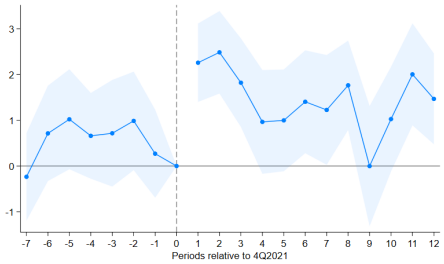
(B) OCCUPIED TERRITORIES

Notes: This figure shows the geographical distribution of conflict intensity during the first quarter of 2022. Panel A displays conflict events by type (battles, airstrikes, shelling, violence against civilians) from ACLED data for February–March 2022. Conflict is heavily concentrated in eastern oblasts bordering Russia (Donetsk, Luhansk, Kharkiv) and southern coastal regions near the Black Sea (Kherson, Zaporizhzhia). Panel B shows Russian territorial advances and occupied areas as of March 2022 from the Institute for the Study of War (ISW). The overlap between high-fatality areas in Panel A and territorial occupation in Panel B indicates that fatalities serve as a valid proxy for overall conflict exposure.

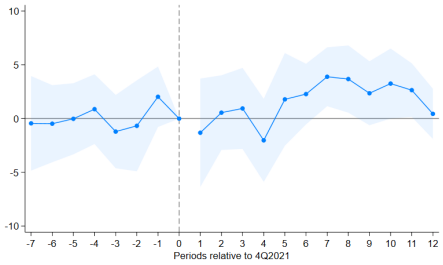
FIGURE A.15: PRIMARY CARE VISITS IN SKÅNE



(A) ANY VISIT



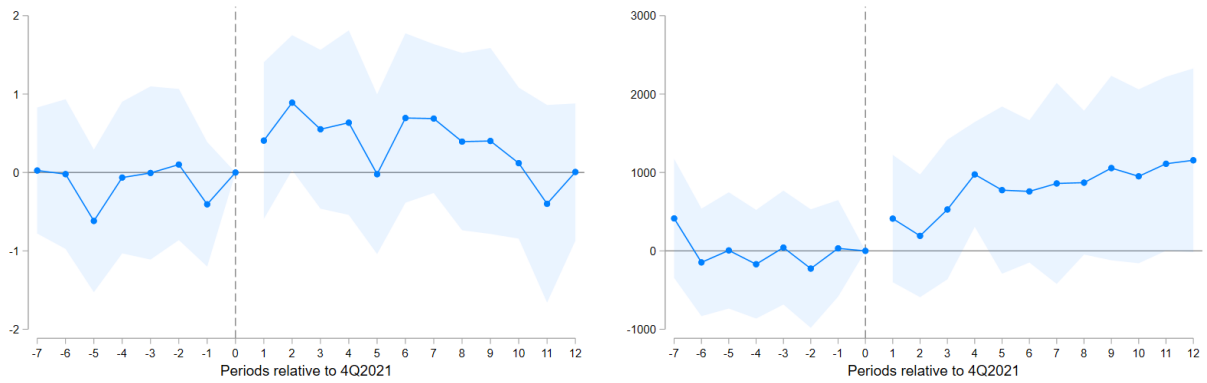
(B) MENTAL HEALTH VISIT



(C) OTHER VISIT

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on primary care visits among Ukrainian migrants in Skåne, Sweden. Panel A shows the probability of any primary care visit, Panel B any visit with a mental health diagnosis, and Panel C any visit for other (non-mental-health) diagnoses. Outcomes are measured at the quarterly level and expressed in percentage points. The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.]

FIGURE A.16: WITHIN UKRAINE COMPARISON

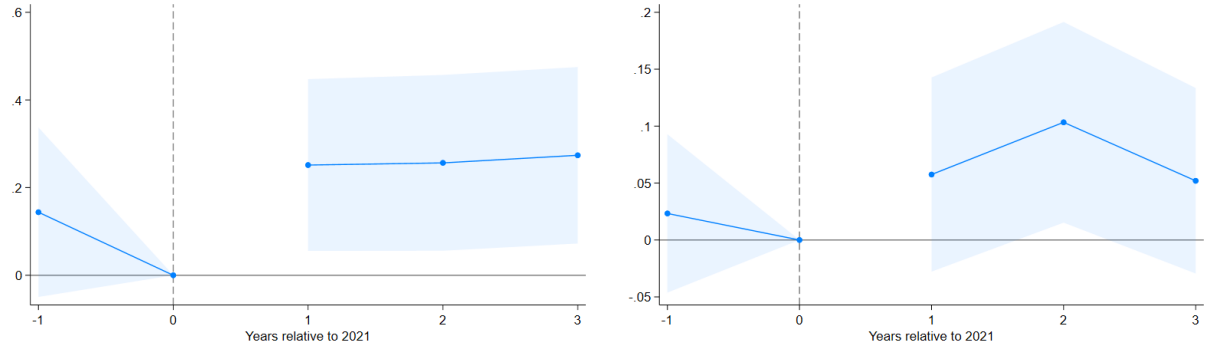


(A) ANY MENTAL HEALTH PRESCRIPTION, ABOVE MEDIAN FATALITIES

(B) MONTHLY EARNINGS (SEK), ABOVE MEDIAN FATALITIES.

Notes: This figure shows event-study estimates restricting the sample to Ukrainian migrants only, comparing those from high-exposure versus low-exposure oblasts. This within-Ukraine comparison isolates the role of regional conflict intensity by removing the main Ukraine effect. High exposure is defined as originating from an oblast with above-median war fatalities in Q1 2022 (20 or more deaths). Panel A shows the effect on the probability of filling at least one prescription for any mental health medication per quarter, measured in percentage points. Panel B shows the effect on average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). The vertical dashed line indicates the last quarter preceding the invasion (4Q2021). Standard errors clustered by oblast of origin. The shaded areas show the confidence intervals at the 95% level.

FIGURE A.17: SPECIALIST VISITS AND BURNOUT DIAGNOSIS



(A) ANY SPECIALIST VISIT RELATED TO MENTAL HEALTH

(B) BURNOUT

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on the probability of a specialist visit related to mental health (Panel A), and on a 'burnout' diagnosis (Panel B). Outcomes are measured at the yearly level for better precision given the rarity of the related events. The vertical dashed line indicates the last year preceding the invasion (2021). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

A.2 Tables

Table A.1: Medical drugs for mental health issues

Anti-depressant	ATC	Anti-anxiety	ATC	Insomnia	ATC	Antipsychotic	ATC
Clomipramine	N06AA04	Pregabalin	N02BF02	Nitrazepam	N05CD02	Haloperidol	N05AD01
Amitriptyline	N06AA09	Diazepam	N05BA01	Melatonin	N05CH01	Klozapin	N05AH02
Nortriptyline	N06AA10	Oxazepam	N05BA04	Zopiklone	N05CF01	Olanzapin	N05AH03
Fluoxetine	N06AB03	Lorazepam	N05BA06	Zolpidem	N05CF02	Quetiapin	N05AH04
Citalopram	N06AB04	Alprazolam	N05BA12	Propiomazine	N05CM06	Risperidon	N05AX08
Paroxetine	N06AB05	Hydroxyzine	N05BB01			Aripiprazol	N05AX12
Sertraline	N06AB06					Paliperidon	N05AX13
Fluvoxamine	N06AB08					Litium	N05AN01
Escitalopram	N06AB10					Ziprasidon	N05AE04
Moklobemide	N06AG02					Amisulprid	N05AL05
Mianserin	N06AX03					Melperon	N05AD03
Mirtazapin	N06AX11					Klorprotixen	N05AF03
Bupropion	N06AX12					Levomepromazin	N05AA02
Venlafaxin	N06AX16						
Agomelatin	N06AX22						
Duloxetin	N06AX21						
Vortioxetin	N06AX26						

Notes: This table lists the most commonly used medications in Sweden for treating anxiety, insomnia, depression, and psychosis, organized by therapeutic category. The Anatomical Therapeutic Chemical (ATC) classification system assigns codes to medications based on the organ or system on which they act and their therapeutic properties. Anti-depressants (ATC codes beginning with N06A) are used for long-term treatment of depression and anxiety disorders. Anti-anxiety medications (primarily benzodiazepines and pregabalin) and insomnia medications (primarily Z-drugs and benzodiazepines) provide immediate symptom relief but carry addiction risks with long-term use. Antipsychotics (ATC codes beginning with N05A) are prescribed for severe mental health conditions including schizophrenia, bipolar disorder, and treatment-resistant depression. Our main mental health outcome includes all medications from the first three categories (anti-depressants, anti-anxiety, and insomnia).

TABLE A.2: NUMBER OF INDIVIDUALS IN THE SAMPLE BY COUNTRY OF ORIGIN: MATCHED SAMPLE OF CONTROL MIGRANTS

Country	N	Share (%)
Syria	1,531	8.83
Iraq	1,332	7.68
Thailand	971	5.60
Iran	837	4.82
China	710	4.09
India	669	3.86
Germany	533	3.07
Somalia	513	2.96
USA	466	2.69
Turkey	417	2.40
United Kingdom	414	2.39
Bosnia and Herzegovina	403	2.32
Afghanistan	398	2.29
Philippines	367	2.12
Eritrea	335	1.93
Serbia	324	1.87
Brazil	261	1.50
Ethiopia	243	1.40
Pakistan	228	1.31
Greece	209	1.20
Yugoslavia	209	1.20
Vietnam	200	1.15
Lebanon	197	1.14
Chile	186	1.07
Italy	181	1.04
Colombia	176	1.01
Other countries	5,038	29.04
Total	17,348	100.00

Notes: This table shows the number of individuals per country of origin in the matched sample of control migrants. The sample is restricted to individuals age 14-64 who reside in Sweden 2019-2024.

Table A.3: Descriptive statistics: Ukrainian migrants compared to non-adjacent countries

	Rest of Countries			Ukraine			
	n	mean	sd	n	mean	sd	Diff
Female	1437792	0.49	0.50	8964	0.66	0.47	0.174***
Age	1437792	39.38	13.15	8964	37.77	11.36	-1.611*
Married with Swedish	1437792	0.09	0.29	8964	0.12	0.32	0.023
Married with other	1437792	0.37	0.48	8964	0.21	0.40	-0.161***
Had children	1437792	0.58	0.49	8964	0.55	0.50	-0.028*
Years in Sweden	1437792	15.99	12.91	8964	9.36	7.17	-6.629***
Had Swedish citizenship	1437792	0.62	0.49	8964	0.54	0.50	-0.075**
Had relative visa	1437792	0.11	0.31	8964	0.23	0.42	0.120***
Had work visa	1437792	0.04	0.19	8964	0.13	0.34	0.095***
Had student visa	1437792	0.01	0.09	8964	0.01	0.11	0.004**
Refugee	1437792	0.11	0.31	8964	0.02	0.14	-0.087***
No university education	1437792	0.54	0.50	8964	0.23	0.42	-0.313***
Mean annual family income (2020-21)	1437792	4596.80	7515.91	8964	4794.42	5530.15	197.625
Mean annual wage income (2020-21)	1437792	2263.32	2482.72	8964	2592.86	2331.73	329.545**

Notes: This table presents descriptive statistics for the full, unmatched sample. The sample includes all Ukrainian migrants and all other migrants (excluding those from Russia and European countries bordering Ukraine or Russia) aged 14–64 who resided in Sweden from 2019–2024. The last column reports the difference in means between Ukrainian and other migrants, with statistical significance indicated as: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.4: NUMBER OF INDIVIDUALS IN THE SAMPLE BY COUNTRY OF ORIGIN: FULL SAMPLE

Country of birth	N	Share (%)
Syria	142,311	9.90
Iraq	120,717	8.40
Poland	67,577	4.70
Iran	63,158	4.39
Somalia	56,337	3.92
Finland	55,458	3.86
Afghanistan	51,537	3.58
Bosnia and Herzegovina	47,434	3.30
Yugoslavia	44,246	3.08
Turkey	40,000	2.78
Eritrea	38,985	2.71
Thailand	37,881	2.63
India	27,515	1.91
Germany	27,351	1.90
China	24,309	1.69
Romania	24,302	1.69
Lebanon	23,650	1.64
Norway	20,771	1.44
Chile	20,733	1.44
Denmark	19,653	1.37
United Kingdom	19,324	1.34
Russia	18,172	1.26
Ethiopia	17,897	1.24
Other countries	428,474	29.80
Total	1,437,792	100.00

Notes: This table shows the number of individuals per country of origin for other migrants in the full sample. The sample is restricted to individuals aged 14-64 who reside in Sweden 2019-2024.

