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Migrant status and identification as ultra-high risk for psychosis and transitioning to a psychotic disorder

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Abstract

Background: Certain migrant groups are more likely to develop a psychotic disorder compared to the native-born populations and a younger age at migration is associated with greater risk. However, it is not known at which stage migration has an effect on the development of psychotic disorders. We examined whether migrants were more likely to be identified as ultra-high risk for psychosis (UHR) compared to native-born young people, and whether migrant status was associated with the risk of transition to a full-threshold psychotic disorder.

Methods: The cohort included all young people aged 15 to 24 who were identified as UHR at a specialist clinic over a five-year period (2012–16). Australian census data was used to obtain the at-risk population. Poisson regression was used to calculated rate ratios and Cox regression analysis determined hazard ratios.

Results: 467 young people were identified as UHR, of which 13.5%(n=63) were born overseas. First-generation migrants were 2.6-fold less likely to be identified as UHR compared to Australian-born young people (IRR=.39, 95% CI[0.30, 0.51],p<.001). There was no difference between migrant and native-born young people in their risk of transitioning to a psychotic disorder (HR=0.90,95% CI [0.39,2.08],p=.81).

Conclusions: UHR First-generation migrants may be under-accessing mental health services.

Keywords: Ultra-high risk for psychosis; UHR; Migrants; Incidence; Risk

Significant Outcomes:

- First-generation migrants in Australia were under-represented in an ultra-high risk for psychosis cohort compared to age-matched native-born young people.
- Migrant status was not associated a higher risk of transition to psychosis in the ultra-high risk cohort.

Limitations:

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- Differentiation between second-generation migrants and the native-born population could not be made due to limited documentation of parental country of birth

Data availability statement

The data used in this study is not publicly available and has not been archived in a public repository.

Conflicts of interest

The authors have no conflicts of interest to declare.

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Background

Certain migrant groups are more likely to develop a psychotic disorder compared to native-born populations and a meta-analysis has demonstrated that overall, first-generation migrants have a 2.7-fold increase in risk of developing a psychotic disorder and second-generation migrants have a 4.5-fold increase in risk (1). This trend of increased risk for migrants has been identified in countries such as the Netherlands, Denmark, Canada and England (2-5) and the risk for psychosis is higher in people from non-European countries migrating to Europe and for individuals with black skin colour (6)

Notably, individuals often experience psychotic symptoms or a functional decline well before the onset of a full-threshold psychotic disorder (7). The ultra-high risk for psychosis (UHR) criteria offers the opportunity to prospectively identify young people at a higher risk of developing a psychotic disorder. It is based on three main criteria, including sub-threshold psychotic symptoms, brief and transient full-threshold psychotic symptoms or trait vulnerability for psychosis (7-9). Over one third of individuals who are identified as UHR have been found to transition to a psychotic disorder in the subsequent three years (10), however this also means that the majority of individuals who are identified as UHR do not transition to a full threshold psychotic disorder. As a result, there has been a focus on identifying other factors which may further enhance the prediction of transition, such as the use of cannabis or the presence of other non-psychotic disorders (11, 12). However, despite migrant status being a well-established risk factor psychotic disorders, there is a paucity of research on this risk factor in the ultra-high risk for psychosis stage.

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It is known that a younger age at the time of migration is associated with a greater risk of developing a psychotic disorder, as demonstrated in the UK and Denmark (13, 14) and this indicates that early life exposure introduces this risk. However, it is not yet known whether groups with higher exposure to a known social risk factor for a psychotic disorder are proportionally represented within groups who are identified as UHR. Therefore, to conceptualise the increased risk for psychotic disorders in migrants, it could be hypothesised to be due to two factors, which may also act in unison. First, the increased risk for psychotic disorders in migrants could be due to migrants being over-represented within UHR populations. Second, there could be a greater rate of transition to a full threshold psychotic disorder from the UHR stage in migrants. Insight into the aetiology of psychotic disorders would be gained by establishing *at which point* social risk factors, such as migrant status, influence the psychosis trajectory and transition to a psychotic disorder.

This study therefore aimed to determine (a) the rate of identification of UHR for psychosis among first-generation migrants aged 15 to 24 years compared to the non-migrant population in a defined catchment area; and (b) whether migrant status is a risk factor for transitioning to a full-threshold psychotic disorder.

Methods

Setting

Orygen Youth Health (OYH) is an Australian mental health service for young people aged 15 to 24 years who reside in the northwestern suburbs of Melbourne, covering a total catchment population in excess of one million. The Personal Assessment and Crisis Evaluation (PACE) service provides care for young people in this catchment area who are identified as UHR for psychosis, using the criteria outlined below. Young people are referred to the PACE service by general practitioners, education, counselling, community health services and self-referral. Clients can attend OYH for a maximum of two years, unless they are under 16 years of age at the time of referral, in which case clients can attend until they reach the age of 18 years. At the PACE clinic, a typical episode of care for someone who is identified as UHR is between 9 and 12 months and if the person develops a first episode of psychosis, they receive the full two years of treatment.

UHR criteria

To be identified as UHR for psychosis, an individual must be help-seeking and experience at least one of the following criteria:

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1. Attenuated positive psychotic symptoms at subthreshold symptom intensity or frequency, as assessed by the Comprehensive Assessment of At-Risk Mental State (CAARMS) (15), present within the last year for at least a week.
2. Brief limited intermittent psychotic symptoms (BLIPS), referring to full-threshold psychotic symptoms that have lasted no longer than a week in the last year, and spontaneously remitted without treatment.
3. Trait vulnerability for a psychotic disorder, defined as the risk factors of schizotypal personality disorder in the identified individual or a first-degree relative with a psychotic disorder.

