SSM - Mental Health 8 (2025) 100530

Contents lists available at ScienceDirect

SSM - Mental Health

journal homepage: www.journals.elsevier.com/ssm-mental-health

Migrant integration policies, regional social disadvantage, ethnicity and psychosis risk: Findings from the EU-GEI study

Salome M. Xavier [a,b], Hannah E. Jongsma [c], Charlotte Gayer-Anderson [d], Diego Quattrone [e,f], Sophie Blackmore [a,g], Ilaria Tarricone [h,i], Pierre-Michel Llorca [j], Eva Velthorst [k], Robin M. Murray [l], Peter B. Jones [c,m], James B. Kirkbride [n], Craig Morgan [d], Jean-Paul Selten [o,p], Els van der Ven [g,*,1], Srividya N. Iyer [a,b,1]

[a] Department of Psychiatry, McGill University, 845 Rue Sherbrooke O, Montreal, QC, H3A 0G4, Canada
[b] Prevention and Early Intervention Program for Psychosis (PEPP), Douglas Mental Health University Institute, 6875 Boulevard LaSalle, Montreal, QC, H4H 1R3, Canada
[c] Department of Psychiatry, University of Cambridge, Herchel Smith Building for Brain & Mind Sciences, Forvie Site, Robinson Way, Cambridge, CB2 0SZ, UK
[d] ESRC Centre for Society and Mental Health, Institute of Psychiatry, King's College London, De Crespigny Park, Denmark Hill, SE5 8AF, London, UK
[e] Social, Genetic, and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, De Crespigny Park, Denmark Hill, London, SE5 8AF, UK
[f] Unit of Psychiatry, "P. Giaccone" General Hospital, Via G. La Loggia n.1, Palermo, 90129, Italy
[g] Vrije Universiteit Amsterdam, Faculty of Behavioural and Movement Sciences, Clinical Developmental Psychology, Van der Boechorststraat 7, Amsterdam, 1081BT, the Netherlands
[h] Department of Medical and Surgical Science, Bologna Transcultural Psychosomatic Team (BoTPT), Alma Mater Studiorum, Università di Bologna, Viale Pepoli 5, Bologna, 40126, Italy
[i] Department of Biomedical and Neuro-motor Sciences, Psychiatry Unit, Alma Mater Studiorum Università di Bologna, 40126, Bologna, Italy
[j] Université Clermont Auvergne, CMP-B CHU, CNRS, Clermont Auvergne INP, Institut Pascal, Clermont-Ferrand, F-63000, France
[k] Department of Research, Community Mental Health Service GGZ Noord-Holland-Noord, Heerhugowaard, the Netherlands
[l] Department of Psychosis Studies, Institute of Psychiatry, King's College London, De Crespigny Park, Denmark Hill, London, SE5 8AF, UK
[m] CAMEO Early Intervention Service, Cambridgeshire & Peterborough NHS Foundation Trust, Cambridge, CB21 5EF, UK
[n] Psylife Group, Division of Psychiatry, UCL, 6th Floor, Maple House, 149 Tottenham Court Road, London, W1T 7NF, UK
[o] Rivierduinen Institute for Mental Health Care, Sandifortdreef 19, Leiden, 2333 ZZ, the Netherlands
[p] Department of Psychiatry and Neuropsychology, School for Mental Health and Neuroscience, Maastricht University Medical Centre, P.O. Box 616, Maastricht, 6200 MD, the Netherlands

ARTICLE INFO

Handling Editor: Dr A C Tsai

Keywords:
Migrant integration policies
Psychosis
Ethnic minorities
Migration
Social determinants mental health
Eco-social epidemiology

ABSTRACT

Background: Compared with individual-level factors, macro-level exposures have received less attention in research on the increased risk of psychosis among ethnic minorities. We aimed to investigate the impact of migrant integration policies and area-level social deprivation on higher incidence rates among ethnic minorities.
Methods: This study, conducted between 2010 and 2015, analysed incidence data from five countries from the EUropean network of national schizophrenia networks studying Gene-Environment Interactions [EU-GEI]. The total population was multiplied by the duration of case-ascertainment to estimate person-years. Cases with a non-organic psychotic disorder were included. Exposures included population group (based on self/parental region of origin/self-ascribed ethnicity) and area-level exposures including country-level migrant integration policies and regional-level proxies of social deprivation (percentages of unemployment, low education, owner-occupied houses, single person-households). Negative binomial mixed-effects regression models were fitted to calculate the association between individual and area-level exposures and incidence of psychotic disorders.
Results: The study included 1933 individuals. Supportive migrant policies (IRR: 0.71; 95 % CI 0.68–0.73) and higher percentages of owner-occupied houses (IRR: 0.97; 95 % CI 0.96–0.97) were associated with lower incidence of psychosis. Higher percentages of unemployment (IRR: 1.08; 95 % CI 1.07–1.09) and single person-households (IRR: 1.10; 95 % CI 1.05–1.14) were associated with higher incidence of psychosis. Accounting

* Corresponding author.
E-mail address: e.m.a.vander.ven@vu.nl (E. van der Ven).
[1] Authors with equal contributions.

https://doi.org/10.1016/j.ssmmh.2025.100530
Received 29 March 2025; Received in revised form 12 August 2025; Accepted 15 September 2025
Available online 15 September 2025

for policies and area-level social deprivation markers reduced risk estimates among all migrant/ethnic minority groups, compared to the majority population.
Conclusions: This is the first study on the impact of migrant integration policies on psychosis incidence. Migrant integration policies and area-level social deprivation influenced psychosis risk in the overall and minority populations. These findings can inform policies and social epidemiological approaches to studying multi-level exposures in psychosis.

1. Background

An elevated incidence of psychotic disorders has long been reported for some migrant and ethnic minority populations (Radua et al., 2018). Incidence rates seem to be particularly high for racialized (non-White) minorities, and for individuals who have migrated from the Global South to Northern Europe, as is the case for Moroccan and Surinamese in the Netherlands (Selten et al., 2001), and for Black African and Black Caribbean populations in the UK (Tortelli et al., 2015). Known social determinants of psychosis such as parental separation, social disadvantage, discrimination and marginalization are experienced more frequently by some migrant and ethnic minority populations, and may partially explain their higher psychosis risk (Jongsma et al., 2021; Nielsen and Krasnik, 2010; Pearce et al., 2019).

The absolute and relative incidence of psychosis within migrant and ethnic minority populations have been shown to vary considerably across countries (Selten et al., 2020). These findings have been corroborated by the EUropean Network of National Schizophrenia Networks Studying Gene-Environment Interactions (EU-GEI) study conducted in five European countries (UK, Netherlands, Italy, Spain, France) (Termorshuizen et al., 2022). The study found a particularly high incidence of psychosis for minorities of sub-Saharan African heritage across most study sites, for those of North African heritage in the Netherlands, and Black-Caribbean heritage in the UK. Furthermore, absolute risk for the whole population, and relative risk for psychosis among migrants and ethnic minorities were lower in Spain and Italy than in the UK, France and the Netherlands. These findings imply that there may be inter-country variation in rates of psychotic disorders, notably among minority populations. These may be explained, at least partially, by meso- and macro-level environmental factors.

