Research paper

The impact of EU enlargement on immigrants' mental health

Andrea Berlanda [a,1], Elisabetta Lodigiani [a,c,1], Elisa Tosetti [a,*,1], Giorgio Vittadini [b,1]

[a] *University of Padua, Department of Economics and Management, Italy*
[b] *University of Milan Bicocca, Department of Statistics, Italy*
[c] *LdA, University of Milan, Italy*

ARTICLE INFO

ABSTRACT

In this paper[2] we explore the impact of the 2007 European Union enlargement to Romania and Bulgaria on the mental health of documented immigrants from these countries who arrived in Italy before 2007. Using data from a unique administrative data set for the Italian Lombardy region and by employing a difference-in-differences individual fixed effect estimator, we find that this enlargement caused a significant improvement in the mental health of young male immigrants. To shed light on the mechanisms behind these results, we use data from a unique survey administered in the Lombardy region and show that the enlargement mitigates sources of health concerns and increases income and employment stability through permanent job contracts for young male immigrants. Overall, these findings suggest that enhanced labour market conditions due to enlargement may lead to a subsequent important decrease in psychological distress among immigrants.

1. Introduction

Migrants in host countries often face significant challenges related to their health and mental well-being. Factors such as cultural adjustment, language barriers, labour market instability, and social isolation can contribute to or exacerbate mental health problems among migrants. Adequate healthcare support and policies that address these unique needs are crucial to ensure the health and welfare of immigrant populations. Some recent studies have focused on the effects of legalisation policy as a tool to integrate immigrants by considering its impact on labour market conditions (e.g., Devillanova et al., 2018), with significant consequences for migrants' physical and mental health (e.g., Giuntella and Lonsky, 2020). However, to the best of our knowledge, little is known about the impact of policies that stimulate a reduction in uncertainty regarding residency and work rights even among documented immigrants.

In this paper, we study the effect of the 2007 EU enlargement to Romania and Bulgaria on the mental health of documented migrants from these countries who arrived in Italy before 2007. After EU accession, the new legal framework acted as a permanent work permit for both legal and illegal immigrants. For undocumented migrants, EU access acted as a pathway to legalisation, offering the possibility of entering the formal economy and escaping the constant threat of deportation. On the other hand, for legal immigrants, EU access implied the right to reside and work without the requirement of any permit, thus simplifying administrative procedures. One of the first important contributions of this paper is to investigate the impact of EU enlargement on a number of

objective measures of mental health and well-being. Specifically, using a large administrative data set that contains information on all individuals residing in the Lombardy region and the health care services they receive, we construct several objective measures of mental health using medical prescriptions.

Prescriptions are particularly well suited for analysis since they reflect diagnoses made by medical professionals, making them a notably more reliable source of information than self-reported measures of health (Rocco et al., 2018). Employing a difference-in-differences approach, we compare the mental health status of individuals from new member states (Romania and Bulgaria) with that of individuals from other candidate countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia, and Turkey) before and after the enlargement. We find that EU enlargement significantly reduces the mental health problems of Romanians and Bulgarians in the Lombardy region of Italy. The reduction in uncertainty for future prospects in the country of destination due to the EU enlargement and the consequent rights to reside and work may have positive effects on the mental health of immigrants from accession countries. One important channel through which we expect that their mental health improves is the so-called "labour market channel", in which a gradual increase in employment stability due to, for example, to a higher probability of receiving permanent job contracts will reduce uncertainty about future labour income and have positive effects on the mental health of workers. In addition, EU enlargement has the potential to foster social integration and inclusion. The common labour and human rights standards that apply to all member states protect workers from exploitation and discrimination in the workplace. This, in turn, may reduce anxiety and stress among migrant workers. In our empirical analysis, we focus on adult individuals of working age, categorised by gender and age. We show that EU enlargement leads to a decrease in psychological distress, which translates to a decrease in psychotropic medication use. Our results especially hold for young males, who could be particularly exposed to work-related shocks relative to older workers. Indeed, young workers have been the most affected by the increase in temporary employment since the late 1990s, with males being particularly sensitive to the issue of job insecurity due to their traditional role as breadwinners (e.g., Carrieri et al., 2014).

Another important contribution of this paper is to look at the mechanisms that may drive these findings. To test the labour market channel, we complement our analysis using data from a unique survey run by the Institute for Multiethnic Studies (ISMU) on a representative sample of the entire immigrant population of the Lombardy region, which provides detailed information on their labour market outcomes, including the sector of employment (informal/formal), the types of employment contracts, and other characteristics. This information allows us to shed light on the labour market mechanisms through which the extension of EU citizenship affects the mental health of immigrants from accession countries. Our results show that EU enlargement increases income and employment stability through permanent job contracts for legal young male immigrants, while females display a positive and slightly statistically significant effect on the likelihood of being employed. ISMU data also allow us to investigate, in selected waves, the impact of the enlargement on sources of health concerns. These findings complement our analysis with subjective well-being measures. In line with previous results, we find that EU enlargement is associated with an increase in the probability of no sources of concern. Additionally, we find a decrease in concerns related, among others, to working conditions and poverty. Furthermore, our results indicate a reduction in homesickness among migrants, which is potentially associated with improved ease of travel to their home country and the facilitation of family reunification. Again, these results especially hold for young males.

Italy provides an ideal context to study the effects of the 2007 enlargement, as it has long been one of the main destinations for both Romanians and Bulgarians, even before 2007. In fact, Italy was the second destination (after Germany) for Romanians and the fourth destination (after Spain, Germany, and Greece) for Bulgarians among the main Western European countries in 2000.[2] More specifically, we focus on Lombardy, which was the first destination for Bulgarians and the third for Romanians among all regions of Italy,[3] and it is one of largest, most populated, wealthiest Italian regions, accounting for 23% of the entire migrant population legally residing in the country in 2005 (Dustmann et al., 2017). Furthermore, although the EU accession of Romania and Bulgaria was an expected event, its labour market consequences in Italy were not, and the EU accession unexpectedly implied full rights to work for Romanians and Bulgarians.

Our study adds to the literature that examines the effects of EU enlargement on immigrants. Using ISMU data for the Lombardy region, Adamopoulou and Kaya (2020) studied the effect of the 2007 EU enlargement on the consumption behaviour of immigrant households. The authors find that the enlargement induced a significant increase in consumption behaviour due to increased employment opportunities for both undocumented and documented immigrants: previously undocumented immigrants experienced an increase in labour income by moving from the informal to the formal economy, whereas documented immigrants benefited from the increased probability of obtaining a permanent contract. Mastrobuoni and Pinotti (2015) exploit the same natural experiment in Italy and find that immigrant crime decreased due to increased employment opportunities, especially for undocumented immigrants. Adda et al. (2020), exploiting the enlargements of the EU that occurred between 2004 and 2007, analyse the effects of enlargements on the marriage market in Italy via the legalisation effect. To the best of our knowledge, previous literature has not explored the effects of EU enlargement on the mental health of (legal) immigrants. These effects may be in part explained by the (previously documented) labour market channel.

A number of studies have analysed the impact of the labour market and contractual conditions on mental health, mostly using self-reported health measures. Carrieri et al. (2014) investigated the effect of non-permanent jobs on a set of physical and mental health and happiness measures in Italy. Using a propensity score matching approach, the authors find a negative effect of temporary

---

contracts on psychological well-being that is particularly strong for young male workers. Using data from the UK, Robone et al. (2011) investigated the influence of contractual and working conditions on the self-assessed health and psychological well-being of employees. The results indicate that both contractual and working conditions affect health and psychological well-being, although differences exist between women and men. Using similar data, Dawson et al. (2015) studied the association between temporary and permanent employment and three indicators of mental health (psychological distress, psychological anxiety, and life satisfaction) and found that permanent employees who move to temporary employment have poorer mental health than those who never become temporarily employed. Pirani (2017) explored the association between the type of job contract and four domains of mental health, namely, vitality, social functioning, role emotional, and general mental health, in Italy. The results show that all the forms of atypical work considered are associated with lower levels of general mental health than permanent full-time employment. Reichert and Tauchmann (2017) investigated the relationship between workforce reduction and mental health using German data. The authors found that workforce reduction has a negative impact on the mental health of employees and point to subjective job insecurity as an important channel for this effect. Recently, Belloni et al. (2022) investigated the impact of working conditions on mental health for a sample of British workers, where working conditions are measured in terms of physical environment, work intensity, working time quality, skills and discretion, and job prospects. The results indicate that improvements in working conditions have a significant and beneficial impact on depressive symptoms, mostly for female workers.

Among these studies, very few have conducted empirical analyses using health administrative data, as in our case. Moscone et al. (2016) explored the impact of precarious employment on psychotropic medication prescription in Italy from 2007 to 2011. The results show that the probability of psychotropic medication prescription is greater for workers under temporary job contracts and that more days of work under temporary contracts and more changes in temporary contracts significantly increase psychotropic medication prescription.

In a closely related literature that analyses the health effects of job loss, Rocco et al. (2018) investigated the effect of job loss on the probability that (long-tenured) workers are prescribed antihypertensive and psychotropic drugs in Italy, using administrative data on pharmaceutical prescriptions for the years between 2007 and 2012. The results show that the probability of drug prescription increases among males under 40 years old but not among older males or female workers. One possible reason for this result is the greater vulnerability to work-related shocks among young male workers than women. Similarly, Kuhn et al. (2009) studied the consequences of job loss on a number of health cost measures in Austria from 1998 to 2002. The results indicate that while overall expenditure on medical treatments is not strongly affected by job displacement, job loss significantly increases expenditures for psychotropic drugs, as well as for hospitalisations due to mental health problems for men.

Our study is also linked to the recent literature on the relationship between legalisation policy and the physical and mental health of immigrants. Giuntella and Lonsky (2020) analysed the effects of the 2012 Deferred Action for Childhood Arrivals (DACA) on several health-related outcomes, such as health insurance coverage, access to care, health care use, and health outcomes in the U.S. Their estimates suggest that among those living below the poverty level, those eligible for DACA improved their self-reported health and reduced their depression symptoms, anxiety, distress, and hypertension. They claim that their results may be in part explained by the positive effects on labour market outcomes due to temporary work authorisations. In a related paper, Giuntella et al. (2021) also found evidence that DACA significantly improves the duration and quality of immigrants' sleep, at least in the short term. While these studies focus on the (temporary) legalisation process, our analysis, given the administrative nature of our data, refers mainly to documented immigrants. This implies, first, that our results could be interpreted as a lower bound, as we would expect stronger effects for undocumented immigrants who benefit from legalisation. Second, they imply that even for already documented immigrants, permanent residency may lead to better labour market outcomes with important effects on mental health.

The remainder of the paper is structured as follows. In Section 2, we briefly discuss the Italian legal framework and the EU enlargement process. In Section 3, we introduce the data, while in Section 4, we describe our empirical approach. Finally, in Sections 5 and 6, we discuss the empirical results. Section 7 concludes.

2. Institutional framework

Legal framework conditions to work and live in Italy differ for non-EU and EU citizens, as only the former are subject to the provisions of the so-called Consolidated Law on Immigration.