TABLE A.5: DECOMPOSITION OF MENTAL HEALTH USAGE BY PRIOR PRESCRIPTIONS

	Any drug		
	(1)	(2)	(3)
	Full sample	No prior drugs	Prior drugs
Ukraine × Post-2022	0.93***	0.77***	1.69***
	(0.10)	(0.12)	(0.43)
Observations	522380	426040	96340
Individuals (Ukraine)	8771	7145	1626
Individuals (Control)	17348	14157	3191
Share of Ukrainians		0.81	0.19
Mean (Ukraine)	5.60	0.00	30.23
Mean (Control)	5.95	0.00	32.34

Notes: This table decomposes the overall mental health effect by prior treatment status to determine the relative contributions of the extensive margin (new users) versus the intensive margin (existing users). Column 1 shows the baseline effect in the full sample. Column 2 restricts to individuals with no mental health prescriptions during 2018–2021, capturing the extensive margin. Column 3 restricts to individuals with at least one mental health prescription during 2018–2021, capturing the intensive margin. The extensive margin accounts for approximately 70% of the overall effect, calculated as: $s_0\tau_0/(s_0\tau_0 + s_1\tau_1)$ where $s_0 = 0.815$ is the share of Ukrainians with no prior prescriptions, τ_0 is the treatment effect for this group from Column 2, and τ_1 is the treatment effect for prior users from Column 3. The intensive margin shows a larger treatment effect in percentage points but contributes less to the aggregate due to the smaller number of individuals with prior prescriptions. All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

TABLE A.6: PRIMARY CARE VISITS IN SKÅNE

	Any Visit (1)	Mental Health (2)	Other (3)
Ukraine × 2022	0.23	1.37***	-0.47
	(0.79)	(0.29)	(0.79)
Ukraine × 2023	3.23***	0.83**	2.90***
	(0.67)	(0.34)	(0.70)
Ukraine × 2024	2.55***	0.61*	2.16***
	(0.68)	(0.35)	(0.72)
Observations	66820	66820	66820
Individuals (Ukraine)	1186	1186	1186
Individuals (Control)	2381	2381	2381
Mean (Ukraine)	34.09	4.70	33.21
Mean (Control)	39.68	4.30	38.75

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on primary care visits among Ukrainian migrants in Skåne, Sweden. Column 1 shows any primary care visits. Column 2 shows any visit with a mental health diagnosis, and Column 3 any visit for other (non-mental-health) diagnoses. The sample is restricted to migrants registered in the Skåne region. All specifications include individual and quarter fixed effects. Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

Table A.7: Mental health and labor market effects in Skåne

	Any drug (1)	Immediate relief drug (2)	Anti depressant (3)	Earnings (4)	Employment (5)	Multiple jobs (6)	Sickness absence (7)
Ukraine × 2022	1.07***	0.88***	0.87***	1083.73***	2.36***	1.62***	-1.02*
	(0.26)	(0.23)	(0.24)	(327.07)	(0.82)	(0.42)	(0.53)
Ukraine × 2023	1.04***	0.04	1.50***	1587.02***	3.18***	3.43***	-3.18***
	(0.30)	(0.25)	(0.30)	(389.87)	(0.91)	(0.48)	(0.62)
Ukraine × 2024	0.66*	-0.48	1.54***	2375.46***	2.41**		-3.00***
	(0.37)	(0.30)	(0.29)	(475.92)	(1.18)		(0.68)
Observations	66820	66820	66820	66820	66820	53340	66820
Individuals (Ukraine)	1186	1186	1186	1186	1186	1186	1186
Individuals (Control)	2381	2381	2381	2381	2381	2381	2381
Mean (Ukraine)	6.21	3.52	3.71	25026.22	67.73	9.14	12.98
Mean (Control)	6.04	3.01	4.29	22639.74	58.70	7.19	10.77

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on mental health and labor market outcomes among Ukrainian migrants in Skåne, Sweden. Columns (1)–(3) examine mental-health related prescription outcomes: any psychotropic drug, immediate-relief medication, and antidepressants. Column (4) reports average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). Column (5) measures employment rate, column (6) indicates holding multiple jobs, and column (7) captures sickness absence. All specifications include individual and quarter fixed effects. Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.8: MENTAL HEALTH PRESCRIPTIONS: SEVERITY

	Polypharmacy (1)	Number of pickups (2)	Antipsychotic (3)
Ukraine × 2022	0.276***	0.018***	0.083***
	(0.053)	(0.004)	(0.026)
Ukraine × 2023	0.154**	0.007	0.049
	(0.060)	(0.004)	(0.038)
Ukraine × 2024	0.294***	0.012***	0.050
	(0.053)	(0.004)	(0.041)
Observations	522380	522380	522380
Individuals (Ukraine)	8771	8771	8771
Individuals (Control)	17348	17348	17348
Mean (Ukraine)	1.25	0.11	0.68
Mean (Control)	1.27	0.13	0.69

Notes: This table examines indicators of mental health severity. Column 1 shows polypharmacy, defined as filling prescriptions for multiple types of mental health medications simultaneously (e.g., both anti-anxiety and anti-depressants) within the same quarter. Column 2 shows the total number of prescription pickups per quarter, where patients can pick up medications multiple times within a quarter but are limited to a 90-day supply per pickup. Column 3 shows the probability of filling at least one prescription for antipsychotic medications, which are typically prescribed for severe conditions including schizophrenia, bipolar disorder, and treatment-resistant depression. All three indicators suggest increasing severity of mental health conditions over time. The sample includes Ukrainian migrants and matched control migrants. All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

TABLE A.9: SPECIALIST VISITS AND BURNOUT DIAGNOSIS

	Any visit (1)	Any visit (2)	Burnout (3)	Burnout (4)
Ukraine × 2022	0.18*		0.05	
	(0.09)		(0.03)	
Ukraine × 2023	0.18*		0.09**	
	(0.10)		(0.04)	
Ukraine × 2024	0.20**		0.04	
	(0.10)		(0.04)	
Ukraine × Post		0.19**		0.06*
		(0.09)		(0.03)
Observations	130595	130595	130595	130595
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean (Ukraine)	1.63	1.63	0.24	0.24
Mean (Control)	1.69	1.69	0.16	0.16

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on the probability of visiting a specialist for mental health (columns 1-2) and on the probability of a 'burnout' diagnosis (columns 3-4). Outcomes are measured at the yearly level for better precision given the rarity of the related events. All specifications include individual and year fixed effects. Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.10: EFFECTS BY PRE-INVASION LABOR MARKET STATUS

	Earnings (1)	Employment (2)	Multiple jobs (3)
Ukraine × 2022	351.237	1.042*	1.028***
	(230.676)	(0.551)	(0.256)
Ukraine × 2023	648.005**	1.521***	1.081***
	(315.766)	(0.493)	(0.338)
Ukraine × 2024	724.741**	1.469**	
	(329.192)	(0.595)	
Ukraine × No earnings 2021Q4 × 2022	1148.365***	3.012***	-0.748**
	(260.275)	(0.616)	(0.291)
Ukraine × No earnings 2021Q4 × 2023	1758.179***	5.308***	-0.905**
	(316.981)	(1.026)	(0.394)
Ukraine × No earnings 2021Q4 × 2024	1467.080***	3.984***	
	(316.808)	(1.164)	
Ukraine × Unemployed 2021Q4 × 2022	1084.276***	3.905***	3.597***
	(309.124)	(1.075)	(0.714)
Ukraine × Unemployed 2021Q4 × 2023	1651.576***	5.804***	2.718***
	(422.936)	(1.689)	(0.940)
Ukraine × Unemployed 2021Q4 × 2024	601.983	2.612	
	(518.243)	(1.813)	
Observations	522380	522380	417904
Individuals (Ukraine)	8771	8771	8771
Individuals (Control)	17348	17348	17348
Mean	26092	65.84	9.73
Mean (Ukraine)	26611	69.23	10.49
Mean (Control)	25829	64.13	9.34

Notes: This table examines heterogeneous treatment effects by pre-invasion labor market attachment. Individuals are classified into three groups based on their status in Q4 2021: (1) Employed (benchmark group: positive earnings in Q4 2021), (2) *Unemployed 2021Q4* (registered with the Public Employment Service in November 2021), and (3) *No earnings 2021Q4* (zero earnings in Q4 2021). The sample includes Ukrainian migrants and matched control migrants. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.11: JOB QUALITY EFFECTS: OCCUPATION

	Mean occupation earnings (1)	Earnings (2)	Earnings Residual (3)	Rank (Earnings | occupation-education) (4)	Rank (Education | occupation) (5)
Ukraine × 2022	-163.74	-628.59***	-470.76**	-0.96***	0.11
	(110.62)	(194.82)	(183.39)	(0.22)	(0.15)
Ukraine × 2023	-42.13	-245.24	-168.23	-0.96**	-0.21
	(166.42)	(264.21)	(257.44)	(0.39)	(0.21)
Observations	251008	251008	251008	251008	237694
Individuals (Ukraine)	7021	7021	7021	7021	6772
Individuals (Control)	12837	12837	12837	12837	12204
Mean (Ukraine)	41360	39994	-3216	50.08	67.36
Mean (Control)	41804	42704	-0	51.58	62.74

Notes: This table shows the effect of the 2022 Russian invasion of Ukraine on job quality measures for the primary (first) job, using occupation-based measures instead of firm-based measures. Column 1 shows mean occupation earnings, defined as the leave-one-out average earnings across all workers in Sweden in the individual's 3-digit occupation code (SSYK 2012). Note that occupation information coverage is lower for small private firms. Column 2 shows the individual's own earnings. Column 3 shows earnings residuals from a Mincer regression controlling for age, education, and years in Sweden. Column 4 shows the individual's earnings rank within their occupation, controlling for education level (percentile ranks). Column 5 shows the individual's education rank within their occupation (percentile ranks). Earnings are measured in 2024 SEK value (100 SEK ≈ $11). Ranks are percentile ranks ranging from 0 to 100. All models control for country and quarter fixed effects. The sample includes Ukrainian migrants and matched control migrants employed in a given quarter. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.12: JOB QUALITY EFFECTS: UNEMPLOYED BETWEEN 3Q2020-4Q2021

	Exit hazard (pp) (1)	Mean firm earnings (2)	Earnings (3)	Earnings Residual (4)	Rank (Earnings | firm-education) (5)
Ukraine × 2022	6.23***	-890.16	-1399.82	-2476.16	-9.28***
	(1.66)	(1129.41)	(1617.18)	(1852.72)	(2.65)
Ukraine × 2023	3.13	-4660.52***	-4963.58***	-7476.21***	-0.96
	(2.59)	(1626.83)	(1863.22)	(1891.91)	(4.55)
Observations	6112	1489	1489	1489	1489
Individuals (Ukraine)	572	474	474	474	474
Individuals (Control)	1259	978	978	978	978
Mean (Ukraine)	30.85	30197.72	21026.10	-16123.55	50.53
Mean (Control)	29.35	28754.74	19029.42	-17350.32	46.95