Social factors pertaining to the meso- and macro-level of societies, such as area-level social deprivation, are known to impact mental health, above and beyond their influence through individual-level determinants (Berkman and Kawachi, 2014; Brink et al., 2024; Macintyre et al., 2002). Most previous studies on area-level social factors in relation to minority populations have focused on the potentially protective impact of ethnic density (i.e., living in areas where one's ethnic group comprises a high proportion of the population) (Baker et al., 2021). Area-level social deprivation has been previously associated with higher psychosis risk (Brink et al., 2024; Jongsma et al., 2018; O'Donoghue et al., 2016), and minorities have been historically segregated into socially deprived areas (Anglin et al., 2021). However, the impact of area-level deprivation has yet to be explored among specific population groups. Additionally, macro-level factors, such as policies to support migrants, known to have a profound impact on their well-being and perceived health (Bilgili et al., 2015; Callens, 2015; de Freitas et al., 2018; Jeffery et al., 2024; Juárez et al., 2019), have not yet been studied for their effect on incidence of psychosis among ethnic minorities.

2. Aims

We aimed to investigate the extent to which migrant integration policies, and proxies of area-level social deprivation explain variation in incidence of psychosis among ethnic minority populations. We hypothesized that less supportive migrant policies and higher levels of social deprivation would be correlated between them and associated with higher incidence of psychosis among ethnic minority populations, via separate and compounding effects. Based on previous studies using EU-GEI data, we expected that ethnic minority population groups would have higher incidence of psychosis than the majority population (Jongsma et al., 2018) with variations across ethnic minority groups (Termorshuizen et al., 2022), but that these variations would at least be partially explained by migrant integration policy scores and proxies of area-level social deprivation.

3. Methods

3.1. Study design and settings

We analysed incidence data from the large multicentre EU-GEI study conducted between 2010 and 2015. The EU-GEI study settings include a range of rural and urban catchment areas, with two sites in the UK (Cambridgeshire, Peterborough and Southeast London), two sites in the Netherlands (Amsterdam and Gouda&Voorhout), six sites in Spain (Madrid, Barcelona, Valencia, Oviedo, Santiago and Cuenca), three sites in France (Paris, Val-de-Marne and Puy de Dôme) and three sites in Italy (Palermo, Bologna and Veneto region). Although the original incidence study also included data from Brazil, we had to exclude it as data for most area-level exposures were only available for Europe.

3.2. Participants

All individuals aged 18–64 years old presenting to specialized mental health services with a first episode of psychosis in one of the European catchment areas of the EU-GEI study were included. Exclusion criteria included a history of previous treatment with antipsychotics, or a secondary psychosis diagnosis. Cases were determined by the presence of a psychotic disorder as per ICD-10 criteria (WHO, 1992). Ethics approval was sought from relevant bodies in each catchment area, allowing for the extraction of basic demographic and clinical data from patient charts.

3.3. Outcome

The researched outcome was an ICD-10 diagnosis of a psychotic disorder (F20-F33), determined by the Operational Criteria Checklist (OPCRIT), applied to semi-structured interviews or clinical case notes (Quattrone et al., 2019). The OPCRIT has shown high reliability in previous studies (Craddock et al., 1996) and the EU-GEI study ($\kappa = 0.7$). Clinical diagnoses were used for cases where the use of OPCRIT was not possible (13.2 %). Different interview schedules were used across sites, depending on local expertise. The Schedule for Clinical Assessment in Neuropsychiatry (WHO, 1992) was used in Italy and the UK, the Comprehensive Assessment of Symptoms and History (Andreasen et al., 1992) in the Netherlands, and the Diagnostic Interview for Genetic Studies (Nurnberger et al., 1994) in France. All researchers involved in case ascertainment received similar training and regularly received supervision. This study focuses on a broad outcome instead of several specific diagnoses of psychotic disorders in alignment with recent paradigms in psychosis research, that acknowledge the dimensional and evolving nature of psychotic disorders (Reininghaus et al., 2013).

3.4. Population at risk

Following previously published EU-GEI studies (Gayer-Anderson et al., 2020), the population at risk was estimated based on local demographic data available, stratified by age (starting at 18-25 years-old, then 5-year bands until 64 years-old), sex and population group (majority population and minority populations, as defined by local categorizations) (Supplementary Table 1). To estimate person-years, total population was multiplied by the duration of case-ascertainment in years. Since in France, Spain and Italy, information on parental country of birth is not routinely collected by statistical bureaus, second-generation migrants (at least one parent born abroad) were included in the majority population group. Because this information is available in the Netherlands, first- and second-generation migrants from this country were included within minority population groups. In the UK individuals were classified as belonging to the majority or minority population groups based on self-ascribed ethnicity and country of birth.

3.5. Exposures

Data on age group (stratification used for population at risk), sex, date of assessment in study, personal and parental country of birth and self-ascribed ethnicity were collected from the MRC Sociodemographic schedule (Mallett, 1997), which was completed for all participants at baseline. Building from a previous EU-GEI incidence study (Termorshuizen et al., 2022), based on census classifications in the countries that were part of this study, we divided the minority population group into several sub-groups, based on self/parental region of origin or self-ascribed ethnicity: 1) Western countries (Europe, USA, Canada, Australia, New Zealand and countries of the former Soviet Union with a predominant Christian religion); 2) Middle East (including Turkey, Iran, Iraq, Israel and Egypt); 3) the Maghreb (North-African countries, except Egypt); 4) sub-Saharan Africa; 5) Asia (including states of the former Soviet Union with a predominant Islamic population); 6) Latin America; 7) The Caribbean islands (including Martinique and Guadeloupe, the Netherlands Antilles, Jamaica, Barbados, Trinidad and Tobago), Suriname, Guyana, French Guyana, and other French overseas departments.

Country-level migrant integration policy scores were extracted from mipex.eu. These scores (0–100) are calculated by averaging the scores on over 100 indicators regarding the rights, responsibilities and opportunities of migrants in the host country, across eight policy areas: labour market mobility, health, anti-discrimination, education, naturalisation, permanent residence, family reunification and political participation. The score attributed to each question indicates to what extent a country promoted the integration of migrants compared with the highest standards, as established by scholars/institutions in the field of comparative migrant integration policies. Higher scores indicate more supportive policies for migrants. Since its creation, four methodologically similar editions of the MIPEX [Migrant Integration Policy Index] have been published between 2007 and 2020, with intervening intervals of three to five years. We considered MIPEX 2011 (between 2007 and 2010) and 2015 (between 2011 and 2014) to cover the recruitment timeframe of the EU-GEI study. Health policy scores were not measured for these two editions. Values corresponding to total MIPEX scores were coded based on country and date of assessment of participants in this study (which ranged from 2010 to 2014). When no information was available regarding the date of assessment (22 % of participants), the scores pertaining to the 2011 MIPEX edition were used.

Regional-level (Nomenclature of Territorial Units for Statistics/NUTS-2/3 – provincial level) (Eurostat, 2024) data was extracted from the Eurostat Database (www.ec.europa.eu) for percentage of: single person households; owner-occupied houses; unemployment; and of individuals attaining less than primary, primary and lower secondary education [ISCED levels 0–2]. For the latter two variables, we were able to code individual observations by sex and population group [Majority population/Minority from an EU country/Minority from a non-EU country]), as well as by date of enrolment, matching the timeframe coding considered for MIPEX scores (see Fig. 1).