According to this law, the admission of immigrants from extra EU countries is regulated by a rigid quota system. Each year, the so-called "Flows Decree" sets stringent limits on the number of work permits available by the type of contract and province.

Applicants are required to submit job offers from prospective employers. Successful work permit applicants can legally reside in Italy, and their spouse and children are eligible to obtain a residence permit for the purpose of family reunion. The temporary residence permit for work reasons is valid for two years for immigrants working under a permanent contract, one year for those working under a fixed-term (temporary) contract, and a maximum of nine months for seasonal workers.[4] Permits can generally be renewed, although this is usually subject to satisfying certain conditions, such as earning a high enough income and not engaging in criminal activity.

Until 2012, foreign workers who had their job contracts terminated had six months to secure new employment. Failure to do so meant they had to leave the country, rendering them undocumented.[5] After five years of legal residency in Italy (with no more

---

[4] See https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:1998-07-25;286.

[5] The legislation changed slightly and became less restrictive in 2012 with the so-called Fornero reform.

than ten months of absence during the five years of legal residence, a minimum earned income, and the successful completion of an Italian language test), immigrants become eligible for a permanent permit of unlimited duration.[6] Finally, applying for Italian citizenship requires ten years of continuous (legal) residence.

In contrast, EU citizens may live and work in the EU without a work permit due to the free movement of persons and the right of establishment principles at the core of the single European market. Further, they are guaranteed equitable treatment in terms of employment, wages, and working conditions.

Since its beginnings in 1951, the EU has expanded a number of times by admitting new member states to the Union. Central to this expansion was the inclusion of Bulgaria and Romania. Both countries applied for EU membership in 1995 and started their accession negotiations in 2000, which successfully concluded in December 2004. In September 2006, the European Commission concluded that both countries were ready to fulfil the obligations of EU membership, and on 1st January 2007, they finally joined the EU.

However, acquiring EU status did not automatically grant unrestricted rights for Bulgarians and Romanians to work across the EU. The Accession Treaties, in fact, allowed existing member states to impose transitional labour market restrictions for a maximum of seven years following their accession. The majority of member states, including Italy, announced that they would impose temporary restrictions to protect their labour markets from an expected large inflow of Romanians and Bulgarians. However, only three days prior to EU accession, on 28th December 2006, the newly elected centre-left government in Italy lifted all restrictions for workers employed in the following sectors[7]: agriculture, hotel and tourism, managerial and highly skilled work, domestic work, care services, construction, engineering, and seasonal work. These sectors accounted for 57% of employed Bulgarian and Romanian workers in 2006 (Italian Labour Force Survey). For all the other sectors, including the manufacturing sector, a simplified procedure was introduced to obtain a work authorisation in Italy. However, this was primarily a formal procedure designed to check contractual conditions for issuing work authorisations. Crucially, there were no numerical quotas set for Romanians and Bulgarians.[8]

As a result, in 2007, Italy stood as the sole major economy in Europe to lift restrictions on workers from Romania and Bulgaria, granting them in practice full rights to work in Italy. In essence, the new legal framework after the EU accession acted as a permanent work permit for both documented (who did not have to renew their permits anymore) and undocumented (who became documented without the need to obtain any residence permit) immigrants (see also Mastrobuoni and Pinotti (2015) and Adamopoulou and Kaya (2020) on this).

Although the EU accession of Romania and Bulgaria was an expected event, the sudden, unforeseen decision by the Italian government to remove labour market barriers turns this case into an interesting example of a quasi-natural experiment.

3. Data

3.1. Health care data

The primary source of data is the administrative data set from the region of Lombardy in Italy obtained under the ministerial project NETWORK.[9] This data set contains information on all individuals who are legal residents in the Lombardy region and the health care services they received from the region from 2004 to 2021. For each individual in the data set, we know their sex, year and place of birth, date of arrival in the region, and eventual date of death or departure from the region. Furthermore, we have information on their pharmaceutical prescriptions dispensed by general practitioners (GPs) or specialists. The data set includes, for each prescription, the patient identifier, the date of prescription, the duration of the prescription, expressed in number of defined daily doses (DDD),[10] and the Anatomical Therapeutic Chemical (ATC) code of the active ingredient in the pharmaceutical.

We build proxies for the mental well-being of individuals in our sample by exploiting information on their pharmaceutical prescriptions. As a main proxy, we consider psychotropic drugs for treating psychological distress. Accordingly, we considered all prescriptions administered by a GP or specialist over time, identified using the ATC classification, such as antipsychotics (N05 A), anxiolytics (N05B), and hypnotics and sedatives (N05C), antidepressants (N06 A), psychostimulants (N06B), and psycholeptics and psychoanaleptics in combination (N06C).

As an alternative outcome, we focused on pharmaceuticals prescribed to treat hypertensive conditions. Using the ATC classification, we used antihypertensives (C02), diuretics (C03), beta-blocking agents (C07), calcium channel blockers (C08), and renin-angiotensin system (C09). We note that hypertension can be caused by a variety of factors, including exposure to stress as well as unhealthy habits (such as physical inactivity, a high-salt diet, smoking, and excessive alcohol consumption), genetic factors, obesity, comorbidities (such as diabetes or kidney disease).[11] A selection of prescriptions of pharmaceutical products with similar ATC codes has been carried out by Rocco et al. (2018) when analysing the effect of job loss on the probability that workers are prescribed psychotropic or antihypertensive drugs. Exploiting information on pharmaceutical prescriptions, we build a measure of mental health that is equal to 1 if the individual has been issued at least one of the selected prescriptions during the reference year and 0 otherwise.

---

[6] Note that the Italian language test was introduced in December 2010, which is after our sample period.

[7] For further details, refer to the law enacted on December 28, 2006, with Protocol number 4468, Ministry of the Interior Protocol number 23/II/2175/06.

[8] For more information, refer to the law enacted on 28th December 2006, with Protocol number 4468, Ministry of the Interior Protocol number 23/II/2175/06, circular number 2.

[9] We refer to the project identified by the code NET-2016 02363853.

[10] The DDD is a measure of drug consumption introduced by the WHO in 1970 and defined as the average drug dose per day for adults.

[11] See, for example, https://www.nhs.uk/conditions/high-blood-pressure-hypertension/causes/.

3.2. ISMU data

The second source of data for our analysis is an annual survey carried out by the ISMU since 2001. The aim of this survey is to document the living and working conditions of the migrant population in the Lombardy region. The data are a random sample of approximately 8000 random individuals interviewed every year, including regular and irregular migrants residing in the region. Each wave collected data on migrants' demographic characteristics, such as age, country of origin, legal status, type of residence permit, year of arrival in Italy and in Lombardy, work and education status and some additional, wave-specific questions.

ISMU data are collected using a centre sampling (CS) method, a sampling technique particularly suitable for surveying immigrants, which exploits their tendency to cluster in specific geographical locations (Baio et al., 2011; Blangiardo, 2008). The first step is to identify a list of popular "centres" representative of the main aggregation points of the individuals under study (e.g., ethnic shops, cultural and social clubs, churches, health care facilities, job centres, open areas/aggregation points) and then randomly select the meeting points and the migrants who visited them for interviews. At each location, interviewees are asked how often they visit any of the other meeting points, which allows ex post selection probabilities to be computed and added to the sample. The face-to-face interviews conducted under the CS method were anonymous and structured with closed-ended questions. They are carried out by interviewers, who are themselves foreigners and who are adept at gaining the trust of interviewees and dealing with any linguistic or communication issues that may arise during the survey process. The collected sample provides valid estimates of the size of the immigrant population (regular and irregular) and a detailed picture of the migration phenomenon in the Lombardy region.[12]

We use these data for two main reasons. First, since our health care data set has very little information on individual characteristics, we exploited ISMU data to produce a better understanding of the composition of the treatment and control groups in the health care data set. Second, we rely on these data to analyse the impact of the enlargement on the main sources of distress and labour market outcomes.

In the waves for 2004 and 2009, the ISMU collected information on factors that negatively affect respondent's health status, with eight possible answers: no reason, working conditions, housing, homesickness, poverty, unemployment, communication (language problems), and information issues.[13] While this is a general question that does not refer only to mental health, it provides us with interesting information about the main sources of concern for the respondents' well-being. To explore the impact of EU enlargement on individual well-being and sources of distress, we created six dummy variables for selected answers to this question.[14]

Additionally, we use yearly waves to perform our analysis on the labour market channel. In particular, ISMU data provide information on respondents' occupational status, including occupational sector (formal or informal) and type of employment contract (temporary or permanent).[15] Finally, a self-reported measure of personal net monthly labour income is provided for employed respondents.

3.3. Sample selection

We want to evaluate the impact of EU enlargement on migrants' mental well-being by exploiting the quasi-natural experiment discussed in Section 2 and adopting a linear difference-in-differences (DID) approach. This approach requires a treatment group of individuals affected by the policy and a comparison group of individuals unaffected by the policy. In our health care data set we define the sample of migrants born in Romania and Bulgaria as the treatment group and all individuals born in Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Kosovo, Albania, North Macedonia, and Turkey as the control group. Migrants from those countries provide the natural counterpart to our treatment group, as all these countries were EU candidate members at the time, so they are comparable in terms of the economic and political criteria required for admission. In addition, with the exception of Turkey, all these countries largely belong to the same geographical macro-area and share similar linguistic and cultural characteristics. We finally observe that the same countries for the treatment and control groups were considered by Adamopoulou and Kaya (2020) and Mastrobuoni and Pinotti (2015).

As we want to compare the use of pharmaceuticals before and after the acquisition of EU citizenship, we limit our analysis to migrants who have been continuously residing in the region from 2004 to 2009. This allows us to obtain a panel data set that is balanced both in terms of time horizons and in the number of individuals in the pre- and post-treatment periods. Keeping a balanced

---

[12] As written in the methodological note of the survey "other than providing a valid estimate of the size of the immigrant population (regular and not), the second advantage of the CS method is that it is specifically customised to provide a detailed picture of the migration phenomenon. Indeed, relative to official data sources, the survey contains more precise and detailed information on the demographic and socioeconomic characteristics of the immigrant population. Moreover, it collects valuable and unique information on specific aspects related to the migration phenomenon, for instance, on integration processes, paths in and out the illegal status, remittance behaviours, or perceived discrimination". Mastrobuoni and Pinotti (2015), Accetturo and Infante (2010), Dustmann et al. (2017), and Adamopoulou and Kaya (2020) also used ISMU data. Interestingly, Adamopoulou and Kaya (2020) computed descriptive statistics using the ISMU survey and the official registry of immigrants residing in Lombardy in 2006 provided by the Italian National Institute of Statistics (ISTAT). Their data analysis confirmed that the ISMU survey is representative of the immigrant population in Lombardy in terms of nationality and gender.

[13] More precisely, respondents were asked to answer the question, "Which factors currently have a negative impact on your health status?" We note that in 2004, respondents were allowed to choose up to two answers to this question, while in 2009, they could select up to three answers.

[14] We disregard communication and information issues as they are irrelevant to our research question.