Notes: This table shows the effect of the 2022 Russian invasion of Ukraine on exit from unemployment and accepted job quality among Ukrainian migrants in Sweden. The sample consists of Ukrainian migrants and matched control migrants with unemployment spells beginning between 2020Q3 and 2021Q4, followed through 2023Q3. Column 1 reports the quarterly exit hazard, defined as the probability of transitioning out of unemployment in a given quarter, measured in percentage points, estimated on the full sample of unemployment spell quarters with individual and quarter fixed effects. Columns 2–5 report job quality outcomes measured in the first quarter of employment following exit, estimated on the subsample of exiting spells with country-of-origin and quarter fixed effects. Column 2 shows mean earnings at the exit firm, defined as the leave-one-out average earnings across all workers at the firm. Column 3 shows the individual's own earnings. Column 4 shows earnings residuals from a Mincer regression controlling for age, education, and years in Sweden. Column 5 shows the individual's earnings rank within the exit firm, conditional on education level (percentile rank, range 0–100). Earnings are measured in 2024 SEK value (100 SEK ≈$11). All specifications control for spell duration and entry cohort fixed effects. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.13: ESTIMATES INCLUDING ADJACENT COUNTRY MIGRANTS

	Any drug (1)	Earnings (2)
Ukraine × 2022	0.82***	630.41***
	(0.11)	(173.88)
Ukraine × 2023	0.77***	863.84***
	(0.12)	(255.84)
Ukraine × 2024	1.01***	973.10***
	(0.14)	(325.32)
Observations	524120	524120
Individuals (Ukraine)	8798	8798
Individuals (Control)	17408	17408
Mean (Ukraine)	5.59	26684
Mean (Control)	5.95	26328

Notes: This table shows robustness checks, including migrants from European countries adjacent to the conflict (Poland, Baltic states, and other countries bordering Ukraine or Russia) in the control group. Column 1 shows the probability of filling at least one prescription for any mental health medication per quarter. Column 2 shows average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.14: ESTIMATES INCLUDING OUT-MIGRANTS

	Any drug (1)	Earnings (2)
Ukraine × 2022	0.88***	598.39***
	(0.11)	(178.22)
Ukraine × 2023	0.75***	913.64***
	(0.13)	(274.91)
Ukraine × 2024	1.15***	830.22**
	(0.14)	(324.69)
Observations	543488	543488
Individuals (Ukraine)	9347	9347
Individuals (Control)	18512	18512
Mean (Ukraine)	5.40	25838
Mean (Control)	5.80	24778

Notes: This table shows robustness checks using an unbalanced panel that allows for emigration after the invasion. The main analysis restricts the sample to individuals who remain in Sweden through 2024. This specification requires only that individuals reside in Sweden continuously from 2019–2021, allowing them to emigrate at any point thereafter. Results are very similar to the main estimates, suggesting that differential emigration does not drive the findings. Column 1 shows the probability of filling at least one prescription for any mental health medication per quarter. Column 2 shows average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

TABLE A.15: OTHER CHRONIC-CONDITION DRUGS

	Cardiovascular (1)	Other chronic conditions (2)
Ukraine × 2022	0.060	-0.132
	(0.110)	(0.149)
Ukraine × 2023	-0.066	0.028
	(0.138)	(0.159)
Ukraine × 2024	-0.131	0.028
	(0.175)	(0.278)
Observations	522380	522380
Individuals (Ukraine)	8771	8771
Individuals (Control)	17348	17348
Mean (Ukraine)	4.72	11.79
Mean (Control)	6.97	16.89

Notes: This table shows the difference-in-differences estimates for prescriptions for medications unrelated to mental health. Column 1 shows prescriptions for cardiovascular medications (ATC codes C01–C10), which treat conditions including heart disease, hypertension, and high cholesterol. Column 2 shows prescriptions for other chronic conditions including diabetes (ATC A10), respiratory conditions (ATC R03), and musculoskeletal disorders (ATC M01–M05). All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table A.16: Top 10 Employment Sectors by Migrant Group and Time Period (First Job)

Panel A: Ukrainian Migrants

2020-2021 (1)		2022-2023 (2)	
Education	12.02	Education	12.75
Human health activities	7.59	Human health activities	7.85
Specialised construction activities	6.77	Specialised construction activities	6.24
Services to buildings and landscape activities	5.90	Residential care activities	5.21
Social work activities without accommodation	5.36	Social work activities without accommodation	5.07
Residential care activities	5.11	Services to buildings and landscape activities	4.90
Computer programming, consultancy and related activities	4.48	Public administration and defence; compulsory social security	4.63
Public administration and defence; compulsory social security	4.12	Computer programming, consultancy and related activities	4.19
Retail trade, except of motor vehicles and motorcycles	4.07	Retail trade, except of motor vehicles and motorcycles	4.16
Construction of buildings	3.82	Construction of buildings	3.30
Sum of Top 10	59.24	Sum of Top 10	58.31

Panel B: Other Migrants

2020-2021 (1)		2022-2023 (2)	
Education	13.49	Education	12.94
Social work activities without accommodation	7.20	Residential care activities	7.60
Human health activities	7.17	Human health activities	7.41
Residential care activities	7.01	Social work activities without accommodation	6.79
Computer programming, consultancy and related activities	6.07	Food and beverage service activities	6.01
Food and beverage service activities	5.90	Computer programming, consultancy and related activities	5.63
Services to buildings and landscape activities	4.44	Services to buildings and landscape activities	4.18
Retail trade, except of motor vehicles and motorcycles	4.06	Retail trade, except of motor vehicles and motorcycles	3.94
Public administration and defence; compulsory social security	3.70	Public administration and defence; compulsory social security	3.80
Wholesale trade, except of motor vehicles and motorcycles	3.41	Wholesale trade, except of motor vehicles and motorcycles	3.50
Sum of Top 10	62.47	Sum of Top 10	61.79

Notes: Table shows the top 10 employment sectors for first job by migrant group and time period. Each column displays sectors ranked by their share within that specific group-period. Percentages represent share of total employment within each group-period. Sector classifications based on SNI 2007 (Swedish Standard Industrial Classification) 2-digit codes. Sample includes all employed individuals in respective groups and periods.

Table A.17: Top 10 Employment Sectors by Migrant Group and Time Period (Second Job)

Panel A: Ukrainian Migrants

2020-2021 (1)		2022-2023 (2)	
Social work activities without accommodation	13.51	Social work activities without accommodation	11.52
Education	9.87	Education	11.44
Services to buildings and landscape activities	9.47	Other professional, scientific and technical activities	9.81
Human health activities	7.35	Human health activities	6.83
Residential care activities	5.62	Services to buildings and landscape activities	6.12
Employment activities	3.86	Residential care activities	6.12
Food and beverage service activities	3.78	Food and beverage service activities	3.99
Retail trade, except of motor vehicles and motorcycles	3.64	Accommodation	3.48
Specialised construction activities	3.46	Employment activities	3.27
Sports activities and amusement and recreation activities	3.43	Public administration and defence; compulsory social security	3.00
Sum of Top 10	64.00	Sum of Top 10	65.58

Panel B: Other Migrants

2020-2021 (1)		2022-2023 (2)	
Social work activities without accommodation	15.85	Social work activities without accommodation	15.32
Education	9.64	Residential care activities	9.96
Residential care activities	9.46	Education	8.40
Services to buildings and landscape activities	9.24	Services to buildings and landscape activities	8.39
Food and beverage service activities	6.96	Food and beverage service activities	8.33
Human health activities	6.73	Human health activities	6.36
Employment activities	4.81	Employment activities	5.45
Land transport and transport via pipelines	3.17	Retail trade, except of motor vehicles and motorcycles	3.96
Retail trade, except of motor vehicles and motorcycles	3.09	Accommodation	2.97
Accommodation	2.73	Land transport and transport via pipelines	2.80
Sum of Top 10	71.69	Sum of Top 10	71.94

Notes: Table shows the top 10 employment sectors for the second job by migrant group and time period. Each column displays sectors ranked by their share within that specific group-period. Percentages represent share of total employment within each group-period. Sector classifications based on SNI 2007 (Swedish Standard Industrial Classification) 2-digit codes. Sample includes all individuals with a second job in respective groups and periods.

Table A.18: Top 10 Occupations by Migrant Group and Time Period (First Job)

Panel A: Ukrainian Migrants			
2020-2021 (1)		2022-2023 (2)	
ICT architects, systems analysts and test managers	7.45	ICT architects, systems analysts and test managers	7.09
Cleaners and helpers	6.84	Cleaners and helpers	6.00
Personal care workers in health services	5.11	Primary- and pre-school teachers	5.42
Office assistants and other secretaries	4.22	Personal care workers in health services	5.24
Primary- and pre-school teachers	4.18	Office assistants and other secretaries	4.06
Carpenters, bricklayers and construction workers	4.10	Carpenters, bricklayers and construction workers	4.06
Attendants, personal assistants and related workers	3.16	Attendants, personal assistants and related workers	3.21
Shop staff	2.80	Shop staff	3.01
Child care workers and teachers aides	2.73	Child care workers and teachers aides	2.98
University and higher education teachers	2.73	Engineering professionals	2.64
Sum of Top 10	43.32	Sum of Top 10	43.72

Panel B: Other Migrants			
2020-2021 (1)		2022-2023 (2)	
ICT architects, systems analysts and test managers	7.62	ICT architects, systems analysts and test managers	7.38
Cleaners and helpers	6.65	Cleaners and helpers	6.34
Personal care workers in health services	5.81	Personal care workers in health services	6.14
Primary- and pre-school teachers	4.75	Primary- and pre-school teachers	4.75
Fast-food workers, food preparation assistants	4.01	Child care workers and teachers aides	4.10
Child care workers and teachers aides	4.00	Fast-food workers, food preparation assistants	4.00
Attendants, personal assistants and related workers	3.58	Attendants, personal assistants and related workers	3.64
Engineering professionals	3.36	Engineering professionals	3.38
Health care assistants	2.97	Health care assistants	3.21
Physical and engineering science technicians	2.65	Shop staff	2.41
Sum of Top 10	45.40	Sum of Top 10	45.36

Notes: Table shows the top 10 occupations for first job (j1) by migrant group and time period. Each column displays occupations ranked by their share within that specific group-period. Percentages represent share of total employment within each group-period. Occupation classifications based on SSYK 2012 (Swedish Standard Classification of Occupations) 3-digit codes. Sample includes all employed individuals in respective groups and periods.