3.6. Statistical analysis

All analysis were performed using R (4.0.5). Descriptive statistics were used to characterize catchment areas and population groups with respect to the study exposures. Comparisons between groups were performed using Wilcoxon Mann-Whitney tests for continuous variables and Chi-square tests for categorical variables, and Spearman correlations were used to assess relationships between continuous exposure variables. Negative binomial mixed-effects regression models were fitted to calculate incidence rate ratios for different population groups and to estimate the effects of country-level MIPEX and of regional-level variables on incidence of psychosis. All variables of interest were entered in a full multivariable model. The order by which variables were added was based on the study hypothesis and the strength of their association with incidence in univariable analyses. Based on this study's hypothesis, an interaction term between population group and MIPEX was added to the full model. A final multivariable model was chosen using likelihood criteria (assessed via Bayesian Information Criterion). Catchment areas nested in countries were included in all models as a random effect (intercept-level), to account for the hierarchical structure of the data. Age group and sex (and their interaction) were treated as *a priori* confounders.

4. Results

4.1. Descriptive statistics

The total sample included 1933 individuals, from an original sample of 2209 individuals who enrolled in EU-GEI across all five European sites

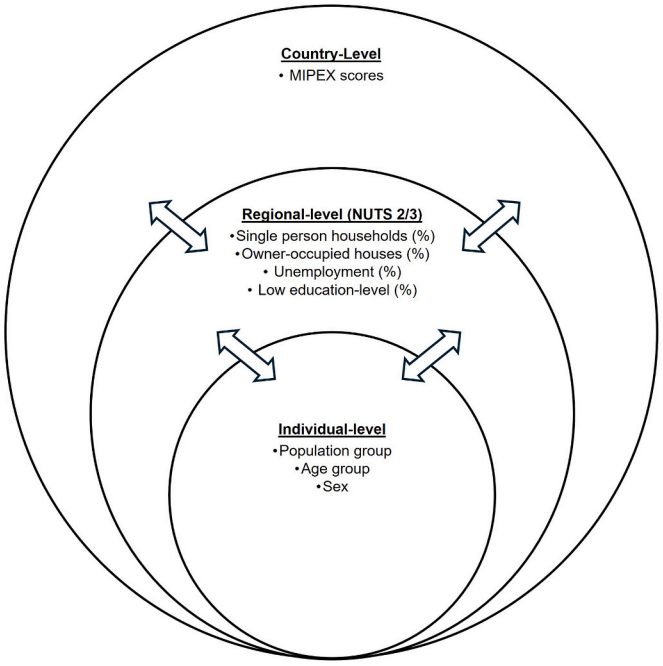

Fig. 1. Exposures at the country-, regional-, and individual-level. MIPEX scores coded by country and timeframe, as per date of assessment [2007–2010/2011–2014]; Unemployment (%) and Low education level (%) coded by region [NUTS 2/3], timeframe, as per date of assessment [2007–2010/2011–2014], Sex and Population group [Majority population/Minority EU/Minority non-EU]; Single person households (%) and Owner-occupied houses (%) coded by region [NUTS 2/3]. NUTS [Nomenclature of Territorial Units for Statistics] – provincial level (Eurostat, 2024).

(87.5 %). Participants from Puy-de-dome (N = 42) and Madrid (N = 89) were excluded due to a high percentage of missing information on population group (60 % and 34 %, respectively). Likewise, we excluded participants from Verona (N = 104) due to missing denominator information for minority population groups. An additional 41 individuals from the remaining sites were excluded for missing information on age, sex or population group, or due to the impossibility of linking a given case to a denominator, based on available data from local census. In the study sample, most were men (57.5 %); nearly half (42.9 %) belonged to minority populations, and the median age was 31.5 years (IQR = 18–64) (Tables 1 and 2).

We observed the lowest MIPEX scores in France (median = 52.5; IQR = 51–54) and the UK (median = 56.5; IQR = 56–57), and the highest in the Netherlands (median = 64.5; IQR = 61–68), Spain (median = 62.5; IQR = 61–63) and Italy (median = 59.5; IQR = 58–61). Catchment areas across Spain and Italy had the highest regional percentage of owner-occupied houses, but also the highest percentages of low education and unemployment. Catchment areas in France and the Netherlands had the highest regional percentage of single person households. Across nearly all catchment-areas, regional percentages of unemployment and low education were higher among minority populations (Table 3).

4.2. Effects of area-level variables and relative risk estimates by population group (unadjusted and adjusted models)

Higher MIPEX scores (IRR: 0.71; 95 % CI 0.68–0.73) and higher percentages of owner-occupied houses (IRR: 0.97; 95 % CI 0.96–0.97) were associated with lower incidence of psychosis for the overall study population. This indicates that a one standard-deviation increase in the MIPEX score and in the rate of owner-occupied houses is estimated to be associated with a decrease in risk of approximately 29 % and 3 %, respectively. Conversely, higher percentages of unemployment (IRR: 1.08; 95 % CI 1.07–1.09) and of single person-households (IRR: 1.10; 95 % CI 1.05–1.14) were associated with higher incidence of psychosis. Similarly, this indicates that a one-standard deviation increase in rates of unemployment and single person-households would be associated with an increase in risk of psychosis of approximately 8 % and 10 %, respectively. We did not find an association between low levels of education and incidence of psychosis (IRR 1.00; 95 % CI 0.99–1.00). Overall, these estimates held in a multivariable model, accounting for all individual-level and area-level variables (MIPEX scores, and percentages of unemployment, low education and single person households) (Table 4). We were unable to include the percentage of owner-occupied houses in the multivariable model due to high collinearity with percentage of single person households (Supplementary Table 2). We decided to retain the latter variable since this model showed a better fit.

The incidence of psychosis was higher for all minority groups compared with the majority population. This varied by population group, being higher for Sub-Saharan African (IRR: 2.72; 95 % CI 2.26–3.28), North African (IRR: 2.30; 95 % CI 1.83–2.88), Caribbean (IRR: 2.44; 95 % CI 1.99–2.98), Latin American (IRR: 2.44; 95 % CI 1.80–3.29) and Middle Eastern (IRR: 2.63; 95 % CI 1.81–3.81) minorities. Incidence rates were also elevated, although less pronounced, for minorities from Asia (IRR: 1.44; 95 % CI 1.17–1.78) and Western countries (IRR: 1.25; 95 % CI 1.06–1.48). In the multivariable model IRRs attenuated, although modestly, for Sub-Saharan African (IRR: 2.10; 95 % CI 1.57–2.80), North African (IRR: 1.76 95 % CI 1.27–2.46), Caribbean (IRR: 1.83; 95 % CI 1.32–2.52), Latin American (IRR: 1.68; 95 % CI 1.12–2.52), and Middle Eastern populations (IRR: 1.67; 95 % CI 1.02–2.72). In this model, risk estimates for Asian minorities (IRR: 0.74; 95 % CI 0.71–0.78) were significantly lower and were no longer significantly higher for Western minorities (IRR: 0.85; 95 % CI 0.66–1.10), compared to the majority population. Risk attenuation among minority populations was mostly accounted for by percentage of unemployment (Supplementary Table 3). Residual variance in incidence between catchment areas was greatly reduced in the adjusted model including individual-level variables, MIPEX scores, unemployment (%), low educational level (%) and single-person households (%) ($\sigma = 0.01$; $p < 0.001$), as compared with a null model, fitted with random effects ($\sigma = 0.21$; $p < 0.001$), and a model including individual-level variables (age, sex [and their interaction] and population group) ($\sigma = 0.12$; $p < 0.001$) (Supplementary Figs. 1 and 2).