[15] We construct these three variables using the question of migrants' working status. Respondents can indicate whether they are unemployed, students, housepersons, or employed. For those who are employed, they can specify whether their occupation entails a formal contract and whether the contract is permanent.

sample in terms of individuals will avoid possible problems of non-random attrition in our data if, for instance, migrants without EU citizenship tend to leave the country at a different rate than migrants with EU citizenship.

Hence, we selected all individuals aged between 18 and 59 years in the treatment and control groups registered with the Health Lombardy System in 2004. By doing so, we are able to follow individuals who are working-age adults during the sample period, who presumably are not enrolled in education.[16]

When using a DID approach, one key assumption is the absence of anticipation effects, implying that the policy should not have any effect before its implementation date. In our case, anticipation effects could manifest if the enlargement of the European Union (followed by the sudden elimination of employment barriers) impacted the mental well-being of immigrants subject to the change before its actual implementation date. For instance, some treated immigrants may have foreseen the accession of Romania and Bulgaria to the EU without the imposition of transitional labour market restrictions (refer to Section 2 for details on this). This anticipation may have been particularly pronounced in the years subsequent to the conclusion of the EU accession negotiations in 2004, especially as the date drew closer.[17] To mitigate anticipation effects in our sample, we restrict the analysis only to individuals who arrived in the region at most in 2004, before the conclusion of the access negotiations to the EU.[18]

We further drop from our sample all migrants who arrived before 2000. The reason for this choice is that (EU and Extra-EU) immigrants are eligible for citizenship after ten years of legal stay in Italy. Without excluding these individuals, immigrants in the control group could also acquire citizenship. Since we do not have information on the year of arrival in Italy, we assume that it corresponds to the year migrants are first registered to the Health Lombardy System.[19]

After these cleaning operations, the final sample of our health care data set consisted of a balanced panel over a 6-year period including 15,734 male migrants aged between 18 and 59 years in 2004 (for a total of 94,404 observations) and 15,943 female migrants aged between 18 and 59 years in 2004 (for a total of 95,658 observations). Tables A.1 and A.2 provide summary statistics for men and women, respectively, by age group.

One key assumption of the DID approach is comparability between the treatment and control groups before the policy was implemented.

To gain further insight into the characteristics of migrants in both the treatment and the control groups, we exploit ISMU data.

To have a sample from the ISMU data that is comparable to that in our health care data, we only retain individuals who reported having a valid residence permit (permanent or temporary) at the time of the interview. In fact, due to the administrative nature of the health care data set, our sample refers only to documented immigrants. We then drop individuals with Italian citizenship and retain only individuals with less than ten years of residence in Italy to exclude immigrants who can be eligible to apply for Italian citizenship.[20] Again, we consider migrants who arrived in Italy after 1st January 2000, and who entered Italy at the end of 2004 at the latest. Finally, we select migrants who belong to cohorts 1945–1986 (i.e., aged between 59 and 18 in 2004 and aged between 64-23 in 2009). In Section 5.1, we will discuss the comparability between the treatment and control groups during the pre-treatment period based on this selected sample.

Finally, to explore sources of distress and labour market channels with the use of ISMU data, in our empirical analysis, we focus on a subsample of younger workers: migrants who belong to the 1964–1986 cohort (i.e., aged between 18 and 40 in 2004 and aged between 23–45 in 2009). We do this for two main reasons. First, our baseline results on mental health hold especially for younger workers, and this analysis serves as a supplementary explanation. Second, after our sample selection, we would retain too few observations (only 347 in total, 163 for men and 184 for women) in the older cohorts, i.e., migrants born between 1945 and 1963. The final sample in the ISMU data set comprises 1169 individual observations for men and 1118 individual observations for women over the sample period 2004–2009. Tables A.3 and A.4 present summary statistics for men and women, respectively.

4. Methods

4.1. Panel data analysis

In this paper, we adopt a linear DID approach to study the effect of EU enlargement on migrants' mental well-being. Our baseline equation takes the following form:

$$h_{it} = \beta \cdot post_{2007} \cdot treatment_i + \zeta' \cdot \mathbf{x}_{it} + \delta_i + \eta_t + \epsilon_{it} \tag{1}$$

---

[16] While the Health Lombardy System does not have information on education, ISMU data confirm that few immigrants in the selected sample have post-secondary education or are students. However, we perform some robustness checks on this selection choice in Section 5.

[17] For a similar discussion, see also Adamopoulou and Kaya (2020).

[18] Accession negotiations to the EU were concluded on 16th December 2004. We assume that all migrants who migrated in 2004 made their migration choice before this date.

[19] We use ISMU data to validate this choice. Our concern is that the year of arrival in Italy for migrants differs greatly from the year of arrival in the region. ISMU data allow us to control for that since it reports both the date of arrival in Italy and in Lombardy specifically. First, we restrict the sample to immigrants who entered Italy between 2000 and 2004 and resided in the region during our estimation period. We observe that more than 90% of those migrants moved into the region within one year of their arrival in Italy. As a further check, we performed the opposite operation, and we restricted the sample to migrants who arrived in Lombardy between 2000 and 2004. Approximately 85% of them entered the region within one year of their arrival in Italy.

[20] Another possible concern is the fact that migrants who meet certain requirements can qualify for a permanent residence permit after five years of residence. We have checked this potential issue using ISMU data. According to Table 1, less than 3% of male migrants and less than 4% of female migrants held a permanent residence permit before 2007. When we restrict the sample to migrants aged between 18 and 40 years in 2004 who have resided in Italy for at least five years, the phenomenon still appears to be quite rare. Only 13.7% of male eligible individuals in our sample (847 observations) held a permanent permit, and this share decreased to 11.6% if we restricted the analysis only to individuals in the control group (567 observations). These numbers are significantly higher for women, where 27.2% of eligible individuals have a permanent permit (712 observations).

Table 1

Summary statistics: Socio-demographic characteristics by gender of migrants born between 1945 and 1986 in our selected sample of countries (ISMU 2004–2006).

Panel A	Balance Tables - Regular migrants pre 2007: Men							
	Treated			Control			Difference	
Outcome Variable	N	Mean	SD	N	Mean	SD	Diff.	p (2-tailed)
Age	243	32.663	7.570	473	30.146	8.479	2.517	0
Years Since Arrival	243	3.942	1.284	473	3.871	1.333	.071	.488
Permanent Permit	243	0.029	0.168	473	0.025	0.157	.003	.791
Residence Permit: Family	243	0.045	0.208	473	0.055	0.228	−.01	.568
Residence Permit: Work	243	0.922	0.269	473	0.850	0.358	.072	.003
Residence Permit: Study	243	0.008	0.091	473	0.066	0.248	−.057	0
Personal Income	216	1203.333	425.751	403	1192.402	425.542	10.931	.761
Employed	240	0.963	0.190	454	0.930	0.256	.033	.056
Houseperson	240	0.004	0.065	454	0.004	0.066	0	.963
Student	240	0.004	0.065	454	0.033	0.179	−.029	.002
Unemployed	240	0.029	0.169	454	0.024	0.154	.005	.706
Tertiary Education	243	0.086	0.282	473	0.095	0.294	−.009	.699
Muslim	243	0.008	0.091	473	0.518	0.500	−.51	0
PANEL B	Balance Tables - Regular migrants pre 2007: Women							
	Treated			Control			Difference	
Outcome Variable	N	Mean	SD	N	Mean	SD	Diff.	p (2-tailed)
Age	343	32.860	7.805	351	31.387	7.453	1.473	.011
Years Since Arrival	343	3.615	1.476	351	3.726	1.363	−.111	.302
Permanent Permit	343	0.038	0.191	351	0.085	0.280	−.048	.009
Residence Permit: Family	343	0.262	0.441	351	0.573	0.495	−.31	0
Residence Permit: Work	343	0.688	0.464	351	0.319	0.467	.369	0
Residence Permit: Study	343	0.015	0.120	351	0.094	0.292	−.079	0
Personal Income	253	862.846	265.696	192	776.615	321.546	86.231	.003
Employed	339	0.805	0.397	345	0.577	0.495	.228	0
Houseperson	339	0.112	0.316	345	0.278	0.449	−.166	0
Student	339	0.015	0.121	345	0.075	0.264	−.061	0
Unemployed	339	0.065	0.247	345	0.070	0.255	−.005	.808
Tertiary Education	343	0.207	0.406	351	0.134	0.341	.073	.011
Muslim	343	0.023	0.151	351	0.416	0.494	−.393	0

where h_{it} represents our mental health outcome measure. The coefficient β is our key parameter capturing the causal effect of EU enlargement on the dependent variable. $\mathbf{x}_{it}$ is a vector of individual-specific characteristics where we include age and age squared and fixed effects for the number of years since arrival in the region. We include time since arrival dummies to account, on the one hand, for the beneficial effect of a relatively longer stay in the country in terms of higher integration, increased language proficiency, a greater ability to interact with the health care system (e.g., Clarke and Isphording, 2017), and increased access to long-term residence permits and, on the other hand, for the "negative acculturation effect", as immigrants' health status tends to decrease with the time spent in the host country (e.g., Jasso et al., 2004; Orrenius and Zavodny, 2009; Grove and Zwi, 2006). To account for individual, time-invariant heterogeneity, we include individual fixed effects, δ_i. With the time fixed effects η_t, we aim to capture the effect of shocks common to all individuals. Finally, ϵ_{it} represents an error term with standard errors clustered at the individual level.

We first estimate Eq. (1) using all individuals in the sample, categorised by gender. To explore heterogeneity in the effect of the policy on young versus older migrants, we then split the sample into age groups, a younger group composed of individuals aged 18 to 40 years in 2004 and an older group made of individuals aged 41 to 59 years in 2004.

4.2. Repeated cross section analysis

As discussed in Section 3, we construct several additional outcomes using ISMU survey data. First, we analyse subjective measures of well-being using information available from the 2004 and 2009 surveys. More specifically, we consider answers to the question "Which factors currently have a negative impact on your health status?" and we construct six dummy variables for selected answers to this question. These measures allow us to shed light on the factors that may negatively affect migrants' well-being, helping us to better identify the mechanisms behind our results on medical prescriptions. Second, we exploit the ISMU data to explore the labour market channel by studying the impact of EU enlargement on a set of labour market outcomes. A number of studies have documented a strong relationship between migrants' legal status and their labour market outcomes (see, among others, Giuntella and Lonsky, 2020; Adamopoulou and Kaya, 2020). These outcomes are relevant since they directly affect individuals' mental health, and this effect is particularly strong among young male adults (Rocco et al., 2018; Moscone et al., 2016).