TABLE A.19: PERMUTATION INFERENCE USING THE MATCHED SAMPLE

	Any drug	Immediate	Anti-depressant	Earnings
	(1)	(2)	(3)	(4)
Ukraine × 2022	1.011	0.780	0.419	768.687
p-value	0.001	0.001	0.009	0.001
Placebo range (2.5th–97.5th pctile)	[-0.365, 0.348]	[-0.259, 0.287]	[-0.282, 0.313]	[-316.246, 293.760]
Ukraine × 2023	0.689	0.260	0.640	1007.684
p-value	0.004	0.085	0.001	0.001
Placebo range (2.5th–97.5th pctile)	[-0.415, 0.440]	[-0.290, 0.301]	[-0.352, 0.392]	[-379.722, 360.975]
Ukraine × 2024	1.060	0.297	1.109	834.426
p-value	0.001	0.079	0.001	0.002
Placebo range (2.5th–97.5th pctile)	[-0.486, 0.462]	[-0.319, 0.338]	[-0.419, 0.410]	[-429.087, 408.503]

Notes: Each column reports yearly treatment effect estimates using matched-triplet permutation inference as an alternative inference procedure to the cluster-robust standard errors reported in the main analysis. Following Rosenbaum (2002), we exploit the exchangeability of treatment assignment within matched triplets under the sharp null hypothesis of zero treatment effect. For each of 1,000 permutations, we independently and randomly flip the sign of the within-triplet difference for each triplet and recompute the average treatment effect for each post-invasion year. Columns (1)–(3) report results for mental health prescription outcomes: any mental health drug, immediate-relief drugs (anti-anxiety and insomnia medications), and anti-depressants, respectively, measured in percentage points. Column (4) reports results for average monthly earnings, measured in 2024 SEK. For each outcome and year, we report the treatment effect estimate (Ukraine × Year), the two-tailed permutation p-value defined as the fraction of permuted statistics with absolute value at least as large as the observed statistic, and the placebo range showing the 2.5th and 97.5th percentiles of the permutation distribution. The analysis uses 8,771 matched triplets

TABLE A.20: PERMUTATION INFERENCE USING THE UNMATCHED SAMPLE

	Any drug	Immediate	Anti-depressant	Earnings
	(1)	(2)	(3)	(4)
Ukraine × 2022	1.028	0.832	0.362	931.385
p-value	0.011	0.012	0.161	0.057
Placebo range (2.5th–97.5th pctile)	[-0.522, 0.781]	[-0.472, 0.735]	[-0.406, 0.651]	[-976.707, 1026.615]
Ukraine × 2023	0.950	0.387	0.775	1573.156
p-value	0.034	0.093	0.034	0.011
Placebo range (2.5th–97.5th pctile)	[-0.660, 1.177]	[-0.446, 0.582]	[-0.466, 0.796]	[-1554.801, 1333.210]
Ukraine × 2024	1.244	0.344	1.162	1698.220
p-value	0.034	0.174	0.000	0.046
Placebo range (2.5th–97.5th pctile)	[-0.808, 1.202]	[-0.469, 0.625]	[-0.732, 1.032]	[-1676.940, 1657.988]

Notes: Each column reports yearly treatment effect estimates using country-level permutation inference as an alternative inference procedure to the cluster-robust standard errors reported in the main analysis. We assign the treatment indicator in turn to each origin country in the sample, estimate the same two-way fixed effects specification as in the main analysis for each placebo assignment weighted by country-quarter cell size, and record the resulting coefficients. The donor pool is restricted to countries with at least 1,000 migrants who were registered as residing in Sweden throughout 2019–2024, excluding war-adjacent countries and individuals with Ukrainian parents or partners, as in the main analysis. To further ensure valid counterfactuals, we exclude any country that displays a statistically significant pre-period association between its outcomes and a placebo treatment indicator assigned over 2021 ($p < 0.10$); Ukraine is never excluded. The donor pool is constructed separately for each outcome. Columns (1)–(3) report results for mental health prescription outcomes: any mental health drug, immediate-relief drugs (anti-anxiety and insomnia medications), and anti-depressants, respectively, measured in percentage points. Column (4) reports results for average monthly earnings. For each outcome and year, we report the treatment effect estimate (Ukraine × Year), the two-tailed permutation p-value defined as the fraction of placebo statistics with absolute value at least as large as the observed statistic, and the placebo range showing the 2.5th and 97.5th percentiles of the permutation distribution. The effective number of donor countries used for the four outcomes are 87, 87, 86, and 87, respectively.

TABLE A.21: SYNTHETIC DIFFERENCE-IN-DIFFERENCES ESTIMATES BY YEAR

	Any drug	Immediate	Anti-depressant	Earnings
	(1)	(2)	(3)	(4)
Ukraine × 2022	0.892	0.845	0.243	615.611
p-value	0.000	0.000	0.265	0.047
Placebo range (2.5th–97.5th pctile)	[-0.558, 0.712]	[-0.439, 0.524]	[-0.424, 0.516]	[-669.750, 477.744]
Ukraine × 2023	0.836	0.388	0.626	1148.859
p-value	0.037	0.123	0.017	0.037
Placebo range (2.5th–97.5th pctile)	[-0.695, 0.836]	[-0.441, 0.520]	[-0.539, 0.607]	[-1109.158, 1123.094]
Ukraine × 2024	1.119	0.328	1.051	1140.965
p-value	0.045	0.217	0.023	0.075
Placebo range (2.5th–97.5th pctile)	[-0.902, 1.085]	[-0.515, 0.578]	[-0.789, 1.002]	[-1029.237, 1382.715]

Notes: Each column reports synthetic difference-in-differences estimates comparing Ukrainian-born migrants to synthetic control groups constructed from other incumbent migrants in Sweden, by year relative to the 2022 invasion. Columns (1)–(3) report results for mental health prescription outcomes: any mental health drug, immediate-relief drugs (anti-anxiety and insomnia medications), and anti-depressants, respectively, measured in percentage points. Column (4) reports results for average monthly earnings. For each outcome and year, we report the treatment effect estimate (Ukraine × Year), p-values, and the placebo range showing the 2.5th and 97.5th percentiles of the placebo distribution. The analysis uses 95 placebo countries.

TABLE A.22: MEASURING FATALITIES IN LOGS

	Any drug		Earnings	
	(1)	(2)	(3)	(4)
Ukraine × 2022	0.454	0.410	106.522	47.549
	(1.31)	(1.11)	(0.45)	(0.16)
Ukraine × 2023	0.412	0.706**	150.433	425.275
	(1.27)	(2.11)	(0.43)	(0.80)
Ukraine × 2024	1.335***	1.589***	-376.569	-76.993
	(4.10)	(3.98)	(-0.95)	(-0.14)
Ukraine × Fatalities 2022Q1 × 2022	0.130**	0.130**	148.612***	192.936***
	(2.00)	(2.01)	(4.93)	(7.26)
Ukraine × Fatalities 2022Q1 × 2023	0.073	0.083	201.611***	280.406***
	(0.98)	(1.06)	(4.69)	(5.14)
Ukraine × Fatalities 2022Q1 × 2024	-0.055	-0.046	274.594***	357.762***
	(-0.90)	(-0.73)	(5.97)	(5.64)
Horse-race interactions	No	Yes	No	Yes
Observations	501500	501500	501500	501500
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean	5.83	5.83	26092	26092
Mean (Ukraine)	5.60	5.60	26611	26611
Mean (Control)	5.95	5.95	25829	25829

Notes: This table shows robustness checks using log-transformed fatality measures instead of the above/below median indicator. *Fatalities 2022Q1* is defined as one plus the log of war fatalities in the individual's oblast of origin during the first quarter of 2022. *Any drug* is an indicator for filling at least one prescription for a mental health medication in a quarter. *Earnings* denotes average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). *Horse-race interactions* indicate inclusion of the triple interaction between *Ukraine*, post-invasion year dummies, and indicators for being Swedish citizen and for having above-median years in Sweden. Standard errors are clustered by country of origin for non-Ukrainians, and by birth oblast for Ukrainians. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.23: MEASURING FATALITIES IN LOGS 2022 TO 2024

	Any drug		Earnings	
	(1)	(2)	(3)	(4)
Ukraine × 2022	0.323	0.290	145.194	-9.787
	(0.74)	(0.59)	(0.61)	(-0.03)
Ukraine × 2023	0.515	0.782	88.690	197.548
	(1.06)	(1.54)	(0.22)	(0.34)
Ukraine × 2024	1.171***	1.415***	-468.535	-339.314
	(2.74)	(2.99)	(-0.98)	(-0.53)
Ukraine × Fatalities × 2022	0.108	0.108	93.618***	138.981***
	(1.60)	(1.65)	(4.35)	(5.37)
Ukraine × Fatalities × 2023	0.033	0.043	144.790***	226.416***
	(0.39)	(0.50)	(3.40)	(4.15)
Ukraine × Fatalities × 2024	-0.012	-0.001	198.430***	284.102***
	(-0.18)	(-0.02)	(3.73)	(4.23)
Horse-race interactions	No	Yes	No	Yes
Observations	501500	501500	501500	501500
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean	5.83	5.83	26092	26092
Mean (Ukraine)	5.60	5.60	26611	26611
Mean (Control)	5.95	5.95	25829	25829

Notes: This table shows robustness checks using cumulative fatalities over the entire 2022–2024 period instead of only Q1 2022. *Fatalities* is defined as one plus the log of total war fatalities in the individual's oblast of origin during 2022–2024. Columns 2 and 4 restrict the sample to Ukrainians only. Columns 1–2 show the probability of filling at least one prescription for any mental health medication per quarter. Columns 3–4 show average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). Standard errors are clustered by country of origin for non-Ukrainians, and by birth oblast for Ukrainians. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.24: Balance test for exposure to conflict fatalities

	(1) Low exposure		(2) High exposure		(1)-(2) Pairwise t-test	
Variable	N/Clusters	Mean/(SE)	N/Clusters	Mean/(SE)	N/Clusters	Beta coefficient
Female	2704	0.655	5023	0.680	7727	-0.025
	13	(0.028)	12	(0.009)	25	
Age	2704	37.385	5023	37.680	7727	-0.295
	13	(0.208)	12	(0.370)	25	
Has childre	2704	0.560	5023	0.563	7727	-0.003
	13	(0.007)	12	(0.007)	25	
Married	2704	0.531	5023	0.514	7727	0.017
	13	(0.019)	12	(0.011)	25	
Married to Ukrainian	2704	0.209	5023	0.180	7727	0.029
	13	(0.026)	12	(0.012)	25	
Swedish citizen	2704	0.494	5023	0.603	7727	-0.108**
	13	(0.041)	12	(0.015)	25	
Above-median years in Sweden	2704	0.416	5023	0.514	7727	-0.098**
	13	(0.033)	12	(0.014)	25	
Higher education	2704	0.239	5023	0.240	7727	-0.001
	13	(0.008)	12	(0.011)	25	
Earnings 2020	2704	25020.048	5023	26085.975	7727	-1065.926
	13	(397.026)	12	(681.048)	25	
Earnings 2021	2704	26946.847	5023	27949.098	7727	-1002.252
	13	(506.501)	12	(710.218)	25	
F-test of joint significance (F-stat)						1.625
F-test, number of observations						7727
F-test, number of clusters						25

Notes: This table shows a balance test of exposure to conflict fatalities in the birth oblast with respect to pre-invasion characteristics. All time-varying chara cteristics are measured in 2020. *Higher education* is a indicator for having a university degree. *Earnings 2020* and *Earnings 2021* are mean monthly earnings in each year, respectively, measured in SEK. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.25: EFFECTS BY REFUGEE RECEPTION: ROBUSTNESS

	Any drug		Earnings	
	(1)	(2)	(3)	(4)
Ukraine × 2022	1.059***	1.068***	716.069***	717.369***
	(0.138)	(0.141)	(191.745)	(192.697)
Ukraine × 2023	0.759***	0.774***	929.631***	927.454***
	(0.152)	(0.152)	(293.249)	(293.685)
Ukraine × 2024	1.132***	1.123***	801.864**	796.604**
	(0.162)	(0.162)	(321.567)	(321.568)
Ukraine × 2022 × Refugees	-0.326**		179.481	
	(0.128)		(145.839)	
Ukraine × 2023 × Refugees	-0.311*		5.096	
	(0.184)		(179.858)	
Ukraine × 2024 × Refugees	-0.198		57.960	
	(0.179)		(212.582)	
Ukraine × 2022 × Assigned refugees		-0.345**		250.633
		(0.138)		(174.141)
Ukraine × 2023 × Assigned refugees		-0.339*		32.807
		(0.198)		(178.716)
Ukraine × 2024 × Assigned refugees		-0.393*		41.795
		(0.208)		(222.188)
Observations	520900	521860	520900	521860
Individuals (Ukraine)	8771	8771	8771	8771
Individuals (Control)	17348	17348	17348	17348
Mean (Ukraine)	5.60	5.60	26611.03	26611.03
Mean (Control)	5.95	5.95	25829.25	25829.25