Finally, we tested the effect of an interaction term between population group and MIPEX scores and found that higher MIPEX scores were associated with additional risk reduction among Middle Eastern (IRR: 0.57; 95 % CI 0.45–0.73), Latin American (IRR: 0.64; 95 % CI 0.48–0.84) and Asian minorities (IRR: 0.70; 95 % CI 0.60–0.83), but not for the remaining minority populations, although we were unable to reject the null hypothesis for most interaction term estimates. The association between MIPEX and psychosis risk in the model including the interaction term remained significant (IRR: 0.73; 95 % CI 0.70–0.78), suggesting a protective effect is also present for the majority population (Supplementary Table 3).

Similar results in terms of the overall effects of area-level variables and the attenuation of estimates for minority groups were obtained when analysis was conducted including the group classified as “Other minorities” (excluded from main analysis whose results are described above), using a dichotomous classification of population group (majority population/minority population) instead of specific minority groups. In this model, adding an interaction term between population group (majority population/minority population) and MIPEX showed that higher MIPEX scores were associated with higher risk reduction for minority, compared to majority groups (Supplementary Table 4).

Table 1
Sample size and demographic characteristics of the incidence sample.

Setting	Majority population, N (%)	Minority populations, N (%)	Male, N (%)	Female, N (%)	Age, median (IQR)	Total, N
London	64 (24.4)	198 (75.6)	140 (53.4)	122 (46.6)	32.0 (18–64)	262
Cambridge	149 (58.4)	106 (41.6)	145 (56.9)	110 (43.1)	28.0 (18–64)	255
Amsterdam	75 (26.9)	204 (73.1)	178 (63.8)	101 (63.8)	32.0 (18–64)	279
Gouda & Voorhout	125 (75.8)	40 (24.2)	100 (60.6)	65 (39.4)	29.0 (18–61)	165
Barcelona	80 (75.5)	26 (24.5)	62 (58.5)	44 (41.5)	29.0 (18–64)	106
Valencia	47 (83.9)	9 (16.1)	31 (55.4)	25 (44.6)	29.0 (18–60)	56
Oviedo	59 (79.7)	15 (20.3)	37 (50.0)	37 (50.0)	33.5 (18–63)	74
Santiago	35 (97.2)	1 (2.8)	21 (58.3)	15 (41.7)	33.0 (18–56)	36
Cuenca	20 (74.1)	7 (25.9)	21 (77.8)	6 (22.2)	26.0 (18–51)	27
Paris	66 (55.0)	54 (45.0)	83 (69.2)	37 (30.8)	30.5 (18–64)	120
Val - de -Marne	129 (61.7)	80 (38.3)	107 (51.2)	102 (48.8)	30.0 (18–64)	209
Bologna	116 (70.3)	49 (29.7)	86 (52.1)	79 (47.9)	30.0 (18–59)	164
Palermo	157 (88.3)	22 (12.3)	100 (55.9)	79 (44.1)	31.0 (18–63)	179
Total	1103 (57.1)	830 (42.9)	1111 (57.5)	822 (42.5)	30.0 (18–64)	1932
χ^2 (df)	405.07 (12); $p < 0.001$		25.627 (12); $p = 0.01$		31.45 (12); $p = 0.002$	

Table 2
Sample size and percentages by population group (based on [self/parental] region of origin or self-ascribed ethnicity).

Setting	Western Minorities[a], N (%)	Middle East[b], N (%)	North Africa, N (%)	Sub-Saharan Africa, N (%)	Asia, N (%)	The Caribbean, N (%)	Latin America, N (%)	Other minorities, N (%)
London	30 (11.5)	10 (3.8)		64 (24.4)	21 (8.0)	44 (16.8)		29 (11.8)
Cambridge	51 (20)	3 (1.2)		13 (5.1)	26 (10.2)	7 (2.8)		6 (2.4)
Amsterdam	37 (13.3)	14 (5.0)	31 (11.1)	27 (9.7)	19 (6.8)	65 (23.3)	11 (4.0)	
Gouda & Voorhout	8 (4.9)	2 (1.2)	18 (10.9)	3 (1.8)	4 (2.4)	1 (0.6)	4 (2.4)	
Barcelona	8 (7.6)		4 (3.8)	2 (1.9)	3 (2.8)		9 (8.5)	
Valencia	1 (1.8)		1 (1.8)	1 (1.8)			6 (10.7)	
Oviedo	4 (5.4)		2 (2.7)		1 (1.35)		8 (10.8)	
Santiago	1 (2.8)							
Cuenca	2 (7.4)		2 (7.4)				3 (11.1)	
Paris	5 (4.2)		10 (8.3)	14 (11.7)		4 (3.3)		33 (27.5)
Val-de-Marne	1 (0.5)		11 (5.3)	11 (5.3)		8 (3.8)		49 (23.4)
Bologna	15 (9.1)	1 (0.6)	8 (4.9)	4 (2.4)	17 (10.3)		4 (2.4)	
Palermo	4 (2.2)		1 (0.6)	8 (4.5)	7 (3.9)		2 (1.1)	
Total	174 (9.0)	30 (1.6)	88 (4.6)	147 (7.6)	100 (5.2)	130 (6.7)	47 (2.4)	114 (5.9)

[a] Paris and Val-de-Marne: minorities from Europe or Turkey; London and Cambridge: minorities self-identified as White Irish, Other White or Travellers; all other settings: minorities from Europe, North America, Australia and New Zealand.
[b] London and Cambridge: self-identified as Arab; all other settings: incl. Turkey, Israel, Egypt, Iran, Iraq and other countries in the Middle East region.

Table 3
Distribution of area-level variables by catchment area for ethnic minority and majority groups.