To test this hypothesis, we use the following empirical specification:

$$y_{ict} = \beta \cdot post_{2007} \cdot treatment_{ic} + \boldsymbol{\gamma}' \cdot \mathbf{x}_{ict} + \delta_c + \eta_t + \epsilon_{ict} \tag{2}$$
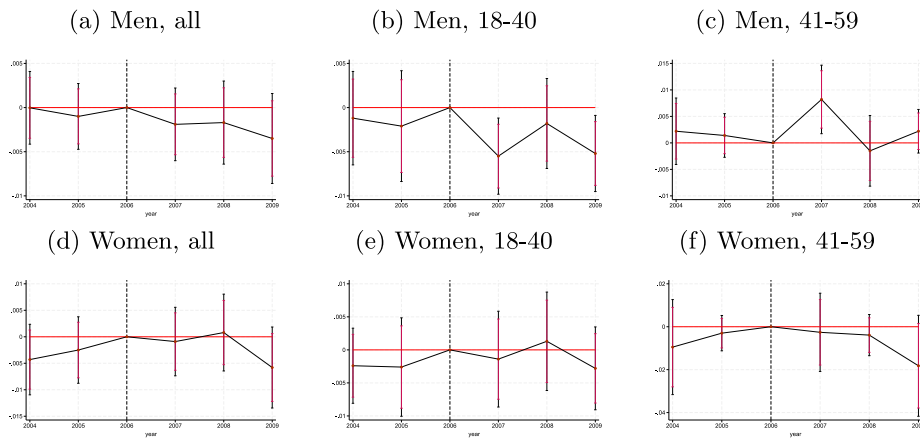
Fig. 1. Event study for psychotropic drug prescriptions using the health care data set.

Notes: Each sub-figure shows the dynamic effect of being in the treatment group on prescriptions of psychotropic drugs keeping 2006 as reference year. All the regressions include as controls: year fixed effects, individual fixed effects, time since arrival fixed effects, age and age square. Standard errors are clustered at the individual level. The vertical red and black bars show the 90% and 95% confidence intervals, respectively.

where y_{ict} is our subjective well-being measure or the labour market outcome for individual i from country of origin c, observed in year t. Additionally, in this equation, the coefficient β is our key parameter capturing the causal effect of EU enlargement on the dependent variable y_{ict}. $\mathbf{x}_{ict}$ is a vector of individual controls, including age, age squared, time since arrival in Italy fixed effects, religion, number of children, gender, the purpose of the residence permit, education, marital status, and province of residence fixed effects.[21] We incorporate country of origin-fixed effects, δ_c, to capture time-invariant characteristics common to all individuals from a specific country, such as cultural or historical factors, and time-fixed effects η_t as proxies for time shocks common to all individuals. Finally, ϵ_{ict} is the error term with standard errors clustered at the nationality $\times$ year level to account for possible correlation across individuals belonging to the same nationality and within the same wave.

5. Results: Panel data analysis

5.1. Identification

In this subsection, we discuss the validity of the DID identification assumptions for our main outcome of interest, the prescription of psychotropic drugs. One critical assumption for the DID approach to be valid is the parallel trend assumption, which states that, in the absence of treatment, the difference between the control and treatment groups should be constant or fixed over time. One first approach to test this assumption is by checking that the characteristics of individuals from the treatment and control groups are similar in the pre-treatment period.

Table 1 provides summary statistics for demographic characteristics of migrants in the years from 2004 to 2006, splitting the analysis by gender. While Panel A shows that the differences in the characteristics of men from the treatment and control groups are statistically insignificant for most variables, Panel B reveals that among women, these differences are significant in terms of several variables, such as labour market outcomes, residence permit typology, and education. To investigate whether this could affect our estimates, we conduct additional checks on the pre-treatment balance between the control and treatment groups by performing an event-study analysis for Eq. (1). Accordingly, we replace the variable $post_{2007} \cdot treatment_{ic}$ with year dummies interacted with the treatment group for the period 2004–2009, using the year 2006 as a reference year. Fig. 1 displays estimated coefficients and associated 95% (90%) confidence intervals for the year dummies interacted with the treatment group by age group for men (Panels (a) to (c)) and for women (Panels (d) to (f)) for psychotropic drug prescriptions.

The results suggest that pre-treatment dynamics of the treatment group are comparable to those of the control group for both men and women, thus validating our DID approach.

5.2. Baseline results

Table 2 presents the results from the estimation of the baseline Eq. (1) using prescriptions of psychotropic drugs from the health care data. As before, we carry out the estimation using three different samples: the full sample (Columns (1) and (4)), the 18–40 age group (Columns (2) and (5)), and the 41–59 age group (Columns (3) and (6)), separated by gender. While Columns (1) to (3)

Table 2
The impact of EU enlargement on migrants' psychotropic drug prescriptions.

Panel A	MEN					
Age group in 2004	Full sample	18–40	41–59	Full sample	18–40	41-59
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	−0.0016	−0.0032*	0.0031	−0.0020	−0.0031**	0.0019
	(0.0016)	(0.0013)	(0.0026)	(0.0016)	(0.0012)	(0.0033)
Observations	94,404,	69,426	24,978	94,404	69,426	24,978
R^2	0.44885	0.45300	0.43900	0.44892	0.45308	0.43923
Panel B	WOMEN					
Age group in 2004	Full sample	18–40	41–59	Full sample	18–40	41-59
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	0.0010	0.0019	−0.0022	0.0003	0.0007	−0.0041
	(0.0025)	(0.0031)	(0.0017)	(0.0025)	(0.0021)	(0.0045)
Observations	95,658	73,272	22,386	95,658	73,272	22,386
R^2	0.44684	0.43250	0.47767	0.44892	0.45308	0.43923
Controls	×	×	×	√	√	√
Individual f.e.	√	√	√	√	√	√
Year f.e.	√	√	√	√	√	√
Time since arrival f.e.	×	×	×	√	√	√

Notes: We identify as treated individuals born in Romania or Bulgaria. The dependent variable is the likelihood a migrant has been prescribed a psycotropic drug. Panel A presents results for men, while Panel B for the women. The sample is split according to the age of individuals in 2004: the full sample (Columns (1) and (4)), the 18-40 age group (Columns (2) and (5)), and the 41-59 age group (Columns (3) and (6)). All the specifications include individual and year fixed effects. Columns (4) to (6) include also time since arrival fixed effects and individual-specific control variables (*age* and *age*^{2}). More details on the outcomes variables are provided in Section 3. */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses clustered at the individual level.

present the effect of EU enlargement including only individual and time fixed effects, Columns (4) to (6) include a full set of controls adding time since arrival individual fixed effects and individual-specific control variables. Panel A displays the results for men, and Panel B displays the results for women.

Although we do not observe any statistically significant effect on older male individuals or women, regardless of age, we note a negative and statistically significant effect on younger male adults. This is a sizeable effect: EU enlargement induces a 0.31 percentage point reduction in drug prescriptions (Column 5), corresponding to a 20% reduction in the unconditional mean (see Table A.1). One concern about these results is that our dependent variable may suffer from misclassification error. For instance, social stigma may deter migrants from seeking help from doctors for mental health issues, leading our proxy for mental health to underestimate true health needs. In particular, our binary variable is likely to be affected by a large number of false-negatives, namely, a large number of individuals with zero prescriptions who are actually affected by mental health problems. As shown by Meyer and Mittag (2017) (see their Appendix), in the presence of misclassification errors on the dependent variable, the OLS estimator of a linear probability model is biased. In particular, since the probability of having false negative in our empirical problem is above zero, the effect of the explanatory variables on our dependent variable will be underestimated, and our estimates are likely to represent a lower bound of the true effect.

5.3. Alternative outcome

Following Rocco et al. (2018), we consider pharmaceutical prescriptions to treat hypertension as an alternative outcome. As before, we first perform an event-study analysis to check whether the treatment and control groups are comparable in the pre-treatment period. Fig. A.1 presents the results for the full sample and for the different age groups categorised by gender examined in the analysis.

Table 3 displays the results of the effect of EU enlargement on pharmaceutical prescriptions to treat hypertension. In contrast, we do not observe any statistically significant effect for young males, while we observe a positive and statistically significant effect for older male individuals. One possible explanation is that the causes of hypertension are complex. Risk factors for hypertension include, for example, poor eating habits, alcohol consumption, lack of physical activity, smoking and, even if stress has long been listed as a potential cause of hypertension, there is no consistent evidence that stress can result in hypertension (e.g., Sparrenberger et al., 2009). This can be even more relevant in the younger sample, as younger individuals tend to experience lower rates of hypertension than older individuals. Indeed, the positive effects observed in the older sample could be attributed to changes in dietary or smoking habits influenced by improved labour market conditions and greater affordability of these goods.[22] However, these results should be taken with caution since Panel (c) Fig. A.1 shows that in the pre-treatment period, the probability of prescriptions for individuals in

---

[22] See Cawley and Ruhm (2011) for a discussion of the relationship between income and health behaviours. For example, Apouey and Clark (2015) found that lottery winnings lead to higher General Health Questionnaire (GHQ) mental health scores but also an increase in smoking and social drinking.

Table 3
The impact of EU enlargement on migrants' prescriptions of antihypertensive drugs.

Panel A	Men					
Age group in 2004	Full sample	18–40	41–59	Full sample	18–40	41-59
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	0.0052*	−0.0049	0.00127*	0.0027	0.0001	0.0171***
	(0.0031)	(0.0031)	(0.0063)	(0.0031)	(0.0024)	(0.0051)
Observations	94,404,	69,426	24,978	94,404	69,426	24,978
R^2	0.57447	0.47352	0.63322	0.57905	0.47506	0.63444
Panel B	Women					
Age group in 2004	Full sample	18–40	41–59	Full sample	18–40	41-59
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	−0.0093***	−0.0057*	−0.0055	−0.0093***	−0.0084***	−0.0047
	(0.0030)	(0.0031)	(0.0086)	(0.0030)	(0.0010)	(0.0038)
Observations	95,658	73,272	22,386	95,658	73,272	22,386
R^2	0.60789	0.43575	0.67507	0.61208	0.43698	0.67607
Controls	×	×	×	√	√	√
Individual f.e.	√	√	√	√	√	√
Year f.e.	√	√	√	√	√	√
Time since arrival f.e.	×	×	×	√	√	√

Notes: We identify as treated individuals born in Romania or Bulgaria. The dependent variable is the likelihood that a migrant has been prescribed pharmaceuticals to treat hypertension. Panel A presents results for the men subsample, while Panel B for the women subsample. The sample is split according to the age of individuals in 2004: the full sample (Columns (1) and (4)), the 18-40 age group (Columns (2) and (5)), and the 41-59 age group (Columns (3) and (6)). All the specifications include individual and year fixed-effects. Columns (4) to (6) include also time since arrival fixed effects and individual-specific control variables (*age* and *age*^{2}). More details on the outcomes variables are provided in Section 3. */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

the treatment group is lower than that of those in the control group (although estimated coefficients are not precisely estimated), while after the EU accession, we do not observe any divergence, as we would expect.