Notes: This table shows heterogeneous treatment effects depending on the reception of Ukrainian refugees in the individual's municipality in 2022. *Refugees* is measured as the number of Ukrainian refugees hosted by the municipality in 2022 relative to the number of Ukrainians already living in the municipality in 2021. Columns 1 and 3 use all refugees arriving in the municipality. Columns 2 and 4 use only refugees who were centrally assigned by the Swedish Migration Agency based on housing availability. Columns 1–2 show the probability of filling at least one prescription for any mental health medication. Columns 3–4 show average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). All models control for individual and municipality-by-quarter fixed effects. The sample includes Ukrainian migrants and matched control migrants. Standard errors are clustered by country of origin and municipality. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.26: OUTMIGRATION

	Out-migration	
	(1)	(2)
	High return intentions	Low return intentions
2022	1.81***	0.79***
	(0.24)	(0.22)
2023	4.36***	1.78***
	(0.43)	(0.35)
2024	7.50***	2.38***
	(0.71)	(0.48)
Ukraine × 2022	-0.85***	-0.62***
	(0.24)	(0.22)
Ukraine × 2023	-1.98***	-0.56
	(0.43)	(0.35)
Ukraine × 2024	-2.61***	-0.10
	(0.71)	(0.48)
Observations	28446	4746
Individuals (Ukraine)	4279	572
Individuals (Control)	5203	1010
Mean out-migration	3.74	1.50
Mean migration (Ukraine)	2.74	1.22
Mean migration (Control)	4.56	1.65

Notes: Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.27: EFFECT BY LONG-TERM INTENTIONS TO STAY IN SWEDEN

	Earnings	
	(1)	(2)
Ukraine × 2022	794.653***	
	(274.327)	
Ukraine × 2023	1087.357***	
	(365.886)	
Ukraine × 2024	821.119**	
	(322.834)	
Ukraine × 2022 × Low return	-529.880	
	(468.065)	
Ukraine × 2023 × Low return	304.452	
	(616.055)	
Ukraine × 2024 × Low return	210.789	
	(707.687)	
Fatalities 2022Q1 × 2022		234.940
		(352.411)
Fatalities 2022Q1 × 2023		263.881
		(519.207)
Fatalities 2022Q1 × 2024		708.189
		(585.985)
Fatalities 2022Q1 × 2022 × Low return		779.153
		(1123.418)
Fatalities 2022Q1 × 2023 × Low return		753.190
		(1327.217)
Fatalities 2022Q1 × 2024 × Low return		1013.676
		(1496.386)
Observations	194400	74340
Individuals (Ukraine)	8771	8771
Individuals (Control)	17348	17348
Mean (Ukraine)	26611.03	26611.03
Mean (Control)	25829.25	25829.25

Notes: This table examines heterogeneous treatment effects by legal residency status prior to the invasion. Individuals are classified based on their visa type in 2020: Swedish citizens (omitted category), work or student visa, and family reunion or other visa types. The omitted category is Swedish citizens. Column 1 shows the probability of filling at least one prescription for any mental health medication per quarter. Column 2 shows average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.28: EFFECTS AMONG THE NON-EMPLOYED

	Earnings (1)	Employment (2)	Multiple jobs (3)
Ukraine × 2022	1574.516***	4.110***	0.294
	(185.066)	(0.895)	(0.210)
Ukraine × 2023	2559.800***	6.805***	-0.095
	(247.595)	(1.192)	(0.315)
Ukraine × 2024	2370.903***	5.652***	
	(284.642)	(1.503)	
Ukraine × Unemployed 2021Q4 × 2022	524.847	2.390*	4.043***
	(351.131)	(1.261)	(0.711)
Ukraine × Unemployed 2021Q4 × 2023	522.289	2.570	3.398***
	(395.186)	(1.806)	(0.857)
Ukraine × Unemployed 2021Q4 × 2024	-468.552	-0.508	
	(478.207)	(1.907)	
Observations	173420	173420	138736
Individuals (Ukraine)	2513	2513	2513
Individuals (Control)	6158	6158	6158
Mean	4883.941	19.781	2.428
Mean (Ukraine)	5312.932	21.220	2.840
Mean (Control)	4708.876	19.194	2.259

Notes: This table further examines the distinction between active job seekers and individuals outside the labor force by restricting the sample to only these two groups. The sample excludes individuals who were employed in Q4 2021. *Unemployed* are individuals registered with the Public Employment Service in November 2021. The sample includes Ukrainian migrants and matched control migrants. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE A.29: EFFECTS ON RUSSIAN MIGRANTS

	Any drug (1)	Earnings (2)
Russia × 2022	0.48***	106.26
	(0.08)	(177.51)
Russia × 2023	0.43***	-102.50
	(0.11)	(269.69)
Russia × 2024	0.37***	-167.21
	(0.11)	(292.69)
Observations	1082000	1082000
Individuals (Russia)	18077	18077
Individuals (Control)	36023	36023
Mean (Russia)	7.89	26947
Mean (Control)	7.13	25741

Notes: This table examines effects on Russian migrants in Sweden using the same matched difference-in-differences design as the main analysis. Column 1 shows the probability of filling at least one prescription for any mental health medication per quarter. Column 2 shows average monthly earnings, measured in 2024 SEK value (100 SEK ≈ $11). All models control for individual and quarter fixed effects. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

Appendix B: External validity

B.1 Evidence from the American Community Survey

To assess whether the labor market patterns documented in Sweden generalize to other settings, we use data from the American Community Survey (ACS) for the years 2018–2024. The ACS is an annual cross-sectional survey covering approximately 1% of the U.S. population. We restrict the sample to foreign-born non-citizens and naturalized citizens who immigrated before 2019 and were of working age (14–64) in 2020. To avoid capturing spillover effects, we exclude migrants from Russia and countries sharing a border with Ukraine or Russia. The 2020 survey year is excluded due to data collection disruptions caused by the Covid-19 pandemic.

We estimate event-study specifications analogous to those in the main analysis, regressing labor market outcomes on interactions between a Ukrainian-origin indicator and year dummies, with country-of-origin and state-by-year fixed effects. Standard errors are clustered at the country-of-origin level.

Figure 4 displays the event-study results for three labor market outcomes. Panel A shows that Ukrainian expatriates in the United States experience a large and significant increase in annual earnings after the invasion, on the order of 3,000–4,000 SEK per month in PPP terms. Panel B shows weeks worked per year, which increase modestly but imprecisely. Panel C shows the probability of working 40 or more hours per week, which increases by approximately 1 percentage point in 2022 and 2024. Across all three outcomes, the pre-trends are reassuringly flat, with no evidence of diverging trajectories prior to the invasion.

Table B.1 presents the corresponding yearly difference-in-differences estimates. Earnings increase significantly in 2022 and 2023, with point estimates that remain positive but lose precision in 2024 as confidence intervals widen. The probability of working 40 or more hours per week increases significantly in 2022. Table B.2 shows that the composition of the Ukrainian sample does not change meaningfully after the invasion: there are no significant differences in age or years since immigration, though the sample becomes slightly more female and more educated in the post-period. Table B.3 shows that the earnings results are robust to the inclusion of individual-level covariates and to restricting the sample to a balanced set of origin countries.

These results are broadly consistent with the Swedish findings, showing that Ukrainian expatriates increased their labor supply following the invasion.

TABLE B.1: LABOR MARKET OUTCOMES: YEARLY ESTIMATES (ACS)

	Earnings	Weeks worked	Worked 40+ hours/week
	(1)	(2)	(3)
Ukraine × 2022	3980.47***	0.27	1.43***
	(1100.13)	(0.23)	(0.41)
Ukraine × 2023	4189.19***	0.18	0.53
	(1502.28)	(0.33)	(0.58)
Ukraine × 2024	3114.10	0.35	1.08*
	(2061.28)	(0.36)	(0.63)
Observations	1667117	1667117	1667117
Individuals (Ukraine)	14959	14959	14959
Individuals (Control)	1652158	1652158	1652158
Mean (Ukraine)	32411	37.12	57.36
Mean (Control)	26203	35.66	57.20

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on labor market outcomes among Ukrainian migrants in the United States, using data from the American Community Survey (ACS) 2018–2024 (excluding 2020). Column 1 shows monthly earnings in 2024 PPP SEK (100 SEK ≈ $11). Column 2 shows weeks worked per year. Column 3 shows the probability of usually working 40 or more hours per week (range: 0–100%). The sample consists of foreign-born individuals who immigrated before 2019. All specifications include country-of-origin and state-by-year fixed effects. Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE B.2: COMPOSITION CHANGES (ACS)

	Age	Years since immigration	Female	Citizen	Any college
	(1)	(2)	(3)	(4)	(5)
Ukraine × Post-invasion	-0.01	-0.07	0.20**	0.91	1.85***
	(0.10)	(0.12)	(0.08)	(0.88)	(0.14)
Observations	1667117	1667117	1667117	1667117	1667117
Individuals (Ukraine)	14959	14959	14959	14959	14959
Individuals (Control)	1652158	1652158	1652158	1652158	1652158
Mean (Ukraine)	40.45	18.49	54.52	72.07	72.27
Mean (Control)	42.61	20.87	51.73	52.02	50.58

Notes: This table tests for compositional changes in the Ukrainian migrant sample after the invasion using the American Community Survey (ACS) 2018–2024 (excluding 2020). Each column reports the coefficient on the interaction of being Ukrainian with a post-invasion indicator. Column 1: age; Column 2: years since immigration; Column 3: female (range: 0–100%); Column 4: U.S. citizen (range: 0–100%); Column 5: any college education (range: 0–100%). The sample is restricted to foreign-born individuals who immigrated before 2019. All specifications include country-of-origin and state-by-year fixed effects. Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * *p<0.1*, ** *p<0.05*, *** *p<0.01*.

TABLE B.3: LABOR MARKET OUTCOMES: ROBUSTNESS (ACS)

	Earnings			Weeks worked			Worked 40+ hours/week		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ukraine × 2022	3980.47***	3432.11***	3408.22***	0.27	0.07	0.06	1.43***	0.99**	1.00**
	(1100.13)	(1131.04)	(1232.08)	(0.23)	(0.22)	(0.25)	(0.41)	(0.42)	(0.46)
Ukraine × 2023	4189.19***	3813.77**	3853.69**	0.18	0.06	0.08	0.53	0.43	0.45
	(1502.28)	(1468.06)	(1598.42)	(0.33)	(0.32)	(0.36)	(0.58)	(0.58)	(0.64)
Ukraine × 2024	3114.10	2770.82	2617.31	0.35	0.24	0.22	1.08*	0.86	0.88
	(2061.28)	(2034.91)	(2209.93)	(0.36)	(0.35)	(0.38)	(0.63)	(0.61)	(0.67)
Observations	1667117	1667117	1537260	1667117	1667117	1537260	1667117	1667117	1537260
Individuals (Ukraine)	14959	14959	14959	14959	14959	14959	14959	14959	14959
Individuals (Control)	1652158	1652158	1522301	1652158	1652158	1522301	1652158	1652158	1522301
Mean (Ukraine)	32411	32411	32411	37.12	37.12	37.12	57.36	57.36	57.36
Mean (Control)	26203	26203	26040	35.66	35.66	35.72	57.20	57.20	57.39
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Balanced Sample	No	No	Yes	No	No	Yes	No	No	Yes

Notes: This table shows robustness checks for the ACS labor market estimates. For each outcome, three specifications are presented: (1) baseline with country-of-origin and state-by-year fixed effects; (2) adding individual-level covariates (years since immigration, gender, citizenship, and college education); (3) additionally restricting to a balanced sample of origin countries present in all survey years with at least 500 observations per year. Column 1–3: monthly earnings in 2024 PPP SEK (100 SEK ≈ $11). Columns 4–6: weeks worked per year. Columns 7–9: probability of usually working 40 or more hours per week (range: 0–100%). Mean values are measured during the pre-invasion period. Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

B.2 Evidence from the European Social Survey

While the ACS provides evidence on labor market outcomes, it does not contain information on mental health or subjective well-being. To assess whether the mental health effects documented in Sweden are also present in other countries, we use data from the European Social Survey (ESS), a cross-national survey conducted biennially across European countries since 2002. The ESS contains self-reported measures of happiness, life satisfaction, satisfaction with health, and self-rated health, which allow us to examine subjective well-being among Ukrainian expatriates across Europe.