Setting	% Low educ. level[a] median (IQR)			% Unemployment[a] median (IQR)			% Owner occupied houses[b]	% Single person households	MIPEX score[d] median (IQR)
	Total	Majority population	Minority population	Total	Majority population	Minority population			
UK									56.5 (56–57)
London	18.7 (9.7–23.8)	19.6 (17.3–23.8)	18.7 (9.7–23.4)	8.9 (5.9–10.6)	7.9 (7.1–8.3)	8.9 (5.9–10.6)	35.0	35.9	
Cambridge	17.5 (15.3–30.6)	24.7 (22.4–30.6)	17.5 (15.3–30.2)	5.9 (4.9–14.8)	5.5 (4.9–6.5)	10.4 (5.1–14.8)	67.0	28.7	
The Netherlands									64.5 (61–68)
Amsterdam	34.5 (17.5–37.7)	26.5 (25.3–28.1)	34.5 (17.5–37.7)	9.8 (3.1–12.0)	4.7 (3.1–5.6)	9.8 (5.8–12.0)	46.3	41.5	
Gouda & Voorhout	38.5 (20.5–44.4)	30.3 (28.4–33.2)	38.5 (20.5–44.4)	11.1 (3.4–15.9)	5.1 (3.4–6.3)	11.1 (8.5–15.9)	58.7	33.3	
Spain									62.5 (61–63)
Barcelona	54.5 (20.3–61.3)	44.6 (39.3–47.8)	54.5 (20.3–61.3)	23.9 (9.9–38.2)	13.7 (9.9–17.5)	23.9 (11.3–38.2)	74.3	23.3	
Valencia	42.6 (32.4–56.1)	52.1 (46.9–56.1)	38.7 (32.4–43.1)	24.8 (12.6–38.0)	18.9 (12.9–24.2)	24.8 (12.6–38.0)	82.7	24.1	
Oviedo	55.1 (37.8–58.7)	43.9 (37.8–47.3)	55.1 (40.7–58.7)	24.2 (9.9–41.9)	16.1 (9.9–19.5)	30.6 (15.6–41.9)	79.9	27.2	
Santiago	49.9 (45.0–55.0)	50.3 (45.0–53.8)	49.6 (48.0–55.0)	18.8 (9.4–33.1)	15.5 (9.4–19.4)	20.9 (11.6–33.1)	77.9	22.3	
Cuenca	49.6 (37.7–61.7)	57.0 (50.6–61.7)	47.3 (37.7–51.3)	27.4 (11.0–42.5)	19.6 (11.0–29.2)	32.7 (23.7–42.5)	81.9	21.6	
France									52.5 (51–54)
Paris	42.4 (21.4–56.8)	34.1 (21.4–47.2)	42.4 (23.2–56.8)	13.1 (4.1–15.4)	7.1 (6.1–8.2)	13.5 (4.1–15.4)	47.6	35.8	
Val-de-Marne	42.4 (21.4–56.8)	34.1 (21.4–47.2)	42.4 (23.2–56.8)	13.1 (4.1–15.4)	7.1 (6.1–8.2)	13.5 (4.1–15.4)	47.6	35.8	
Italy									59.5 (58–61)
Bologna	45.2 (26.5–56.0)	39.9 (34.7–44.0)	45.2 (26.5–56.0)	11.5 (2.9–18.7)	4.8 (2.9–6.6)	11.5 (6.8–18.7)	71.4	34.4	
Palermo	56.0 (51.1–66.3)	53.9 (51.1–56.0)	56.2 (51.8–66.3)	15.3 (9.2–24.1)	17.9 (12.3–21.9)	15.3 (9.2–24.1)	70.2	28.5	
WMW[d]		*726012*[a]			*464976*[a]				
KW[d] χ^2(df)	*2933.2(12)*[a]			*2572.8(12)*[a]			*3969(12)*[a]	*3969(12)*[a]	*2997.3(4)*[a]

[a] $p < 0.05$; WMN: Wilcoxon Mann-Whitney; KW: Kruskall Wallis; IQR: interquartile range.

5. Discussion

We found that country-level migrant integration policies were associated with the incidence of psychotic disorders, with more stringent migration policies being associated with higher incidence. We also found that adjustment for policies and area-level markers of social deprivation attenuated psychosis relative risk estimates in all migrant and ethnic minority groups (between 11 % and 25 %), compared to the majority population.

5.1. The role of migrant supporting policies

Our study is aligned with previous reports indicating that immigrants in countries with restrictive migrant integration policies report lower health and (mental) well-being (Jeffery et al., 2024; Juárez et al., 2019), and higher levels of psychological symptoms in response to

Table 4
The association between minority group, country- and area-level variables, and the incidence of psychosis in crude and adjusted models [a].

Independent variables [b]	Crude univariable models IRR (95 % CI)	p value	Adjusted multivariable model[c] IRR (95 % CI)	p value
Minorities Western countries	1.25 (1.06–1.48)	0.01	0.85 (0.66–1.10)	0.22
Minorities Middle East	2.63 (1.81–3.81)	<0.001	1.67 (1.02–2.72)	0.04
Minorities North Africa	2.30 (1.83–2.88)	<0.001	1.76 (1.27–2.46)	0.00
Minorities Sub-Saharan Africa	2.72 (2.26–3.28)	<0.001	2.10 (1.57–2.80)	<0.001
Minorities Asia	1.44 (1.17–1.78)	0.001	0.92 (0.67–1.26)	0.60
Minorities the Caribbean	2.44 (1.99–2.98)	<0.001	1.83 (1.32–2.52)	<0.001
Minorities Latin America	2.44 (1.80–3.29)	<0.001	1.68 (1.12–2.52)	0.01
MIPEX total score	0.71 (0.68–0.73)	<0.001	0.74 (0.71–0.78)	<0.001
Unemployment (%)	1.08 (1.07–1.09)	<0.001	1.04 (1.02–1.06)	<0.001
Low educational level (%)	1.00 (0.99–1.00)	0.32	0.99 (0.98–1.00)	0.06
Owner-occupied housing (%)	0.97 (0.96–0.97)	<0.001		
Single person households (%)	1.10 (1.05–1.14)	<0.001	1.11 (1.08–1.15)	<0.001

[a] Dependent variable: Any diagnosis of a psychotic disorder; Random-effect intercept: catchment-areas nested in countries; Offset: person-years; [b] Continuous variables were mean centered before being entered in basic and full models; [c] Multivariable model adjusting for sex, age and their interaction, MIPEX total score, unemployment (%), low educational level (%), and single-person households (%); [d] Incidence variance by catchment-area (σ) = 0.01, $p < 0.001$. IRR: Incidence rate ratio; NOTE: This analysis (Total N = 1850) did not include individuals belonging to "Other minorities" (N = 105).

discrimination (de Freitas et al., 2018). Previous studies have found associations between the increased risk of psychosis among minority groups, marginalization/acculturation (Choy et al., 2021) and cultural distance from the host culture (Jongsma et al., 2021). While in line with these findings, our results support the argument that aspects of acculturation that play a role in the mental health of minority populations should be seen not only from the perspective of individuals, but also from that of their social, cultural and political environment. Country-level policies implemented to facilitate or regulate the integration of immigrants are likely to have a profound impact on the day-to-day realities of minority populations, as these policies set the extent to which these individuals share similar rights, responsibilities and opportunities as the general population. This may affect whether and how migrants are able to establish themselves (and their children and families) and integrate in a new country. Furthermore, policies to support migrants are shaped by local cultures, value systems, historical and socio-political contexts, and reflect a particular positioning from host countries regarding migrant and ethnic minority populations. For instance, generous migrant integration policies have been associated with positive attitudes towards migrants, namely, by increasing intergroup contact and thereby reducing the majority's perception of threat posed by immigrants (Bilgili et al., 2015). While the totality of the migrant experience is difficult to grasp quantitatively because of its complexity, country-level migration policies constitute a readily measurable aspect of migrants' reality because they define the legal and political framework within which migrants acculturate. Interestingly, we observed that living in countries with less restrictive migrant integration policies was associated with decreased incidence of psychosis for both majority and minority populations, even if this effect was more pronounced among some minority populations. One possible explanation is that larger-scale social phenomena are also at place in societies where more generous migrant integration policies are implemented. For instance, higher generalized trust, higher political stability, more investment in welfare and higher levels of community security are more frequent in countries with less restrictive migrant integration policies (Bilgili et al., 2015; Maksimović and Milosavljević, 2022; Tatarko and Jurcik, 2021).

Our findings are also consistent with previous studies reporting increased incidence of psychosis in geographical areas with higher levels of social deprivation/fragmentation (Brink et al., 2024; Jongsma et al., 2018; O'Donoghue et al., 2016). The present study adds an important nuance to previous evidence, by assessing the impact of these factors across population groups. Our results demonstrate that *proxies* of social deprivation and social fragmentation are not only associated with incidence of psychosis in the overall population, but also explain (partially) a previously reported excess incidence of psychosis among different minority populations. These results extend previous studies of the impact of social disadvantage and social defeat from the individual level to the general population (Jongsma et al., 2018; Morgan et al., 2008; Selten and Cantor-Graae, 2005; Stilo et al., 2017) and minority populations (Jongsma et al., 2021; Tarricone et al., 2021).