Table 3, Panel B, shows a negative effect of EU enlargement on pharmaceutical prescriptions to treat hypertension for young women. In addition to a reduction in stress, one possible explanation for this result is linked to fertility choices, which can be affected by EU enlargement. We observed that the relationship between pregnancy and the use of hypertensive drugs is not straightforward. While pregnancy status can be associated with an increase in hypertension, guidelines recommend the use of hypertensive drugs only in severe or chronic cases of hypertension (Brown and Garovic, 2014; Al Khaja et al., 2014). To test this hypothesis, using our health care data set we calculated the number of medical examinations received by a gynaecologist or by an obstetrician (*prenatal* visits) as a proxy for fertility choices. We then investigated the effect of EU enlargement on prenatal visits and the effect of prenatal visits on the prescription of drugs for treating hypertension. Table A.5 in the Appendix summarises the results from these regressions. EU enlargement has a positive effect on prenatal visits, which in turn exhibits a negative association with the likelihood of being prescribed drugs for hypertension. These results seem to support the hypothesis that the negative impact of EU enlargement on pharmaceutical prescriptions for treating hypertension in women is linked to fertility choices.

5.4. Robustness checks

We carry out a number of checks to investigate the robustness of our results.

Intensive margin. As a first robustness check, we use an alternative measure for mental health. We construct a measure of pharmaceutical prescriptions that proxies the severity and duration of individual mental health problems. Specifically, we considered the number of defined daily doses (DDDs) of prescribed medication as the dependent variable. Due to its wide range of variation, we employ the inverse hyperbolic sine transformation.[23] The results are reported in Table A.6 and confirm the findings obtained in Tables 2 and 3 for pharmaceutical prescriptions of psychotropic drugs and antihypertensive drugs, respectively.[24]

Alternative definition of age groups. The definition of the age groups in our analysis, particularly in the choice of the lower and upper limits of the younger age group, is arbitrary. Hence, in this section, we perform some robustness checks on the definition of the

---

[23] Alternatively, we could have used a logarithmic transformation. We opted for the inverse hyperbolic sine transformation due to the prevalence of zeros in our outcome variable. In contrast to a logarithmic transformation, an inverse hyperbolic sine (*asinh*) does not require changes in the level of the outcome variable to manage the zeros. The *asinh* and the logarithmic transformation are highly correlated and they have the same interpretation.

[24] In unreported regressions, as before, we perform an event-study analysis to check whether the treatment and control groups are comparable in the pre-treatment period. The results are comparable to those presented in Figs. 1 and A.1. Again, for psychotropic drug prescriptions, parallel trends hold for both men and women at any age. When we focus on antihypertensive drug prescriptions, parallel trends are satisfied for the younger cohort, while exhibiting a positive trend for older men and this assumption is clearly violated in the older women sample.

age groups. First, we increase the minimum age of the younger subsample by three years to 21 years old. This exercise allows us to exclude migrants who are still completing their education. Table A.7 shows that our results are robust. Hence, we perform a similar exercise for the upper limit by increasing the maximum age of the younger subsample to 43 years old. The results of this analysis are reported in Table A.8. Our results are comparable in terms of sign, significance, and magnitude to those presented in the main analysis.

Nonlinear modelling. Given that our main outcome of interest is binary, as a further robustness check we estimate the impact of EU enlargement on mental health using a nonlinear specification. Estimating a DID model in a nonlinear setting is not straightforward. One first complication is that the interaction term between the treatment group and the post-period dummy variables cannot be directly interpreted as the treatment effect in a nonlinear DID model (Ai and Norton, 2003; Liu et al., 2004). A second issue concerns the parallel trend assumptions and, in particular, the fact that even if they hold in a linear setting, they are not necessarily valid in a nonlinear framework (Barkowski, 2021; Lechner, 2011). To address these issues, we rely on the methodology recently proposed by Wooldridge (2023). Specifically, the author proposes the use of an exponential model estimated by Poisson fixed effects, which avoids the incidental parameter problem arising when unit-specific dummies are included in the model. Wooldridge (2023) also proposes an alternative way of testing parallel trends that is suitable when the outcome variable is binary. Following this methodology, we find that parallel trends always hold for the men and older women subsamples, while for the young women subsample, they only hold when the outcome is represented by antihypertensive pharmaceuticals.[25]

Table A.9 reports the estimated average partial effects by applying the Wooldridge (2023) approach. The results confirm the baseline results obtained for the linear case and show that EU enlargement reduces the probability of young males in the treatment group being prescribed psychotropic drugs. However, when focusing on other subgroups or using different outcome variables, the effect appears to be statistically insignificant and therefore not robust to alternative estimation methods.

6. Results: Repeated cross-sectional analysis

In this section, we report the results of the analysis using ISMU data on self-reported sources of distress and labour market outcomes. All the equations follow the specification described in Eq. (2). The aim of this analysis is to shed some light on the mechanisms through which the extension of EU citizenship affects the mental health of immigrants from accession countries. We focus on the young sample which is split by gender. We do that for two main reasons: first, in the previous analysis, the parallel trend assumption and our estimated results especially hold for the young sample; second, we would retain too few observations for the old sample (see Section 3.3).

As shown in Table 1, in the pre-treatment period, the subsamples of women from the treatment and control groups were not very comparable in terms of most of their characteristics. Since the ISMU data consist of repeated cross-sections, it is not feasible to include individual fixed effects in the subsequent analysis to control for unobserved individual heterogeneity, as we did in the health care analysis.

We address this issue by adopting a propensity score matching (PSM) approach. We note that this methodology is not straightforward when dealing with repeated cross-sectional data. In our analysis, we rely on the two-dimensional PSM approach proposed by Zhong et al. (2021). Accordingly, we run a separate analysis for men and women and compare the treatment and control groups in both the longitudinal and cross-sectional dimensions based on their characteristics.[26]

Sources of distress. Fig. 2 and Table A.10 summarise the results from the self-reported well-being analysis for the subsamples of younger workers by gender. Specifically, we estimate Eq. (2), where the dependent variable is a dummy variable that takes the value of one for each of the six possible answers to the following question: "Which factors currently have a negative impact on your health status?".

When examining the subsample of men, we note an overall positive causal impact of EU enlargement on migrants in the treatment group, as documented by the positive coefficient attached to the $Post{\times}Treatment$ variable when the dependent variable is an indicator variable for the answer "no reason". Examining the specific sources of distress for men (Fig. 2(a)), we observe that EU enlargement is accompanied by a statistically significant reduction in worrying about working conditions (−9.9 percentage points, p.p.) and poverty (−9.8 p.p.), while no significant effects are detected for worrying about housing conditions or unemployment. Finally, Fig. 2(a) shows that EU accession significantly reduces the likelihood of migrants being homesick by 17.3 p.p. This result could be explained by the fact that access to the EU is likely to have produced a reduction in the necessary documentation for travelling within Europe. This, in turn, could reduce costs for migrants who wish to visit their home country or want to receive visits from someone in their host country. In addition, family reunification practices were automatically upheld for individuals belonging to new member countries. Taken together, these results may be at the root of the improvement in migrants' mental health status documented by our baseline results.

---

[25] Event studies for pharmaceutical prescription using a nonlinear model are available upon request.

[26] More specifically, we divide our sample into four groups: Treatment Before 2007 (BT), Treatment After 2007 (AT), Control Before 2007 (BC), and Control After 2007 (AC). We then performed PSM between BT and AT, then on the matched observations of BT and BC, matched observations of BC and AC, and finally on the resulting AT and AC samples. We then used the average weight for each observation resulting from these four iterations in our regressions. We balanced our sample over the following variables: citizenship, tertiary education, province of residence, civil status, being a houseperson, residence permit (work, study, family), and year of arrival.
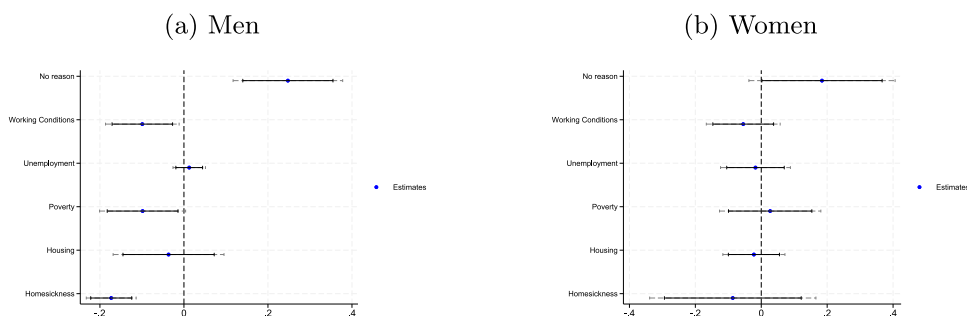
(a) Men   (b) Women

Fig. 2. The impact of EU enlargement on migrants' sources of distress.
Notes: OLS estimation of Eq. (2) using ISMU data. The dependent variables are the migrants' sources of distress: no source of distress, working conditions, unemployment, poverty, housing, and homesickness. Subfigure (a) reports the analysis for the men subsample, while Subfigure (b) is for the women subsample. Blue dots (*Estimates*) report results after applying Two Dimensional Propensity Score Matching. The solid and dashed lines show the 90% and 95% confidence intervals, respectively. Standard errors are clustered at the nationality × year level.

Fig. 2(b) displays the results for women. Specifically, we observe a slight, statistically significant increase in the probability of not reporting any source of distress. However, we do not find statistically significant effects on specific sources of distress. These results are in line with the lack of impact of EU enlargement on women's mental health, as found in the health care data analysis. Finally, given the low number of clusters, we perform a robustness test that computes bootstrapped standard errors. P-values are reported in Table A.10 and confirm our main findings.[27]

We now investigate whether the labour market plays a crucial role in driving our findings, prompting further investigation into this channel.

Labour market outcomes. Fig. 3 and Table A.11 report a summary of the results from the estimation of Eq. (2), where the dependent variable is alternatively given by one of the following labour outcomes: income (in logs), whether the respondent is employed (employment), whether he or she is employed in the formal economy (regular contract), and whether he or she holds a permanent contract. Fig. 3(a) presents the results for the men's subsample and shows that being beneficiaries of EU enlargement is associated with a general improvement in labour market conditions. We observe a positive and statistically significant effect of EU enlargement on labour income and a positive, though not statistically significant, effect on the likelihood of being employed or holding a formal contract when employed. Additionally, we observe a statistically significant increase in the likelihood of holding a permanent contract among subordinate workers. Our findings suggest that EU accession is associated with a 10% increase in salary and a 7.4 percentage point increase in the likelihood of holding a permanent contract. This improvement in labour market conditions is in line with a reduction in worrying about poverty (−9.8 p.p.) and working conditions (−9.9 p.p.) among male treated migrants, as reported in Fig. 2(a).

Fig. 3(b) shows the results for the subsample of women. In this case, we do not observe any statistically significant effect on labour market outcomes other than a positive and statistically significant effect on the likelihood of being employed.

Our findings indicate that accession to the EU has improved working conditions in our treatment group by granting individuals better salaries and working conditions, as already documented by Adamopoulou and Kaya (2020). These effects hold particularly for males, as also confirmed by Adda et al. (2020). Furthermore, our results suggest that enhanced labour market stability decreases uncertainty regarding future labour income and living conditions in destination countries, consequently leading to a reduction in distress, especially among young male migrants within our treatment group.