We pool ESS rounds into five periods: 2015–16, 2017–18, 2019–21, 2022–23, and 2024. The sample consists of foreign-born migrants residing in European countries, excluding migrants and countries sharing a border with Ukraine or Russia. We restrict to host countries where Ukrainian migrants are observed in both the pre- and post-invasion periods, and require a minimum of three observations per group (Ukrainian versus other migrant) in each country-period cell. These restrictions yield a sample of approximately 830 migrants, of whom 186 are Ukrainian.

We construct an Anderson-style composite index of well-being from four measures: happiness (0–10), life satisfaction (0–10), satisfaction with health (0–10), and self-rated health (1–5). Each component is standardized using the control-group pre-invasion mean and standard deviation, weighted by the inverse of the covariance matrix of standardized components (estimated in the control-pre sample), and the resulting index is re-standardized to mean zero and unit standard deviation in the control-pre sample.[1]

We estimate event-study specifications regressing each outcome on interactions between a Ukrainian-origin indicator and period dummies, with the 2019–21 period as the base. All specifications control for age, gender, college education, years since immigration, citizenship in the host country, and host-country fixed effects. Standard errors are clustered at the country-of-origin level.

Figure B.1 displays raw means of each well-being measure by group and period. For happiness, life satisfaction, and the Anderson index, Ukrainian migrants track closely with other migrants prior to the invasion, then diverge sharply downward in 2022–23 and especially in 2024. The pattern for satisfaction with health is similar but noisier. Self-rated health shows a less clear pattern.

Figure B.2 displays the event-study estimates. Panel A shows that the composite well-being index declines by 0.29 standard deviations in 2022–23 and 0.56 standard deviations by 2024, with flat pre-trends. The individual components reveal that the effects are strongest for happiness (Panel B) and life satisfaction (Panel C), which decline by approximately 0.5 and 0.7 points in 2022–23, deepening to over 1 point by 2024. Satisfaction with health (Panel D) shows a significant decline in 2024, while self-rated health (Panel E) shows small and imprecise effects.

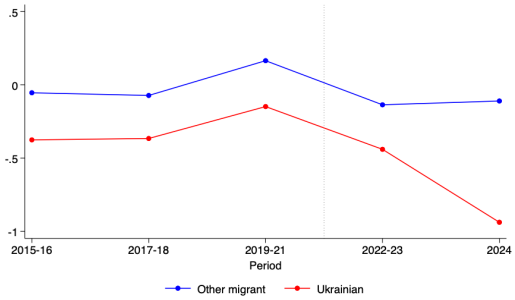
Table B.4 reports the corresponding pooled estimates. The Anderson index, happiness, life satisfaction, and satisfaction with health all show significant declines in 2022–23 that deepen in

[1] This follows the approach in Anderson (2008), which optimally combines multiple outcomes while accounting for their correlation structure.

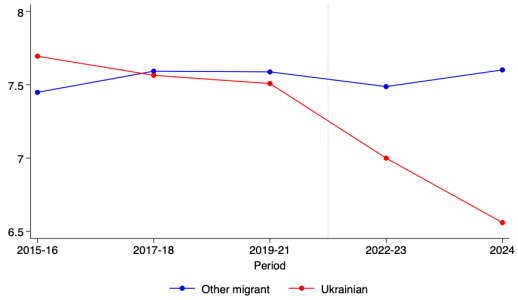
2024. The persistence and deepening of effects mirror the pattern observed for mental health prescriptions in Sweden, where anti-depressant use continues to rise through 2024.

These results complement our Swedish findings by showing that the deterioration in well-being among Ukrainian expatriates is not specific to one country or one measurement approach. While the ESS measures capture subjective well-being rather than clinical mental health, the consistency of results across self-reports and administrative prescription data strengthens the conclusion that the invasion caused meaningful and persistent harm to the well-being of Ukrainian expatriates.

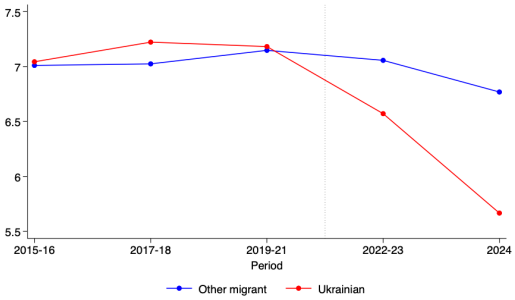
FIGURE B.1: RAW MEANS BY GROUP AND PERIOD (ESS)



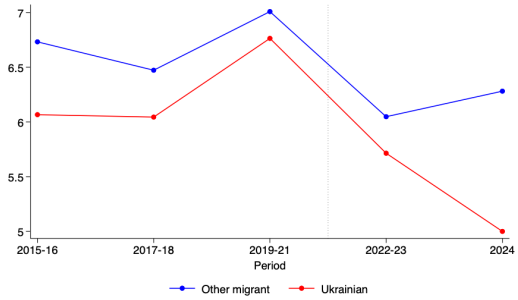
(A) ANDERSON WELL-BEING INDEX



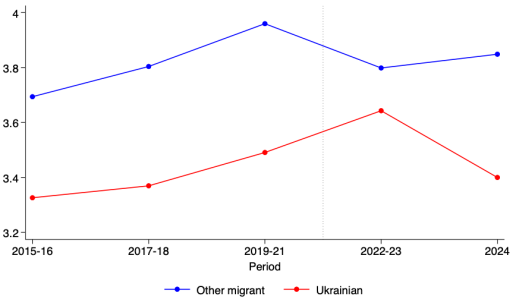
(B) HAPPINESS (0–10)



(C) LIFE SATISFACTION (0–10)



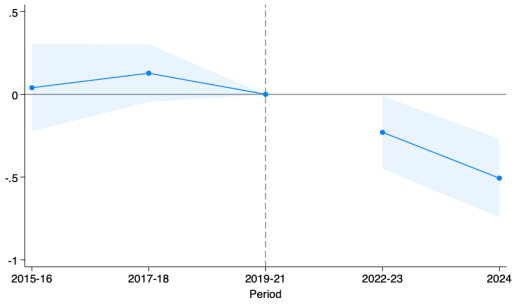
(D) SATISFACTION WITH HEALTH (0–10)



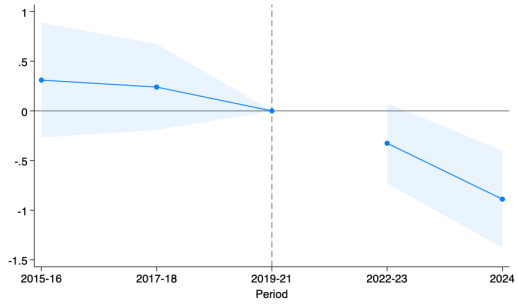
(E) SELF-RATED HEALTH (1–5)

Notes: This figure shows raw means of well-being measures for Ukrainian migrants (red) and other migrants (blue) across pooled ESS periods. Panel A shows the Anderson composite well-being index, constructed as an inverse-covariance-weighted average of standardized components (Panels B–E), with mean zero and unit standard deviation in the control-pre sample. Panels B–E show the individual components: happiness (0–10), life satisfaction (0–10), satisfaction with health (0–10), and self-rated health (1–5). The dotted vertical line indicates the boundary between the pre-invasion (2019–21) and post-invasion (2022–23) periods. The sample includes foreign-born migrants in ESS countries where Ukrainian migrants are observed in both pre- and post-invasion periods.

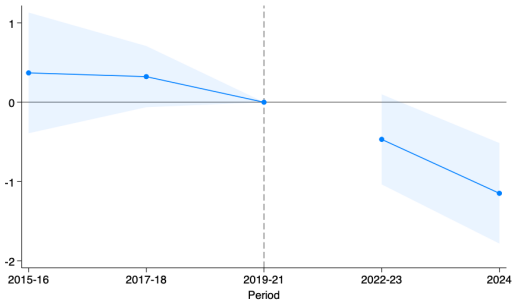
FIGURE B.2: EVENT-STUDY ESTIMATES: EUROPEAN SOCIAL SURVEY



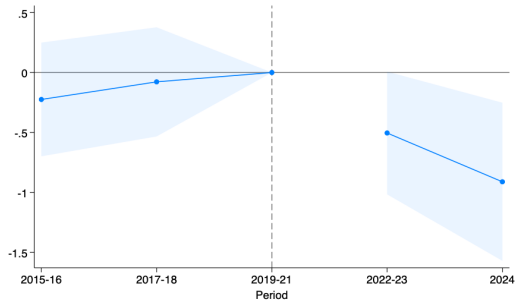
(A) WELL-BEING INDEX



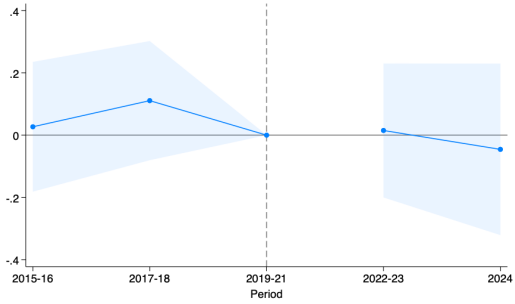
(B) HAPPINESS (0–10)



(C) LIFE SATISFACTION (0–10)



(D) SATISFACTION WITH HEALTH (0–10)



(E) SELF-RATED HEALTH (1–5)

Notes: This figure shows event-study estimates of the effect of the 2022 Russian invasion of Ukraine on self-reported well-being among Ukrainian migrants in Europe, using pooled data from the European Social Survey (ESS) rounds 8–11 (2015–2024). The base period is 2019–21. Panel A shows the Anderson composite well-being index (standardized to mean 0 and standard deviation 1 in the control-pre sample). Panels B–E show the individual components: happiness (0–10), life satisfaction (0–10), satisfaction with health (0–10), and self-rated health (1–5). All specifications control for age, gender, college education, years since immigration, host-country citizenship, and host-country fixed effects. Standard errors are clustered at the country-of-origin level. The vertical dashed line indicates the base period (2019–21). Standard errors clustered by country of origin. The shaded areas show the confidence intervals at the 95% level.

TABLE B.4: WELL-BEING OUTCOMES: ESS

	Well-being index (1)	Happiness (2)	Life satisfaction (3)	Satisfaction with health (4)	Self-rated health (5)
Ukraine × 2022-23	-0.285***	-0.506***	-0.695***	-0.409*	-0.032
	(0.079)	(0.152)	(0.198)	(0.234)	(0.087)
Ukraine × 2024	-0.564***	-1.058***	-1.363***	-0.826***	-0.094
	(0.100)	(0.164)	(0.279)	(0.280)	(0.110)
Observations	801	834	818	814	835
Observations (Ukraine)	182	186	184	184	186
Observations (Control)	619	648	634	630	649
Mean pre (Ukraine)	-0.286	7.585	7.151	6.324	3.401
Mean pre (Control)	-0.000	7.559	7.056	6.687	3.824

Notes: This table shows difference-in-differences estimates of the effect of the 2022 Russian invasion of Ukraine on self-reported well-being among Ukrainian migrants in Europe, using pooled data from the European Social Survey (ESS) rounds 8–11 (2015–2024). Column 1 shows the Anderson composite well-being index, constructed as an inverse-covariance-weighted average of the four standardized components (mean 0, standard deviation 1 in the control-pre sample). Columns 2–5 show the individual components: happiness (0–10), life satisfaction (0–10), satisfaction with health (0–10), and self-rated health (1–5). The sample includes foreign-born migrants in ESS countries where Ukrainian migrants are observed in both pre- and post-invasion periods, with a minimum of three observations per group in each country-period cell. All specifications control for age, gender, college education, years since immigration, host-country citizenship, period and host-country fixed effects. Mean values are measured during the pre-invasion period (2015–2021). Standard errors clustered by country of origin. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Appendix C: Conceptual Framework

C.1 Model

This appendix presents a simple model formalizing how home-country conflict affects expatriates' mental health and labor supply.