Among the different variables tested, percentage of unemployment was the regional factor with greatest explanatory power regarding relative risk for psychosis among minority populations. Indeed, unemployment (at the individual level) has been associated with higher incidence of psychosis and is known to be more prevalent among minority populations (Boydell et al., 2013; Mallett et al., 2002; U. A. Reininghaus et al., 2008). Importantly, however, we coded percentage of unemployment and low education not only by catchment area but also by sex, population group (majority population/minority EU/minority non-EU) and timeframe (matching the MIPEX editions considered in the study). This allowed us to have a more accurate estimate of the impact of these two *proxies* of social disadvantage on the incidence of psychosis. Notably, the use of this coding procedure (instead of considering only one single value per catchment area) produced different results compared with a previous report that had also used the EU-GEI incidence sample, where no significant effect was observed for percentage of unemployment (Jongsma et al., 2018). This indicates that in attempts to address the socioeconomic determinants of mental health, it would not suffice simply, for example, to boost employment levels in a given region without focusing on ensuring that the benefits accrue equitably to all groups, especially ones known to be disadvantaged.

Regarding the variables for which we did not have access to stratified data, we replicated the results from a previous EU-GEI incidence study (Jongsma et al., 2018) and showed that the incidence of psychosis was associated with both the percentages of owner-occupied houses and single person-households. The percentage of owner-occupied houses is a proxy of socioeconomic status or affluence and an indicator of greater cohesiveness and stability in many societies. This is also borne out by its strongly negative correlation with the percentage of single-person households, which is a proxy for social fragmentation (Jongsma et al., 2018).

5.2. *Strengths and limitations*

To our knowledge, this is the first study looking at the impact of macro-level factors on the incidence of psychosis among ethnic minority populations. It answers previous calls to extend research on individual-level social disadvantage to larger socio-environmental contexts in understanding the risk for psychosis. By shifting the focus from individual to societal factors in accounting for the risk of psychosis, our research has the potential to inform macro-level health, immigration and social

policy. We used data from a large, international incidence study, the EU-GEI, and the Eurostat and the MIPEX, two publicly available databases containing high-quality social statistics.

The EU-GEI is a treated incidence study with a first contact design. Such studies have been reported to underestimate incidence rates, as compared to population-based studies. Additionally, selection bias may vary across population groups, namely due to different pathways to care (Hogerzeil and Susser, 2017). Finally, despite efforts to homogenize case detection and ascertainment across catchment areas and the fact that services followed similar guidelines, some differences existed between the way services were organized. This may have affected the ability to detect new cases and diagnosis procedures. These potential discrepancies were minimized by the implementation of joint epidemiological training and interrater reliability protocols, the development of leakage studies and the use of semi-structured interview schedules to generate standardized diagnoses (Gayer-Anderson et al., 2020; Jongsma et al., 2018).

The criteria by which persons were categorized as being from a migrant/ethnic minority group were not uniform across sites. All jurisdictions considered individuals' and/or their parents' place of birth in determining minority status, to which the UK, notably, added self-ascribed ethnicity. However, previously published results using EU-GEI incidence data and an overlapping categorization of population group did not suggest that this coding procedure caused significant bias, as risk estimates in the UK were not identified as outliers (Termorshuizen et al., 2022). Secondly, second-generation immigrants had to be categorized as belonging to the majority population in France, Spain and Italy as is done in those jurisdictions. While this source of bias is probably minimal for Spain and Italy, where immigration waves are more recent, this might have contributed to an underestimation of incidence of psychosis among minority populations in France. Third, categorization by population group is inherently limited, as it groups together individuals with very different social, cultural and historical backgrounds. Specifically, we acknowledge that grouping together individuals from an entire continent and labelling one of the groups as "Western minorities" (which notably also includes minorities from Eastern Europe) is reductive and an important limitation of this paper. We kept this classification, however, in order to ensure consistency with labels used in previous EU-GEI papers on incidence across minority groups. Additionally, although flawed, it could be argued that these categorizations represent the ways in which statistical agencies group individuals and communities together. This in turn may reflect meaningful social constructions, that are likely to be associated with concrete consequences for the everyday lives of minoritized populations including social exclusion, discrimination and disadvantage.

Area-level variables were not collected specifically for this study but extracted from publicly available data sources. Data stratified by sex, population group and timeframe were not available for all regional variables, and these were extracted at the NUTS-2/3 level (depending on availability), which correspond to provincial territorial units that were generally larger than the study catchment areas. We were unable to include in our models several known risk factors for psychosis (migration history, drug use, parental history of psychosis, traumatic experiences) as well as markers of social disadvantage at the individual level, since these measures were not available for the incidence study. Some of these factors, whose impact has been further explored in previous EU-GEI studies using case control data, are likely to operate as intervening variables in the pathway between area-level exposures and the incidence of psychosis (Berkman and Kawachi, 2014; Blakely and Subramanian, 2006; Macintyre et al., 2002).

With respect to the MIPEX, some limitations should be noted. First, partly due to the tight timeframe of the EU-GEI study and the inclusion of only 5 countries, we were not able to account for changes in migrant policies over time or a wider range in variance, which would have helped better investigate the effect of policy on the risk of psychosis across population groups. This also means that we were unable to disentangle the effect of MIPEX from case ascertainment bias associated with differences between recruitment sites. Second, although the MIPEX score includes several indicators across policy areas, it probably does not grasp many other aspects that influence immigrants' lives in their host country. Furthermore, although the focus of MIPEX was on policies, these may not necessarily translate into concrete supports for minoritized communities. Third, whilst operating under the same policies, the geographic regions in this study may not be representative of the values (and social and political positionings) of their countries, particularly large urban centres that may have more open attitudes towards migration. Finally, as detailed data on migrant generation status was only available for a small percentage of study participants, we were unable to examine the differential impacts of migrant policies for first- and second/future-generation immigrants. The effects of migrant policies may be more pronounced for first-generation immigrants. Still, they may also influence second-/future-generation immigrants through their impacts on their parents' and grandparents' lives and therefore their upbringing. For both groups, migrant policies may influence how individuals perceive their community to be seen and supported by their host countries.

Further limitations should be noted regarding our methodology. Even though we considered several variables, we cannot exclude the possibility of residual confounding by other upstream social and political factors that could impact psychosis risk, migrant integration policies and regional-level social deprivation. Furthermore, ecological variables usually present low variability, tend to be highly correlated, and the ways in which they interact and impact psychosis are complex(Diez Roux, 2004).

6. Conclusion

In this study, we observed that country-level migrant integration policies and regional markers of social deprivation were associated with the overall incidence of psychosis and partially explained the excess incidence of psychosis among minority populations. Our results highlight the relevance of looking at social factors beyond the individual, constitute a step forward in multi-level ecological approaches in social epidemiology of psychosis and have the potential to inform policies at a wide scale.