Our findings are in line with those of Moscone et al. (2016), who showed that being in a status of temporary employment tends to increase the likelihood of developing mental health problems that require medical treatment. Furthermore, our results are compatible with the typical male breadwinner model, which suggests that men perceive the problem of job insecurity (e.g., Carrieri et al., 2014) or unemployment/job loss (e.g., Rocco et al., 2018) more strongly than women, as the latter may place greater value on non-market opportunities such as family responsibilities (Ferrante et al., 2019).

7. Conclusions

In this paper, we studied the effect of the 2007 EU enlargement to Romania and Bulgaria on mental well-being of migrants residing in the Lombardy region in Italy between 2004 and 2009 using a unique administrative data set on health care services provided in the region. We compared Romanian and Bulgarian migrants with individuals coming from countries that were EU candidate members at the time. We find that EU citizenship status is associated with a decrease in psychotropic prescriptions delivered to young male adults. To complement our analysis, we relied on a unique survey of immigrants in the Lombardy region.

---

[27] We compute the bootstraps using the *boottest* Stata command. Bootstrapped p-values were computed using 1000 repetitions, Rademacher weights, and a bandwidth of 0.05.
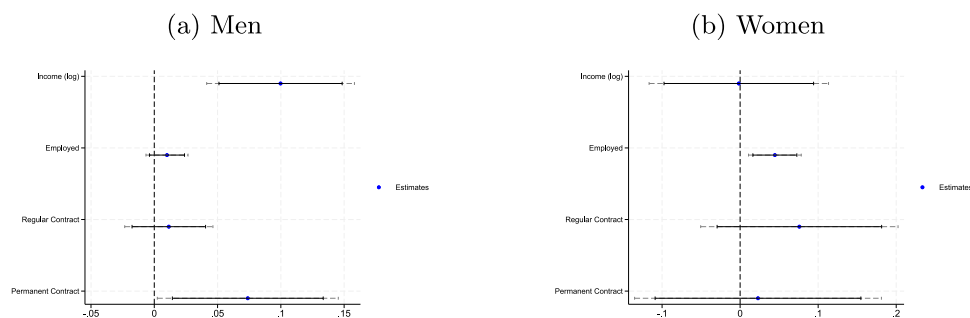
(a) Men

(b) Women

Fig. 3. The impact of EU enlargement on migrants' labour market outcomes.

Notes: OLS estimation of Eq. (2) using ISMU data. The dependent variables are: personal income (log), employment status, whether the worker is employed with a regular contract, whether the worker has a permanent contract. Subfigure (a) reports the analysis for the men subsample, while Subfigure (b) is for the women subsample. Blue dots (*Estimates*) report results after applying Two Dimensional Propensity Score Matching. The solid and dashed lines show the 90% and 95% confidence intervals, respectively. Standard errors are clustered at the nationality × year level.

We found that EU enlargement is associated with an increase in those who reported no sources for distress and a decrease in self-reported causes related, among others, to working conditions, poverty, and homesickness. In line with previous results, we also found that EU accession induces more stable and better-paying jobs. We claim that these effects induce a reduction in stress for individuals in the treatment group, which has a consequent improvement in their mental well-being.

Our study is subject to a number of important limitations. First, as it relies on an administrative data set for all residents in the region, our measures of mental health do not capture the health needs of undocumented immigrants, who are likely most affected by the EU enlargement, as they were granted legal status. Second, factors such as social stigma may prevent sick (legal) immigrants from seeking medical advice. For these reasons, pharmaceutical prescriptions are likely to underestimate the true health needs of migrants, and our results may be interpreted as a lower bound of the true effect of EU enlargement.

One interesting extension of this work would be to investigate the influence of EU enlargement on migrants' demand for care to treat health issues other than mental health problems. This will be the object of a separate study.

From a policy perspective, our results underscore the substantial potential impact of policies to simplify administrative procedures and mitigate uncertainty regarding migrants' residence and work rights within destination countries on the health and well-being of migrants. By streamlining administrative processes and offering clarity within the host nation's systems, policy makers can create an environment conducive to improved health and enhanced overall well-being for migrants. This may not only contribute to addressing health needs but also foster a sense of security and belonging, which promote integration and societal cohesion.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The health care data that have been used are confidential.

Appendix

A.1. Summary statistics

See Tables A.1–A.4.

A.2. Additional figures and tables: Panel data analysis

See Fig. A.1, Tables A.5–A.9.

A.3. Additional figures and tables: Repeated cross-sectional analysis

See Tables A.10 and A.11.

Table A.1

Summary statistics on the health care data set (Men).

Panel A	Full Sample				
	N	Mean	SD	Min	Max
Treatment Group	94,404	0.3930	0.4884	0.0000	1.0000
Age	94,404	37.1886	9.2774	18.000	64.000
Years Since Arrival	94,404	4.2391	2.1734	0.000	9.000
Psychotropic Drug Prescriptions	94,404	0.0158	0.1248	0.000	1.000
Antihypertensive Drug Prescriptions	94,404	0.0671	0.2503	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	94,404	2.325	30.817	0.000	1641.170
Antihypertensive Drug Prescriptions (DDD)	94,404	25.35	158.06	0.000	8701.19
Panel B	Age in 2004: 18-40				
Treatment Group	69,426	0,4024	0.4904	0.0000	1.0000
Age	69,426	32.8036	5.9552	18.000	45.000
Years Since Arrival	69,426	4.1953	2,1593	0.000	9.000
Psychotropic Drug Prescriptions	69,426	0.0153	0.1226	0.000	1.000
Antihypertensive Drug Prescriptions	69,426	0.03818	0.1916	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	69,426	2.355	32.252	0.000	1641.170
Antihypertensive Drug Prescriptions (DDD)	69,426	11.1	109.219	0.000	8701.19
Panel C	Age in 2004: 41-59				
Treatment Group	24,978	0,3666	0.4819	0.0000	1.0000
Age	24,978	49.3767	4.9732	41.000	64.000
Years Since Arrival	24,978	4.3609	2,2077	0.000	9.000
Psychotropic Drug Prescriptions	24,978	0.0175	0.1310	0.000	1.000
Antihypertensive Drug Prescriptions	24,978	0.1476	0.3547	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	24,978	2.241	26.424	0.000	1096.00
Antihypertensive Drug Prescriptions (DDD)	24,978	64.96	243.187	0.000	4608.00

Notes: Summary statistics for health care variables for the men subsample, for the period 2004–2009. Panel A reports the summary statistics for the whole sample. Panel B reports summary statistics for the cohorts aged between 18-40 in 2004. Panel C reports summary statistics for the cohorts aged between 41-59 in 2004.

Table A.2

Summary statistics on the health care data set (Women).

Panel A	Full Sample				
	N	Mean	SD	Min	Max
Treatment Group	95,658	0.4670	0.4989	0.0000	1.0000
Age	95,658	36.1730	9.8452	18.000	64.000
Years Since Arrival	95,658	4.1849	2.1564	0.000	9.000
Psychotropic Drug Prescriptions	95,658	0.03980	0.1955	0.000	1.000
Antihypertensive Drug Prescriptions	95,658	0.0779	0.2681	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	95,658	5.235	41.135	0.000	1728.000
Antihypertensive Drug Prescriptions (DDD)	95,658	24.81	135.317	0.000	6597.25
Panel B	Age in 2004: 18-40				
Treatment Group	73,272	0,4852	0.4998	0.0000	1.0000
Age	73,272	31.8185	6.0279	18.000	45.000
Years Since Arrival	73,272	4.1450	2,1512	0.000	9.000
Psychotropic Drug Prescriptions	73,272	0.03596	0.1861	0.000	1.000
Antihypertensive Drug Prescriptions	73,272	0.03630	0.1870	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	73,272	4.623	38.749	0.000	1728.000
Antihypertensive Drug Prescriptions (DDD)	73,272	7.291	68.867	0.000	6597.25
Panel C	Age in 2004: 41-59				
Treatment Group	22,386	0,4077	0.4914	0.0000	1.0000
Age	22,386	50.4258	5.4815	41.000	64.000
Years Since Arrival	22,386	4.3153	2,1683	0.000	9.000
Psychotropic Drug Prescriptions	22,386	0.0524	0.2227	0.000	1.000
Antihypertensive Drug Prescriptions	22,386	0.2142	0.4103	0.000	1.000
Psychotropic Drug Prescriptions (DDD)	22,386	7.238	48.070	0.000	1105.500
Antihypertensive Drug Prescriptions (DDD)	22,386	82.71	241.719	0.000	6504.00

Notes: Summary statistics for health care variables for the women subsample, for the period 2004–2009. Panel A reports the summary statistics for the whole sample. Panel B reports summary statistics for the cohorts aged between 18-40 in 2004. Panel C reports summary statistics for the cohorts aged between 41-59 in 2004.

Table A.3

Summary statistics on ISMU data set (Men).

	ISMU Data				
	N	Mean	SD	Min	Max
Treatment Group	1169	0.328	0.470	0.000	1.000
Age	1169	30.642	5.892	18.000	44.000
Years Since Arrival	1169	5.300	1.879	1.000	9.000
Regular migrant	1169	1.000	0.000	1.000	1.000
Permanent Permit	1169	0.113	0.317	0.000	1.000
Residence Permit: Family	1169	0.044	0.204	0.000	1.000
Residence Permit: Work	1169	0.906	0.292	0.000	1.000
Residence Permit: Study	1169	0.015	0.123	0.000	1.000
Houseperson	1169	0.001	0.029	0.000	1.000
Student	1169	0.017	0.130	0.000	1.000
Unemployed	1169	0.033	0.177	0.000	1.000
Tertiary Education	1169	0.082	0.275	0.000	1.000
Muslim	1169	0.363	0.481	0.000	1.000
Personal Income (log)	1033	7.092	0.347	4.615	8.517
Employed	1169	0.943	0.233	0.000	1.000
Employed (Regular)	1169	0.881	0.324	0.000	1.000
Employed (Permanent)	1169	0.632	0.482	0.000	1.000
	Factors Negatively Affecting Well-being:				
No reason	349	0.501	0.501	0.000	1.000
Working Conditions	349	0.186	0.390	0.000	1.000
Unemployment	349	0.069	0.253	0.000	1.000
Housing	349	0.063	0.243	0.000	1.000
Poverty	349	0.072	0.258	0.000	1.000
Homesickness	349	0.226	0.419	0.000	1.000

Notes: Summary statistics for the ISMU data set for the period 2004–2009. The sample is made of male migrants in the Lombardy region born between 1964 and 1986 in our selected sample of countries.

Table A.4

Summary statistics on ISMU data set (Women).