C.1.1 Setup

A migrant in the host country chooses labor supply $n \geq 0$ and transfers $T \geq 0$ to close ones remaining in the origin country. The migrant derives utility from consumption c, leisure $1 - n$, and the well-being of family in the origin country:

$$U = u(c) - \psi(n, m) + \gamma W(T, S, x), \tag{3}$$

where:

- $u(c)$ is utility from consumption, with $u' > 0$ and $u'' < 0$;
- $\psi(n, m)$ is the disutility of labor, depending on hours n and mental health m. We assume $\psi_n > 0$, $\psi_{nn} > 0$ and $\psi_{nm} < 0$ such that better mental health lowers the marginal disutility of work;
- $W(T, S, x)$ is family well-being, depending on transfers T, war intensity S, and exposure x (e.g., conflict intensity in the migrant's home oblast). We assume $W_T > 0$, $W_{TT} < 0$, and $W_S < 0$. Here, S captures aggregate wartime conditions that can reduce welfare even in relatively less exposed areas (e.g., disruption, inflation, uncertainty), while x captures idiosyncratic exposure that scales the impact of war on the family;[1]
- $\gamma > 0$ captures altruism toward family.

The budget constraint is $c + T = wn + y_0$, where w is the wage and y_0 is non-labor income.

C.1.2 The role of war

The invasion corresponds to an increase in S. This affects the migrant through two channels.

[1] We interpret S as the aggregate, time-varying conflict environment common to all expatriates (e.g., the post-invasion war period), and x as predetermined idiosyncratic exposure (e.g., conflict intensity in the migrant's home oblast); empirically, our identifying variation corresponds to heterogeneity in responses to the common shock through the interaction $S \times x$.

Mental Health Channel. War reduces mental health: $m = m(S, R, x)$ with $m_S \equiv \partial m/\partial S < 0$. We allow mental health to depend on local refugee arrivals R; the sign of m_R is an empirical question. In one scenario $m_R > 0$ if arrivals yield opportunities to find meaning and comfort among conationals; in another, $m_R \leq 0$ if arrivals increase stress through congestion, discrimination, or trauma reminders. We also allow the mental-health shock to be larger for migrants with higher exposure x, i.e. $m_{Sx} \equiv \partial^2 m/(\partial S \partial x) < 0$.

Mental health deterioration increases the marginal disutility of work:

$$\frac{\partial \psi_n}{\partial S} = \psi_{nm}\, m_S > 0 \tag{4}$$

since $\psi_{nm} < 0$ and $m_S < 0$.

Financial Need Channel. War reduces family baseline welfare ($W_S < 0$) and raises the marginal value of transfers:[2]

$$W_{TS} \equiv \frac{\partial^2 W}{\partial T \partial S} > 0. \tag{5}$$

This cross-partial captures increased need due to lost income, displacement, or destruction of assets. We also allow exposure heterogeneity:

$$W_{TSx} \equiv \frac{\partial^3 W}{\partial T \partial S \partial x} > 0, \tag{6}$$

so that the marginal value of transfers rises more for migrants from harder-hit regions.

C.1.3 Optimal Choices

The migrant chooses n and T to maximize utility. Substituting the budget constraint $c = wn + y_0 - T$, the first-order conditions are:

$$[n]: \quad wu'(c) = \psi_n\big(n, m(S, R, x)\big) \tag{7}$$

$$[T]: \quad u'(c) = \gamma W_T(T, S, x). \tag{8}$$

To analyze how optimal labor supply n^* responds to S, allowing transfers to adjust endogenously, we differentiate the system (7)–(8). Define

$$F_1(n, T; S, R, x) \equiv wu'(c) - \psi_n\big(n, m(S, R, x)\big) = 0, \tag{9}$$

$$F_2(n, T; S, x) \equiv u'(c) - \gamma W_T(T, S, x) = 0, \tag{10}$$

[2] Even when exposure x is low, higher war intensity S can reduce family welfare through aggregate disruptions (e.g., prices, labor-market shocks, displacement risk), so the transfer motive can increase with S for all migrants, while exposure x governs how strongly need rises with the war.

with $c = wn + y_0 - T$. Differentiating $(F_1, F_2) = (0, 0)$ with respect to S yields:

$$\begin{pmatrix} F_{1n} & F_{1T} \\ F_{2n} & F_{2T} \end{pmatrix} \begin{pmatrix} dn^*/dS \\ dT^*/dS \end{pmatrix} = - \begin{pmatrix} F_{1S} \\ F_{2S} \end{pmatrix}. \tag{11}$$

The derivatives are:

$$F_{1n} = w^2 u''(c) - \psi_{nn}(n, m), \tag{12}$$
$$F_{1T} = -w u''(c), \tag{13}$$
$$F_{1S} = -\psi_{nm}(n, m)\, m_S(S, R, x), \tag{14}$$
$$F_{2n} = w u''(c), \tag{15}$$
$$F_{2T} = -u''(c) - \gamma W_{TT}(T, S, x), \tag{16}$$
$$F_{2S} = -\gamma W_{TS}(T, S, x). \tag{17}$$

Solving for dn^*/dS (Cramer's rule) gives:

$$\frac{dn^*}{dS} = \frac{\overbrace{F_{1T}F_{2S}}^{\text{financial need}} - \overbrace{F_{2T}F_{1S}}^{\text{health cost}}}{\Delta}, \qquad \Delta \equiv F_{1n}F_{2T} - F_{1T}F_{2n}. \tag{18}$$

The two terms in the numerator correspond to the two channels:

- **Financial need.** Since $u'' < 0$, we have $F_{1T} = -w u''(c) > 0$. Since $W_{TS} > 0$, we have $F_{2S} = -\gamma W_{TS} < 0$. Thus $F_{1T}F_{2S} < 0$: war raises the marginal value of transfers, increasing the incentive to work.
- **Health cost.** Since $\psi_{nm} < 0$ and $m_S < 0$, we have $F_{1S} = -\psi_{nm} m_S < 0$. Under concavity, $F_{2T} = -u'' - \gamma W_{TT} > 0$. Thus $F_{2T}F_{1S} < 0$, so the term $-F_{2T}F_{1S} > 0$: worsening mental health raises the marginal disutility of work, reducing labor supply.

The overall sign of dn^*/dS is therefore ambiguous: war can increase or decrease labor supply depending on which force dominates. Let $V(n, T) = u(wn + y_0 - T) - \psi(n, m) + \gamma W(T, S, x)$. Under our curvature assumptions ($u'' < 0$, $\psi_{nn} > 0$, $W_{TT} < 0$) and the usual second-order condition for a unique interior optimum (negative definiteness of the Hessian of V), the system is locally well-behaved and $\Delta \neq 0$.[3]

Exposure heterogeneity. Since $W_{TSx} > 0$, the magnitude of $F_{2S} = -\gamma W_{TS}$ is larger for migrants with higher exposure x, strengthening the financial-need component of the response. In addition, if $m_{Sx} < 0$, then the mental-health shock is larger for higher-exposure migrants, strengthening the health-cost component of the response through $F_{1S} = -\psi_{nm} m_S(S, R, x)$. Thus exposure can amplify both channels, and the net effect on labor supply remains empirically determined.

[3] In particular, $\Delta = -\det(\nabla^2_{(n,T)} V)$, so strict concavity implies $\Delta < 0$.

C.1.4 Reservation Wages

We next evaluate how the reservation wage—the minimum wage at which the migrant supplies positive labor—responds to war. At $n = 0$, the labor-supply FOC becomes

$$\bar{w}\, u'(c_0) = \psi_n(0, m(S, R, x)), \tag{19}$$

where $c_0 = y_0 - T_0$ and T_0 solves the transfer FOC at $n = 0$. Using (8) at $n = 0$, $u'(c_0) = \gamma W_T(T_0, S, x)$, so

$$\bar{w} = \frac{\psi_n(0, m(S, R, x))}{\gamma W_T(T_0, S, x)}. \tag{20}$$

War affects both numerator and denominator. The numerator increases if mental health deteriorates (since $\psi_{nm} < 0$). The denominator increases if family need rises (since $W_{TS} > 0$ increases W_T), and more so if the family's exposure is greater, as $W_{TSx} > 0$. If the denominator effect dominates, reservation wages fall.

C.1.5 Extension: Treatment, Access, and What Prescriptions Measure

To connect the framework to prescription-based outcomes, it is useful to separate latent symptom burden from observed treatment. Let b denote latent symptom burden (higher b = worse functioning), and write mental health as $m = \bar{m} - b$. War increases burden: $b = b(S, R, x)$ with $b_S > 0$. We allow the burden shock to be larger for migrants with higher exposure x, i.e. $b_{Sx} \equiv \partial^2 b/(\partial S \partial x) > 0$.

Observed antidepressant use D depends on both need and healthcare access A:

$$D = \mathbf{1}\{b \geq \bar{b}(A)\}, \qquad \bar{b}'(A) < 0, \tag{21}$$

so that better access lowers the burden threshold at which treatment is initiated. This implies that prescriptions can rise after the invasion either because latent burden increases (higher b) or because access improves (lower $\bar{b}(A)$), or both.

If treatment intensity τ mitigates burden (so $b_\tau < 0$) and access increases feasible treatment intensity, then access can also attenuate the impact of war on functioning and, through $\psi(n, m)$, on labor supply. This yields a testable implication: relationships between conflict exposure, prescriptions, and labor-market outcomes may differ by proxies for healthcare access, while prescription-based outcomes should be interpreted as a joint object reflecting both latent burden and care access.

C.1.6 Empirical Predictions

The model yields five predictions that map to our empirical design:

1. **Mental health deteriorates on average.** War increases latent burden b (lowers m), raising mental-health-related outcomes in the population.

2. **Labor supply effects depend on relative magnitudes.** Labor supply may rise or fall depending on whether the financial-need channel dominates the health-cost channel in (18).

3. **Labor supply increases are concentrated among high-exposure migrants when the provision motive dominates.** Since $W_{TSx} > 0$, the financial-need channel strengthens with exposure x. The health-cost channel also strengthens with exposure ($m_{Sx} < 0$), but if the provision motive dominates, labor supply and earnings respond more strongly for higher-exposure migrants.

4. **Refugee arrivals can moderate mental health effects.** The sign of m_R is ambiguous a priori, making the direction of moderation an empirical question.

5. **Healthcare access shapes observed prescriptions and functioning.** Better access A increases observed treatment conditional on burden and may attenuate the burden-to-work link if treatment mitigates symptoms.

C.1.7 Discussion

This framework clarifies why deteriorating mental health and increasing labor supply can coexist. The war simultaneously imposes psychological costs (through m) and raises the value of earnings for supporting family (through W_T).[4] When the provision motive dominates, migrants increase labor supply—accepting lower reservation wages and secondary jobs—even as their mental health worsens.

Why exposure gradients may decay over time. Although higher exposure x can amplify the initial mental-health shock (e.g., $m_{Sx} < 0$), the difference in observed outcomes across exposure groups need not persist. First, psychological responses may partially adapt as uncertainty resolves and contact with family stabilizes, implying that the incremental effect of x on m attenuates over time even if average distress remains elevated. Second, prescription-based measures reflect both latent burden and treatment initiation: if high-x individuals enter treatment sooner after the shock, while lower-x individuals initiate treatment with delay, then the gap in observed prescriptions can close over time even when latent symptom burden remains different. More generally, as treatment and access saturate, observed prescription flows may converge mechanically, so fading exposure gradients in prescriptions are consistent with either true convergence in latent distress or convergence in treatment uptake. Formally, one can interpret $m(S, R, x, t)$ as partially adjusting over time, with $\partial m/\partial t > 0$ after the shock and $\partial^2 m/(\partial S\, \partial x)$ moving toward zero as t increases.