CRediT authorship contribution statement

Salome M. Xavier: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Hannah E. Jongsma:** Writing – review & editing, Data curation. **Charlotte Gayer-Anderson:** Writing – review & editing, Resources, Investigation, Data curation. **Diego Quattrone:** Writing – review & editing, Data curation. **Sophie Blackmore:** Writing – review & editing, Formal analysis. **Ilaria Tarricone:** Writing – review & editing, Data curation. **Pierre-Michel Llorca:** Writing – review & editing, Data curation. **Eva Velthorst:** Writing – review & editing, Data curation. **Robin M. Murray:** Writing – review & editing, Data curation. **Peter B. Jones:** Writing – review & editing, Data curation. **James B. Kirkbride:** Writing – review & editing, Data curation. **Craig Morgan:** Writing – review & editing, Data curation. **Jean-Paul Selten:** Writing – review & editing, Data curation. **Els van der Ven:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Data curation, Conceptualization. **Srividya N. Iyer:** Writing – review & editing, Supervision, Project administration, Methodology, Conceptualization.

Funding

The European Network of National Schizophrenia Networks Studying Gene-Environment Interactions (EU-GEI) Project was funded by grant agreement Health-F2-2010-241909 (Project EU-GEI) from the

European Community's Seventh Framework programme. The Brazilian study was funded by grant 2012-0417-0 from the São Paulo Research Foundation. The funding source had no further role in study design, data collection and analysis, writing of the report, and in the decision to submit the report for publication. Xavier is recipient of a FCT (Fundação para a Ciência e Tecnologia) doctoral fellowship (SFRH/BD/143544/2019). Iyer was supported by the Canada Research Chairs (Tier 1) and the FRQS (Fonds de Recherche du Québec - Santé) Chercheurs-Boursiers programs. Van der Ven is supported by an NWO-ZonMw VENI grant (09150161910016). Velthorst is supported by an NIMH grant (R01MH128971).

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.

Acknowledgements

We deeply thank Dr. Giuseppe D'Andrea for comments provided regarding this study data analysis, as well as the EU-GEI WP2 Group members: Marta Di Forti, Kathryn Hubbard; Stephanie Beards, Simona A. Stilo, Giada Tripoli, Mara Parellada, Pedro Cuadrado, José Juan Rodríguez Solano, Manuel Arrojo, Angel Carracedo, Gonzalo López, Miguel Bernardo, Bibiana Cabrera, Julio Sanjuán, Esther Lorente-Rovira, Paz Garcia-Portilla, Javier Costas, Estela Jiménez-López, Mario Matteis, Marta Rapado, Emiliano González, Emilio Sánchez, Lieuwe de Haan, Bart Rutten, Nathalie Franke, Daniella van Dam, Elles Messchaart, Andrei Szöke, Marion Leboyer, Franck Schürhoff, Stéphane Jamain, Flora Frijda, Grégoire Baudin, Aziz Ferchiou, Baptiste Pignon, Jean-Romain Richard, Thomas Charpeaud, Anne-Marie Tronche, Daniele La Barbera, Caterina La Cascia, Lucia Sideli, Crocettarachele Sartorio, Laura Ferraro, Fabio Seminerio, Camila Marcelino Loureiro, Rosana Shuhama, Antonio Lasalvia, Mirella Ruggeri, Sarah Tosato, Chiara Bonetto, Doriana Cristofalo, Domenico Berardi.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmmh.2025.100530.

References

Andreasen, N.C., Flaum, M., Arndt, S., 1992. The comprehensive assessment of symptoms and history (CASH). An instrument for assessing diagnosis and psychopathology. Arch. Gen. Psychiatry 49, 615–623. https://doi.org/10.1001/archpsyc.1992.01820080023004.

Anglin, D.M., Ereshefsky, S., Klaunig, M.J., Bridgwater, M.A., Niendam, T.A., Ellman, L. M., et al., 2021. From womb to neighborhood: a racial analysis of social determinants of psychosis in the United States. Am. J. Psychiatr. 178, 599–610. https://doi.org/10.1176/appi.ajp.2020.20071091.

Baker, S., Jackson, M., Jongsma, H., Saville, C.W., 2021. The ethnic density effect in psychosis: a systematic review and multilevel meta-analysis. Br. J. Psychiatr. 219, 632–643.

Berkman, L.F., Kawachi, I., 2014. A historical framework for social epidemiology social determinants of population health. In: Berkman, L.F., Kawachi, I., Glymour, M.M. (Eds.), Social Epidemiology, secon ed. Oxford University Press, New York, pp. 1–16.

Bilgili, Ö., Huddleston, T., Joki, A.L., 2015. The dynamics between integration policies and outcomes: a synthesis of the literature. https://www.migpolgroup.com/_old/portfolio/the-dynamics-between-integration-policies-and-outcomes-a-synthesis-of-the-literature/. (Accessed 15 March 2025).

Blakely, T.A., Subramanian, S.V., 2006. Multilevel studies. In: Oakes, J.M., Kaufman, J.S. (Eds.), Methods in Social Epidemiology. Jossey-Bass, San Francisco, pp. 316–340.

Boydell, J., Bebbington, P., Bhavsar, V., Kravariti, E., Van Os, J., Murray, R.M., et al., 2013. Unemployment, ethnicity and psychosis. Acta Psychiatr. Scand. 127, 202–209. https://doi.org/10.1111/j.1600-0447.2012.01921.x.

Brink, V., Andleeb, H., Gayer-Anderson, C., Arango, C., Arrojo, M., Berardi, D., et al., 2024. The role of social deprivation and cannabis use in explaining variation in the incidence of psychotic disorders: findings from the EU-GEI study. Schizophr. Bull. 1039–1049. https://doi.org/10.1093/schbul/sbae072.

Callens, M.-S., 2015. Integration policies and public opinion: in conflict or in harmony? https://www.migpolgroup.com/_old/wp-content/uploads/2015/02/MIPEX_Literature-review_Integration-and-public-opinion.pdf. (Accessed 15 March 2015).

Craddock, N., Asherson, P., Owen, M.J., Williams, J., McGuffin, P., Farmer, A.E., 1996. Concurrent validity of the OPCRIT diagnostic system: comparison of OPCRIT diagnoses with consensus best-estimate lifetime diagnoses. Br. J. Psychiatry 169, 58–63. https://doi.org/10.1192/bjp.169.1.58.

de Freitas, D.F., Fernandes-Jesus, M., Ferreira, P.D., Coimbra, S., Teixeira, P.M., de Moura, A., et al., 2018. Psychological correlates of perceived ethnic discrimination in Europe: a meta-analysis. Psychol. Violence 8, 712–725. https://doi.org/10.1037/vio0000215.

Diez Roux, A.V.D., 2004. Estimating neighborhood health effects: the challenges of causal inference in a complex world. Soc. Sci. Med. 58, 1953–1960. https://doi.org/10.1016/S0277-9536(03)00414-3.

Eurostat, 2024. NUTS - Nomenclature of territorial units for statistics. https://ec.europa.eu/eurostat/web/nuts. (Accessed 15 March 2025).

Gayer-Anderson, C., Jongsma, H.E., Di Forti, M., Quattrone, D., Velthorst, E., De Haan, L., et al., 2020. The European network of national schizophrenia networks studying gene–environment interactions (EU-GEI): incidence and first-episode case–control programme. Soc. Psychiatr. Psychiatr. Epidemiol. 55, 645–657. https://doi.org/10.1007/s00127-020-01831-x.

Hogerzeil, S.J., Susser, E., 2017. Schizophrenia: learning about the other half. Psychiatr. Serv. 68, 425. https://doi.org/10.1176/appi.ps.68502, 425.