	ISMU Data				
	N	Mean	SD	Min	Max
Treatment Group	1118	0.464	0.499	0.000	1.000
Age	1118	31.165	5.593	19.000	45.000
Years Since Arrival	1118	4.867	1.899	0.000	9.000
Regular migrant	1118	1.000	0.000	1.000	1.000
Permanent Permit	1118	0.215	0.411	0.000	1.000
Residence Permit: Family	1118	0.450	0.498	0.000	1.000
Residence Permit: Work	1118	0.483	0.500	0.000	1.000
Residence Permit: Study	1118	0.038	0.192	0.000	1.000
Houseperson	1118	0.209	0.407	0.000	1.000
Student	1118	0.033	0.179	0.000	1.000
Unemployed	1118	0.069	0.253	0.000	1.000
Tertiary Education	1118	0.181	0.385	0.000	1.000
Muslim	1118	0.257	0.437	0.000	1.000
Personal Income (log)	720	6.681	0.416	4.615	8.294
Employed	1118	0.687	0.464	0.000	1.000
Employed (Regular)	1118	0.539	0.499	0.000	1.000
Employed (Permanent)	1118	0.268	0.443	0.000	1.000
	Factors Negatively Affecting Well-being:				
No reason	305	0.430	0.496	0.000	1.000
Working Conditions	305	0.102	0.303	0.000	1.000
Unemployment	305	0.125	0.331	0.000	1.000
Housing	305	0.072	0.259	0.000	1.000
Poverty	305	0.085	0.280	0.000	1.000
Homesickness	305	0.302	0.460	0.000	1.000

Notes: Summary statistics for the ISMU data set for the period 2004–2009. The sample is made of female migrants born between 1964 and 1986 in our selected sample of countries.
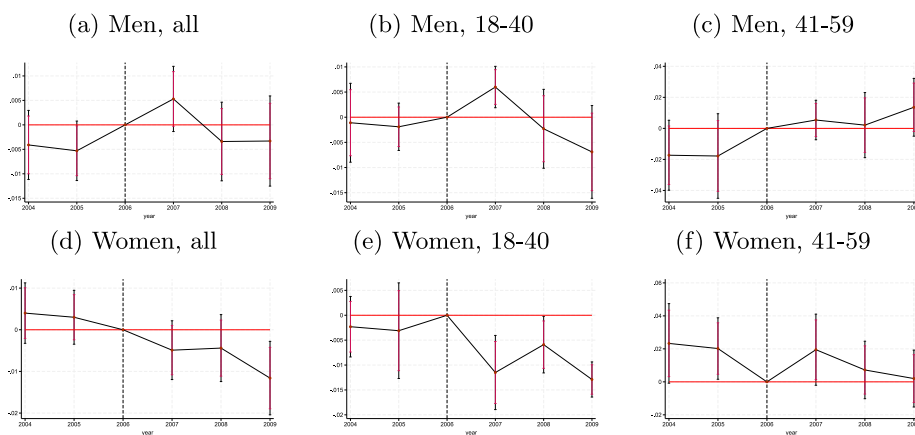
(a) Men, all	(b) Men, 18-40	(c) Men, 41-59
(d) Women, all	(e) Women, 18-40	(f) Women, 41-59

Fig. A.1. Event study for antihypertensive drug prescription using the health care data set.

Notes: Each sub-figure shows the dynamic effect of being in the treatment group on prescriptions of drugs to treat hypertension keeping 2006 as the reference year. All the regressions include as controls: year fixed effects, individual fixed effects, time since arrival fixed effects, age and age square. Standard errors are clustered at the individual level. The vertical red and black bars show the 90% and 95% confidence intervals, respectively.

Table A.5

Fertility and migrants' antihypertensive drug prescriptions.

	WOMEN CHANNELS: PRENATAL VISITS			
	ANTIHYPERTENSIVE PRESCRIPTIONS		PRENATAL VISITS	
Age group in 2004	18–40	41–59	18–40	41–59
	(1)	(2)	(3)	(4)
Post × Treatment Group			0.0984*** (0.0210)	0.0030 (0.0122)
Prenatal Visits	−0.0046*** (0.0009)	−0.0084 (0.0054)		
Observations	73,272	22,386	73,272	22,386
Controls	√	√	√	√
Individual f.e.	√	√	√	√
Year f.e.	√	√	√	√
Time since arrival f.e.	√	√	√	√

Notes: The table reports results from estimation using the same specification as equation (1). Columns (1) and (2) study the relationship between Prenatal visits and antihypertensive drug prescriptions. Columns (3) and (4) study the effect of EU enlargement on the number of Prenatal visits. Prenatal visits are defined as the number of visits received by a woman from a gynecologist or an obstetrician. The number of visits is transformed using an inverse hyperbolic sine transformation. All the specifications include individual and year fixed effects, time since arrival fixed effects, and individual-specific control variables (age and age^2). Columns (1) and (2) include as control the inverse hyperbolic sine of the total number of medical examinations received in a year. */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

Table A.6

Robustness analysis: intensive margin.

	PSYCHOTROPIC PRESCRIPTIONS			
Panel A	MEN		WOMEN	
Age group in 2004	18–40	41–59	18–40	41–59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0116** (0.0031)	0.0098 (0.0048)	0.0018 (0.0082)	−0.0241 (0.0188)
Observations	69,426	24,978	73,272	22,386
R^2	0.53641	0.50079	0.49837	0.56384

Table A.6 (*continued*).

	ANTIHYPERTENSIVE PRESCRIPTIONS			
Panel B	MEN		WOMEN	
Age group in 2004	18–40	41–59	18–40	41-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0029	0.1084***	−0.0530***	−0.0779**
	(0.0031)	(0.0319)	(0.0049)	(0.0273)
Observations	69,426	24,978	73,272	22,386
R^2	0.53691	0.69219	0.50700	0.73658
Controls	√	√	√	√
Individual f.e.	√	√	√	√
Year f.e.	√	√	√	√
Time since arrival f.e.	√	√	√	√

Notes: The table reports results from estimation using the same specification as equation (1). The outcome variable of this analysis is the inverse hyperbolic sine transformation of the number of daily doses prescribed to each individual for the selected drugs included in our analysis. Panel (A) reports results for psychotropic drug prescriptions while Panel (B) for antihypertensive drug prescriptions. Columns from (1) and (2) in each panel report the analysis for the men subsample while columns from (3) and (4) for the women subsample. All the specifications include individual and year fixed effects, time since arrival fixed effects, and individual-specific control variables (age and age^2). */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

Table A.7
Robustness analysis: Moving the lower limit of the younger age group to 21 years old.

	PSYCHOTROPIC PRESCRIPTIONS			
Panel A	MEN		WOMEN	
Age group in 2004	21–40	41–59	21–40	41-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0036**	0.0019	0.0002	−0.0041
	(0.0012)	(0.0033)	(0.0021)	(0.0045)
Observations	66,018	24,978	68,592	22,386
	ANTIHYPERTENSIVE PRESCRIPTIONS			
Panel B	MEN		WOMEN	
Age group in 2004	21–40	41–59	21–40	41-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	0.0012	0.0171***	−0.0091***	−0.0047
	(0.0021)	(0.0051)	(0.0013)	(0.0038)
Observations	66,018	24,978	68,592	22,386
Controls	√	√	√	√
Individual f.e.	√	√	√	√
Year f.e.	√	√	√	√
Time since arrival f.e.	√	√	√	√

Notes: The table reports results from estimation of Eq. (1) where the younger age group is made of individuals with at least 21 years old and at most 40 years old in 2004. Panel (A) reports results for psychotropic drug prescriptions while Panel (B) for antihypertensive drug prescriptions. Columns from (1) and (2) in each panel report the analysis for the men subsample while columns from (3) and (4) for the women subsample. All the specifications include individual and year fixed effects, time since arrival fixed effects, and individual-specific control variables (age and age^2). */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

Table A.8
Robustness analysis: Moving the upper limit of the younger age group to 43 years old.

	PSYCHOTROPIC PRESCRIPTIONS			
Panel A	MEN		WOMEN	
Age group in 2004	18–43	44–59	18–43	44-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0028**	0.0016	0.0004	−0.0043
	(0.0012)	(0.0033)	(0.0019)	(0.0033)
Observations	81,312	13,092	82,302	13,356

Table A.8 (*continued*).

	ANTIHYPERTENSIVE PRESCRIPTIONS			
Panel B	MEN		WOMEN	
Age group in 2004	18–43	44–59	18–43	44-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	0.0005	0.0223**	−0.0081***	−0.0074
	(0.0025)	(0.0076)	(0.0011)	(0.0057)
Observations	81,312	13,092	82,302	13,356
Controls	√	√	√	√
Individual f.e.	√	√	√	√
Year f.e.	√	√	√	√
Time since arrival f.e.	√	√	√	√

Notes: The table reports results from the estimation of Eq. (1) where the younger age group is made of individuals at least 18 years old and at most 43 years old in 2004. Panel (A) reports results for psychotropic drug prescriptions while Panel (B) for antihypertensive drug prescriptions. Columns from (1) and (2) in each panel report the analysis for the men subsample while columns from (3) and (4) for the women subsample. All the specifications include individual and year fixed effects, time since arrival fixed effects, and individual-specific control variables (age and age^2). */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

Table A.9
Robustness analysis: estimation in a nonlinear setting (Poisson).

	PSYCHOTROPIC PRESCRIPTIONS			
PANEL A	MEN		WOMEN	
Age group in 2004	18–40	41–59	18–40	41-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0104**	0.0749	−0.0082	−0.0141
	(0.0045)	(0.1366)	(0.0075)	(0.0340)
Observations	69,426	24,9782	73,272	22,3868
	ANTIHYPERTENSIVE PRESCRIPTIONS			
PANEL B	MEN		WOMEN	
Age group in 2004	18–40	41–59	18–40	41-59
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.0113	−0.0864	−0.0052	0.1222
	(0.0080)	(0.0583)	(0.0087)	(0.1497)
Observations	69,426	24,978	73,272	22,3868
Controls	√	√	√	√
Individual f.e.	√	√	√	√
Year f.e.	√	√	√	√
Time since arrival f.e.	√	√	√	√

Notes: The table reports results from the estimation of the average partial effects in a Poisson model using the Wooldridge (2023) approach. Panel (A) reports results for psychotropic drug prescriptions while Panel (B) for antihypertensive drug prescriptions. Columns from (1) and (2) in each panel report the analysis for the men subsample while columns from (3) and (4) for the women subsample. All the specifications include individual and year fixed effects, time since arrival fixed effects, and individual-specific control variables (age and age^2). */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the individual level.

Table A.10
The impact of EU enlargement on migrants' sources of distress.

	ISMU: REASONS FOR BAD HEALTH					
Panel A	MEN					
	NONE	WORKING CONDITIONS	UNEMPLOYMENT	POVERTY	HOUSING	HOMESICKNESS
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	0.247***	−0.099**	0.013	−0.098*	−0.037	−0.173***
	(0.061)	(0.041)	(0.018)	(0.048)	(0.062)	(0.028)
Observations	296	296	296	296	296	296
Clusters	16	16	16	16	16	16
R^2	0.23	0.22	0.24	0.23	0.17	0.26
p-value (bootstrap)	0.01	0.04	0.44	0.10	0.54	0.03

Table A.10 (*continued*).