[4] Our framework models the financial need channel through family welfare, but a related mechanism may also operate. Migrants may own assets in the origin country—property, savings, or business interests—whose value is directly diminished by conflict. This represents a negative wealth shock to the migrants themselves, not only to family members requiring support. The labor supply implications are similar: reduced lifetime wealth increases the marginal utility of earnings, reinforcing the financial need channel we emphasize. We note this possibility as a complementary mechanism that our reduced-form estimates may partially capture.

The welfare implications are nuanced. Mental health deterioration is clearly costly. To the extent that the labor-supply response reflects adjustments to changed circumstances—migrants valuing support for their families and increasing work effort accordingly—it need not represent an additional welfare loss in itself. Under this interpretation, the primary welfare costs of the war operate through mental health and family well-being rather than through the behavioral response per se.

We note several limitations. The model is static and does not capture the dynamics of mental health deterioration or recovery. It abstracts from labor demand and assumes migrants can freely adjust hours. It also treats healthcare access as the binding constraint rather than modeling treatment choice and costs explicitly. Despite these simplifications, the framework provides a structure for interpreting our empirical findings.

Appendix D: Extensions

D.1 QALY-Equivalent Burden from Prescription Prevalence

To place the mental health effects in a welfare framework comparable to other health interventions, we translate our estimates into Quality-Adjusted Life Years (QALYs)—a standard metric used in health economics to combine morbidity and mortality into a single index of disease burden. We translate the estimated increase in quarterly prescription prevalence into (i) additional treated person-time, (ii) a QALY-equivalent burden using WHO/GBD disability weights, and (iii) an illustrative monetized benchmark. The calculation maps *prescription-linked person-time* into QALYs under standard burden-of-disease weights. It is not intended to recover clinical prevalence or severity, and the direction of any discrepancy between prescription-linked burden and underlying symptom burden is ambiguous (e.g., changes in access, help-seeking, prescribing norms, and treatment effectiveness may also affect observed pickups).

Inputs

Prevalence effects (quarterly, pp). Let τ_j denote the estimated effect on the probability of at least one prescription pickup in a given quarter (percentage points). From Table XX:

- Any mental-health drug: $\tau = 0.930$ pp
- Immediate-only: $\tau_{imm} = 0.202$ pp
- Antidepressant-only: $\tau_{ad} = 0.479$ pp
- Both: $\tau_{both} = 0.249$ pp

These components sum to the total: $0.202 + 0.479 + 0.249 = 0.930$ pp. We interpret immediate-relief drugs (benzodiazepines, Z-drugs) as a proxy for anxiety/insomnia and antidepressants as a proxy for depression.

Sample and horizon. Ukrainian sample size $N = 8{,}771$. Post-period length $T = 12$ quarters (2022Q1–2024Q4). Pre-period mean of "any drug": 5.60% (for context). The implied relative increase is $0.93/5.60 \approx 16.6\%$.

Episode lengths (quarters; for interpretation only). Mean episode durations among Ukrainians (in the estimation sample):

$$D_{imm} = 2.112, \qquad D_{ad} = 3.339, \qquad D_{both} = 2.414.$$

These allow us to express prevalence effects as implied episode counts; they do not affect person-time or QALY totals.

Disability weights (WHO/GBD). We use WHO/GBD disability weights for common mental disorders (World Health Organization, 2024). Baseline (moderate severity):

$$DW_{anx} = 0.133, \quad DW_{dep} = 0.396.$$

For individuals on both drug types, we apply the standard multiplicative combination rule:

$$DW_{both} = 1 - (1 - DW_{anx})(1 - DW_{dep}) = 0.476.$$

Step 1: Convert Quarterly Prevalence Effects to Person-Years

For category j, the additional treated person-years over T quarters is:

$$PY_j = \frac{(\tau_j/100) \cdot N \cdot T}{4}.$$

Numerically:

$$\begin{aligned} PY_{imm} &= 53.15, \\ PY_{ad} &= 126.04, \\ PY_{both} &= 65.52, \end{aligned}$$

summing to $PY_{total} = 244.71$ person-years. Per capita, this is $244.71/8771 = 0.0279$ years, or about 10.2 days of treated time over the three-year window.

Step 2: QALY-Equivalent Burden

Applying the disability weights:

$$\begin{aligned} QALY &= PY_{imm} \cdot DW_{anx} + PY_{ad} \cdot DW_{dep} + PY_{both} \cdot DW_{both} \\ &= 53.15 \times 0.133 + 126.04 \times 0.396 + 65.52 \times 0.476 \\ &= 7.07 + 49.91 + 31.21 = 88.19. \end{aligned}$$

Baseline total: 88.2 QALYs over 12 quarters.

This corresponds to $88.2/8771 = 0.0101$ QALYs per person, or approximately 3.7 days of perfect health lost per Ukrainian expatriate over the three-year post-invasion period.

Sensitivity to severity assumptions. Table D.1 reports QALY estimates under alternative severity assumptions.

Antipsychotic Prescriptions

Table A.7 documents effects on antipsychotic prescriptions that are concentrated in 2022 and attenuate thereafter:

- 2022: $\tau_{ap,2022} = 0.083$ pp ($p < 0.01$)

TABLE D.1: QALY ESTIMATES BY SEVERITY ASSUMPTION

Severity	DW_{anx}	DW_{dep}	DW_{both}	QALYs
Mild	0.030	0.145	0.171	31.1
Moderate (baseline)	0.133	0.396	0.476	88.2
Severe	0.523	0.658	0.837	165.6

Notes: Disability weights from WHO Global Health Estimates (World Health Organization, 2024). Combined weights use the multiplicative rule $DW_{both} = 1 - (1 - DW_{anx})(1 - DW_{dep})$.

- 2023: $\tau_{ap,2023} = 0.049$ pp (n.s.)
- 2024: $\tau_{ap,2024} = 0.050$ pp (n.s.)

Using year-specific effects, the implied person-years are:

$$PY_{ap} = 0.00083 \times 8771 + 0.00049 \times 8771 + 0.00050 \times 8771 = 15.96 \text{ person-years.}$$

Antipsychotics are prescribed for a range of conditions (e.g., schizophrenia, bipolar disorder, treatment-resistant depression). Because the appropriate disability weight is uncertain, we present an illustrative sensitivity range:

$$QALY_{ap} \in [15.96 \times 0.30,\ 15.96 \times 0.50,\ 15.96 \times 0.70] = [4.8,\ 8.0,\ 11.2].$$

This estimate should be interpreted cautiously: the effect is transient (statistically significant only in 2022), and there may be partial overlap with the main mental-health drug categories. We therefore report antipsychotics separately rather than adding them to the baseline total.

Episode-Based Representation

The prevalence effects can equivalently be expressed as implied new episodes:

$$Episodes_j = \frac{(\tau_j/100) \cdot N \cdot T}{D_j}.$$

Using the duration means:

$$Episodes_{imm} = 100.7, \qquad Episodes_{ad} = 151.0, \qquad Episodes_{both} = 108.6.$$

This representation is algebraically equivalent to the person-time approach: $Episodes_j \times D_j = (\tau_j/100) \cdot N \cdot T$ by construction. The episode counts provide an intuitive sense of scale—roughly 360 additional treatment episodes across the three drug categories.

Monetization (Benchmark)

Sweden does not apply a single official SEK/QALY threshold. Empirical analyses of TLV reimbursement decisions estimate implied decision boundaries around SEK 702,000/QALY for non-severe conditions and SEK 988,000/QALY for severe conditions (Svensson et al., 2015; Dental and Pharmaceutical Benefits Agency , TLV). Using SEK 700,000/QALY as an illustrative benchmark:

$$\text{Monetized cost} = 88.2 \times 700{,}000 = 61.7 \text{ million SEK}.$$

Table D.2 summarizes the main estimates.

Table D.2: Summary: QALY-Equivalent Burden

Measure	Estimate
Person-time (treated)	
Additional person-years	244.7
Per capita (days)	10.2
QALY burden (treated only)	
Mild severity	31.1
Moderate severity (baseline)	88.2
Severe	165.6
Antipsychotics (separate; sensitivity)	
DW_{ap} = 0.30/0.50/0.70	4.8 / 8.0 / 11.2
Monetization (SEK 700,000/QALY)	
Treated only (baseline)	61.7M SEK

Sensitivity to Treatment Rate Assumptions

The baseline estimate of 88.2 QALYs captures prescription-linked treated person-time. International evidence suggests that a substantial fraction of individuals with common mental disorders receive no treatment (Andrade et al., 2014). The total burden depends on (i) the treatment rate and (ii) the severity distribution among the untreated. We therefore present scenario-based extrapolations that are *not identified* by our data.

Let Q^{obs} denote the treated-only burden (baseline: $Q^{obs} = 88.2$), and let r denote the treatment rate. Let k denote the ratio of mild-to-baseline burden from Table D.1, $k = Q^{mild}/Q^{baseline} \approx 31.1/88.2 \approx 0.353$. Under each scenario:

[label=A.]

1. **Same severity.** Untreated individuals have the same severity distribution as treated:

$$Q(r) = \frac{Q^{obs}}{r}.$$

2. **Milder severity.** Untreated individuals have mild severity (relative burden factor k):

$$Q(r) = Q^{obs}\left[1 + \frac{1-r}{r}\,k\right].$$

3. **Treatment efficacy (30%).** Treatment reduces disability by 30%, so the observed treated-only burden Q^{obs} reflects 70% of the underlying burden among treated. We assume untreated individuals bear this full underlying burden:

$$Q(r) = Q^{obs} + \frac{Q^{obs}}{0.7}\,\frac{1-r}{r}.$$

4. **Conservative.** Only half of implied untreated cases represent clinically significant deterioration, and those cases are mild:

$$Q(r) = Q^{obs}\left[1 + \frac{1-r}{r}\,\frac{1}{2}k\right].$$

Table D.3: QALY Estimates Under Alternative Treatment Rate Assumptions

	Treatment Rate			
Scenario	70%	60%	50%	40%
Observed (treated only)	88.2	88.2	88.2	88.2
A: Untreated = same severity	126.0	147.0	176.4	220.5
B: Untreated = mild severity	101.5	108.9	119.3	134.8
C: + Treatment efficacy (30%)	142.2	172.2	214.2	277.2
D: Conservative	94.9	98.6	103.7	111.5

Notes: All values in QALYs. Scenario definitions are given in the text. Baseline treatment-rate benchmark of 50% is drawn from Andrade et al. (2014).

Interpretation and Caveats

This exercise quantifies the QALY-equivalent burden *consistent with observed prescription-linked person-time* under standard disability weights. Prescription pickups are not a direct measure of underlying symptoms or diagnoses. Changes in access, help-seeking, prescribing norms, and treatment effectiveness may affect measured prevalence, so these estimates should be interpreted as a treatment-linked response rather than a complete measure of underlying mental health burden.

The mapping from drug categories to WHO/GBD disability weights involves judgment; the severity sensitivity analysis spans a wide range (31–166 QALYs for treated cases), reflecting this uncertainty. Antipsychotic effects may partially overlap with the main mental-health drug categories; we therefore report antipsychotics separately rather than adding them to the baseline total. Finally, we assume constant disability weights over the episode duration; if disability changes

over time (e.g., due to symptom dynamics or treatment response), the fixed-weight mapping may overstate or understate the underlying symptom burden depending on timing and adherence.