Jeffery, A., Gascoigne, C., Dykxhoorn, J., Blangiardo, M., Geneletti, S., Baio, G., et al., 2024. The effect of immigration policy reform on mental health in people from minoritised ethnic groups in England: an interrupted time series analysis of longitudinal data from the UK household longitudinal study cohort. Lancet Psychiatry 11, 183–192. https://doi.org/10.1016/S2215-0366(23)00412-1.

Jongsma, H.E., Gayer-Anderson, C., Lasalvia, A., Quattrone, D., Mulè, A., Szöke, A., et al., 2018. Treated incidence of psychotic disorders in the multinational EU-GEI study. JAMA Psychiatry 75, 36–46.

Jongsma, H.E., Gayer-Anderson, C., Tarricone, I., Velthorst, E., Van Der Ven, E., Quattrone, D., et al., 2021. Social disadvantage, linguistic distance, ethnic minority status and first-episode psychosis: results from the EU-GEI case–control study. Psychol. Med. 51, 1536–1548. https://doi.org/10.1017/S003329172000029X.

Juárez, S.P., Honkaniemi, H., Dunlavy, A.C., Aldridge, R.W., Barreto, M.L., Katikireddi, S.V., et al., 2019. Effects of non-health-targeted policies on migrant health: a systematic review and meta-analysis. Lancet Global Health 7, e420–e435. https://doi.org/10.1016/S2214-109X(18)30560-6.

Macintyre, S., Ellaway, A., Cummins, S., 2002. Place effects on health: how can we conceptualise, operationalise and measure them? Soc. Sci. Med. 55, 125–139. https://doi.org/10.1016/S0277-9536(01)00214-3.

Maksimović, A., Milosavljević, Z., 2022. Liberal vs restrictive concept of the EU immigration policies. Serb. J. Management 17, 439–450. https://doi.org/10.5937/sjm17-40137.

Mallett, R., 1997. Sociodemographic Schedule. Section of Social Psychiatry, vol. 183. Institute of Psychiatry, p. 35.

Mallett, R., Leff, J., Bhugra, D., Pang, D., Zhao, J.H., 2002. Social environment, ethnicity and schizophrenia: a case-control study. Soc. Psychiatr. Psychiatr. Epidemiol. 37, 329–335. https://doi.org/10.1007/s00127-002-0557-4.

Morgan, C., Kirkbride, J., Hutchinson, G., Craig, T., Morgan, K., Dazzan, P., et al., 2008. Cumulative social disadvantage, ethnicity and first-episode psychosis: a case-control study. Psychol. Med. 38, 1701–1715. https://doi.org/10.1017/S0033291708004534.

Nielsen, S.S., Krasnik, A., 2010. Poorer self-perceived health among migrants and ethnic minorities versus the majority population in Europe: a systematic review. Int. J. Public Health 55, 357–371. https://doi.org/10.1007/s00038-010-0145-4.

Nurnberger Jr., J.I., Blehar, M.C., Kaufmann, C.A., York-Cooler, C., Simpson, S.G., Harkavy-Friedman, J., et al., 1994. Diagnostic interview for genetic studies. Rationale, unique features, and training. NIMH genetics initiative. Arch. Gen. Psychiatry 51, 849–859. https://doi.org/10.1001/archpsyc.1994.03950110009002.

O'Donoghue, B., Roche, E., Lane, A., 2016. Neighbourhood level social deprivation and the risk of psychotic disorders: a systematic review. Soc. Psychiatr. Psychiatr. Epidemiol. 51, 941–950. https://doi.org/10.1007/s00127-016-1233-4.

Pearce, J., Rafiq, S., Simpson, J., Varese, F., 2019. Perceived discrimination and psychosis: a systematic review of the literature. Soc. Psychiatr. Psychiatr. Epidemiol. 54, 1023–1044. https://doi.org/10.1007/s00127-019-01729-3.

Quattrone, D., Di Forti, M., Gayer-Anderson, C., Ferraro, L., Jongsma, H.E., Tripoli, G., et al., 2019. Transdiagnostic dimensions of psychopathology at first episode psychosis: findings from the multinational EU-GEI study. Psychol. Med. 49, 1378–1391. https://doi.org/10.1017/S0033291718002131.

Radua, J., Ramella-Cravaro, V., Ioannidis, J.P., Reichenberg, A., Phiphopthatsanee, N., Amir, T., et al., 2018. What causes psychosis? An umbrella review of risk and protective factors. World Psychiatry 17, 49–66.

Reininghaus, U., Priebe, S., Bentall, R.P., 2013. Testing the psychopathology of psychosis: evidence for a general psychosis dimension. Schizophr. Bull. 39, 884–895.

Reininghaus, U.A., Morgan, C., Simpson, J., Dazzan, P., Morgan, K., Doody, G.A., et al., 2008. Unemployment, social isolation, achievement–expectation mismatch and psychosis: findings from the ÆSOP study. Soc. Psychiatr. Psychiatr. Epidemiol. 43, 743–751. https://doi.org/10.1007/s00127-008-0359-4.

Selten, J.-P., Cantor-Graae, E., 2005. Social defeat: risk factor for schizophrenia? Br. J. Psychiatry 187, 101–102. https://doi.org/10.1192/bjp.187.2.101.

Selten, J.-P., Van Der Ven, E., Termorshuizen, F., 2020. Migration and psychosis: a meta-analysis of incidence studies. Psychol. Med. 50, 303–313. https://doi.org/10.1017/S0033291719000035.

Selten, J.-P., Veen, N., Feller, W., Blom, J.D., Schols, D., Camoenie, W., et al., 2001. Incidence of psychotic disorders in immigrant groups to the Netherlands. Br. J. Psychiatry 178, 367–372. https://doi.org/10.1192/bjp.178.4.367.

Stilo, S.A., Gayer-Anderson, C., Beards, S., Hubbard, K., Onyejiaka, A., Keraite, A., et al., 2017. Further evidence of a cumulative effect of social disadvantage on risk of psychosis. Psychol. Med. 47, 913–924. https://doi.org/10.1017/S0033291716002993.

Tarricone, I., d'Andrea, G., Jongsma, H.E., Tosato, S., Gayer-Anderson, C., Stilo, S.A., et al., 2021. Migration history and risk of psychosis: results from the multinational EU-GEI study. Psychol. Med. 1–13. https://doi.org/10.1017/S003329172000495X.

Tatarko, A., Jurcik, T., 2021. Migrant integration policies, perceived group threat and generalized trust: a case of European countries. J. Int. Migrat. Integrat. 22, 705–727. https://doi.org/10.1007/s12134-020-00763-4.

Termorshuizen, F., Van Der Ven, E., Tarricone, I., Jongsma, H.E., Gayer-Anderson, C., Lasalvia, A., et al., 2022. The incidence of psychotic disorders among migrants and minority ethnic groups in Europe: findings from the multinational EU-GEI study. Psychol. Med. 52, 1376–1385. https://doi.org/10.1017/S0033291720003219.

Tortelli, A., Errazuriz, A., Croudace, T., Morgan, C., Murray, R., Jones, P., et al., 2015. Schizophrenia and other psychotic disorders in Caribbean-born migrants and their descendants in England: systematic review and meta-analysis of incidence rates, 1950–2013. Soc. Psychiatr. Psychiatr. Epidemiol. 50, 1039–1055. https://doi.org/10.1007/s00127-015-1021-6.

WHO, 1992. The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. In: World Health Organization, WHO, 2004. ICD-10: International Statistical Classification of Diseases and Related Health Problems: Tenth Revision, second ed. World Health Organization, Geneva.