Panel B	Women					
	None	Working Conditions	Unemployment	Poverty	Housing	Homesickness
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment Group	0.184*	−0.055	−0.018	0.027	−0.022	−0.086
	(0.104)	(0.053)	(0.050)	(0.072)	(0.044)	(0.118)
Observations	192	192	192	192	192	192
Clusters	16	16	16	16	16	16
R^2	0.40	0.34	0.39	0.51	0.28	0.35
p-value (bootstrap)	0.12	0.31	0.69	0.70	0.71	0.46
Demographic Controls	√	√	√	√	√	√
Province f.e.	√	√	√	√	√	√
Year f.e.	√	√	√	√	√	√
Nationality f.e.	√	√	√	√	√	√

Notes: The table reports estimation of Eq. (2) focusing only on individuals born between 1964 and 1986. The sample is obtained by applying the two dimensional PSM, and in all regressions the weights calculated through PSM are used. The dependent variables are the migrants' sources of distress: no source of distress (Column (1)), working conditions (Column (2)), unemployment (Column (3)), poverty (Column (4)), housing (Column (5)), and homesickness (Column (6)). Panel A reports the results for the men subsample, Panel B for the women subsample. All the specifications include country of origin and year fixed effects, time since arrival fixed effects, province of origin fixed effects and individual-specific controls. Individual-specific controls include age, age squared, religion, number of children, gender, citizenship status, education, and marital status. */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the nationality×year level.

Table A.11

The impact of EU enlargement on migrants' labour market outcomes.

	ISMU: Labor Market Outcomes			
Panel A	Men			
	Income (log)	Employed	Regular Contract	Permanent Contract
	(1)	(2)	(3)	(4)
Post × Treatment Group	0.100***	0.009	0.013	0.074**
	(0.029)	(0.006)	(0.016)	(0.035)
Observations	1,020	1,020	1,016	954
Clusters	45	45	45	44
R^2	0.22	0.27	0.19	0.19
p-value (bootstrap)	0.00	0.15	0.44	0.06
Panel B	Women			
	Income (log)	Employed	Regular Contract	Permanent Contract
	(1)	(2)	(3)	(4)
Post × Treatment Group	−0.002	0.022***	0.094	0.023
	(0.057)	(0.007)	(0.065)	(0.078)
Observations	701	701	696	680
Clusters	45	45	45	45
R^2	0.28	0.16	0.26	0.20
p-value (bootstrap)	0.97	0.01	0.15	0.78
Demographic Controls	√	√	√	√
Province f.e.	√	√	√	√
Year f.e.	√	√	√	√
Nationality f.e.	√	√	√	√

Notes: The table reports estimation of Eq. (2) focusing only on individuals born between 1964 and 1986. The sample is obtained by applying the two dimensional PSM, and in all regressions the weights calculated through PSM are used. The dependent variables are: personal income (log) (Column (1)), employment status (Column (2)), whether the worker is employed with a regular contract (Column (3)), whether the worker has a permanent contract (Column (4)). Panel A reports the results for the men subsample, Panel B for the women subsample. All the specifications include country of origin and year fixed effects, time since arrival in Italy fixed effects, province of origin fixed effects and individual-specific controls. Individual-specific controls include age, age squared, religion, number of children, gender, citizenship status, education, and marital status. More details on the outcomes variables are provided in Section 3. */**/*** indicate significance at 10%/5%/1%, respectively; standard errors in parentheses are clustered at the nationality×year level.

References

Accetturo, Antonio, Infante, Luigi, 2010. Immigrant earnings in the Italian labour market. Giornale Degli Econ. E Ann. Di Economia 69, 1–27.

Adamopoulou, Effrosyni, Kaya, Ezgi, 2020. Not just a work permit: EU citizenship and the consumption behaviour of documented and undocumented immigrants. Can. J. Econ. 53 (4), 1552–1598.

Adda, Jerome, Pinotti, Paolo, Tura, Giulia, 2020. There's More to Marriage Than Love: The Effect of Legal Status and Cultural Distance on Intermarriages and Separations. CEPR Discussion Papers 14432, C.E.P.R. Discussion Papers.

Ai, Chunrong, Norton, Edward C., 2003. Interaction terms in logit and probit models. Econom. Lett. 80 (1), 123–129.

Al Khaja, Khalid A.J., Sequeira, Reginald P., Alkhaja, Alwaleed K., Damanhori, Awatif H.H., 2014. Drug treatment of hypertension in pregnancy: A critical review of adult guideline recommendations. J. Hypertens. 32 (3), 454–463.

Alesina, Alberto, Murard, Elie, Rapoport, Hillel, 2021. Immigration and preferences for redistribution in Europe. J. Econ. Geogr. 21 (6), 925–954.

Apouey, Benedicte, Clark, Andrew E., 2015. Winning big but feeling no better? The effect of lottery prizes on physical and mental health. Health Econ. 24 (5), 516–538.

Baio, Gianluca, Blangiardo, Gian Carlo, Blangiardo, Marta, 2011. Centre sampling technique in foreign migration surveys: A methodological note. J. Official Stat. 27 (3), 451–465.

Barkowski, Scott, 2021. Interpretation of nonlinear difference-in-differences: The role of the parallel trends assumption. Available at SSRN 3772458.

Belloni, Michele, Carrino, Ludovico, Meschi, Elena, 2022. The impact of working conditions on mental health: Novel evidence from the UK. Labour Econ. 76, 102176.

Blangiardo, Gian Carlo, 2008. The centre sampling technique in surveys on foreign migrants. The balance of a multi-year experience. pp. 12–29, United Nations Statistical Commission and EUROSTAT. Working paper.

Brown, Catherine M., Garovic, Vesna D., 2014. Drug treatment of hypertension in pregnancy. Drugs 74, 283–296.

Carrieri, Vincenzo, Di Novi, Cinzia, Jacobs, Rowena, Robone, Silvana, 2014. Insecure, sick and unhappy? Well-being consequences of temporary employment contracts. In: Factors Affecting Worker Well-Being: The Impact of Change in the Labor Market, vol. 40, Research in Labor Economics, Emerald Group Publishing Limited, pp. 157–193.

Cawley, John, Ruhm, Christopher J., 2011. Chapter three - the economics of risky health behaviors. In: Pauly, Mark V., Mcguire, Thomas G., Barros, Pedro P. (Eds.), Handbook of Health Economics. In: Handbook of Health Economics, vol. 2, Elsevier, pp. 95–199.

Clarke, Andrew, Isphording, Ingo E., 2017. Language barriers and immigrant health. Health Econ. 26 (6), 765–778.

Dawson, Chris, Veliziotis, Michail, Pacheco, Gail, Webber, Don J., 2015. Is temporary employment a cause or consequence of poor mental health? A panel data analysis. Soc. Sci. Med. 134, 50–58.

Devillanova, Carlo, Fasani, Francesco, Frattini, Tommaso, 2018. Employment of undocumented immigrants and the prospect of legal status: Evidence from an amnesty program. ILR Rev. 71 (4), 853–881.

Dustmann, Christian, Fasani, Francesco, Speciale, Biagio, 2017. Illegal migration and consumption behavior of immigrant households. J. Eur. Econom. Assoc. 15 (3), 654–691.

Ferrante, Gianluigi, Fasanelli, Francesca, Gigantesco, Antonella, Ferracin, Elisa, Contoli, Benedetta, Costa, Giuseppe, Gargiulo, Lidia, Marra, Michele, Masocco, Maria, Minardi, Valentina, et al., 2019. Is the association between precarious employment and mental health mediated by economic difficulties in males? Results from two Italian studies. BMC Public Health 19, 1–9.

Giuntella, Osea, Lonsky, Jakub, 2020. The effects of DACA on health insurance, access to care, and health outcomes. J. Health Econ. 72, 102320.

Giuntella, Osea, Lonsky, Jakub, Mazzonna, Fabrizio, Stella, Luca, 2021. Immigration policy and immigrants' sleep. Evidence from DACA. J. Econ. Behav. Organ. 182, 1–12.

Grove, Natalie J., Zwi, Anthony B., 2006. Our health and theirs: Forced migration, othering, and public health. Soc. Sci. Med. 62 (8), 1931–1942.

Jasso, Guillermina, Douglas, S. Massey, Rosenzweig, Mark R., Smith, James P., 2004. Immigrant health: Selectivity and acculturation. In: Critical Perspectives on Racial and E Thnic Differences in Health in Late Life. National Academies Press (US).

Kuhn, Andreas, Lalive, Rafael, Zweimüller, Josef, 2009. The public health costs of job loss. J. Health Econ. 28 (6), 1099–1115.

Lechner, Michael, 2011. The estimation of causal effects by difference-in-difference methods. Found. Trends Econometrics 4 (3), 165–224.

Liu, Zhimei, Dow, William H., Norton, Edward C., 2004. Effect of drive-through delivery laws on postpartum length of stay and hospital charges. J. Health Econ. 23 (1), 129–155.

Mastrobuoni, Giovanni, Pinotti, Paolo, 2015. Legal status and the criminal activity of immigrants. Am. Econ. J.: Appl. Econ. 7 (2), 175–206.

Meyer, Bruce D., Mittag, Nikolas, 2017. Misclassification in binary choice models. J. Econometrics 200 (2), 295–311.

Moscone, Francesco, Tosetti, Elisa, Vittadini, Giorgio, 2016. The impact of precarious employment on mental health: The case of Italy. Soc. Sci. Med. 158, 86–95.

Orrenius, Pia M., Zavodny, Madeline, 2009. Do immigrants work in riskier jobs? Demography 46, 535–551.

Ozden, Caglar, Parsons, Christopher R., Schiff, Maurice, Walmsley, Terrie L., 2011. Where on earth is everybody? The evolution of global bilateral migration 1960–2000. World Bank Econ. Rev. 25 (1), 12–56.

Pirani, Elena, 2017. On the relationship between atypical work(s) and mental health: New insights from the Italian case. Social Indicators Res. 130, 233–252.

Reichert, Arndt R., Tauchmann, Harald, 2017. Workforce reduction, subjective job insecurity, and mental health. J. Econ. Behav. Organ. 133, 187–212.

Robone, Silvana, Jones, Andrew M., Rice, Nigel, 2011. Contractual conditions, working conditions and their impact on health and well-being. Eur. J. Health Econ. 12, 429–444.

Rocco, Lorenzo, Crema, Angela, Simonato, Lorenzo, Cestari, Laura, 2018. The effect of job loss on pharmaceutical prescriptions. Soc. Sci. Med. 217, 73–83.

Sparrenberger, Felipe, Cichelero, F.T., Ascoli, A.M., Fonseca, F.P., Weiss, G., Berwanger, O., Fuchs, S.C., Moreira, L.B., Fuchs, F.D., 2009. Does psychosocial stress cause hypertension? A systematic review of observational studies. J. Hum. Hypertens. 23 (1), 12–19.

Wooldridge, Jeffrey M., 2023. Simple approaches to nonlinear difference-in-differences with panel data. Econom. J. 26 (3), C31–C66.

Zhong, Haotian, Li, Wei, Boarnet, Marlon G., 2021. A two-dimensional propensity score matching method for longitudinal quasi-experimental studies: A focus on travel behavior and the built environment. Environ. Plan. B: Urban Anal. City Sci. 48 (7), 2110–2122.