Individuals must also have impaired functioning, defined as either a 30% drop in Social and Occupational Functioning Assessment Scale (SOFAS) score from their previous level of functioning and sustained for a month within the past year, or a SOFAS score of 50 or less for the past 12 months or longer. The CAARMS is administered to all clients at the time of entry to service and it is used to confirm whether transition has occurred.

Design and participants

This study included all young people who met UHR criteria and attended the PACE service between 1 January 2012 and 31 December 2016, representing an epidemiological cohort of identified UHR cases of young people. Information was recorded prospectively in the clinical file by clinicians and was extracted retrospectively by researchers for this study. Typically, clients are seen weekly initially by their case-manager or doctor and this extends to fortnightly after the acute presentation. Psychotic symptoms are assessed regularly at this time and if there is a concern that the young person has transitioned to a psychotic disorder, they are reviewed by a psychiatrist and the CAARMS criteria is used to determine whether the young person is over threshold for a psychotic disorder. Demographic and clinical data was extracted from client files and electronic medical records. This study was performed in accordance with the Declaration of Helsinki and approved by the Melbourne Health Human Research Ethics Committee.

General population migrancy data

Migrant status data pertaining to the study population was collected from publicly available components of the Australian National Census, which is completed every five years. The Standard Australian Classification of Countries (SACC) was used to code participants' country of birth according to geographical areas (16). BPLP 1 classifies countries according to nine major groups (for example, 'Oceania and Antarctica') or, for some continents, into two regions (for example, 'Southern and Eastern Europe'). BPLP 2

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classifies countries within BPLP 1 according to regions (for example, 'Polynesia' or 'Southern' and 'South-Eastern Europe'). These regions consist of countries that are either geographically adjacent, or those with similarities in terms of social, political, cultural and economic factors. BPLP 3 refers to the individual country.

Data analysis

Pearson's chi-squared test (χ^2) was used to compare the demographic and clinical characteristics of migrants at UHR for psychosis compared to the Australian-born population. The first contact rates of UHR for first-generation migrants and the Australian born was calculated as the number of new cases (numerator) per the total population of young people aged 15 to 24 in the northwestern catchment area (denominator) per 100,000 people per year. The incident rate ratio (IRR) of first contact for UHR first-generation migrants was calculated using Stata Statistical Software. Poisson regression was used to determine first contact rate ratios controlled for sex and age, with age divided into two categories (15-19.9 years and 20 to 24.9 years). Cox regression analysis was used to calculate hazard ratios. The time interval was the determined by either the time to transition or time to discharge if the young person had not transitioned to a psychotic disorder. Analysis was conducted to examine the risk according to the BPLP1 categories of countries (sub-continental) and the Australian born at risk population was used as the reference variable.

Results

Description of participants

A total of 488 young people attended the PACE clinic during the study period. Seven (1.4%) of these young people were over the threshold for a psychotic disorder at the time of presentation. Furthermore, place of birth data was missing data for 14 young people (2.9%). Therefore, the remaining 467 young people were identified as UHR and included in the current cohort. Of these, 207 were male (44.3%) and the mean age was 18.7 years (*SD* = 2.8). Most of the cohort were unmarried (*n* = 437, 93.6%) and either a student (*n* = 265, 56.7%) or unemployed (*n* = 132, 28.3%). 404 young people (86.5%) were born in Australia and 63 (13.5%) were born overseas and migrated to Australia, of whom most were born in South East Asia (*n* = 16), North Africa and the Middle East (*n* = 9) and Sub-Saharan Africa (*n* = 6). The demographic characteristics of the cohort are presented in Table 1.

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The rate of identification of UHR first-generation migrants compared to Australian born participants

According to the 2011 Australian Census, there were 111,793 Australian-born people aged 15 to 24 residing in the northwestern areas of Melbourne. The number of migrants in this catchment area was 44,451. Evaluating these population figures against the study's cohort demographics on crude analysis, first-generation migrants were 2.6-fold less likely to be identified as UHR for psychosis when compared to Australian-born participants (IRR = .39, 95% CI [0.30, 0.51], p <.001). Using Poisson regression to control for sex and age, this finding remained significant (IRR=0.44, 95% C.I. 0.34 – 0.58, p<0.001). Overall, there was a significantly reduced risk of being identified as UHR for psychosis for first-generation migrants (collectively) aged 15 to 24 residing in northwestern Melbourne compared to Australian-born participants. The results of this Poisson regression are presented in Table 2 and analysis is also conducted at sub-continental region.

When controlled for age and sex, the following First-generation migrants were less likely to be identified as UHR compared to Australian born young people: New Zealand (IRR=0.36, 95% C.I. 0.13-0.97, p=0.04), South-East Asia (IRR=0.39, 95% C.I. 0.24-0.65, p<0.001), North-East Asia (IRR=0.21, 95% C.I. 0.09-0.51, p=0.001), Southern & Central Asia (IRR=0.40, 95% C.I. 0.20-0.77, p=0.006).

Association of migrant status and transitioning to a full threshold psychotic disorder

In the total cohort, 18.6% of young people (n = 87) transitioned to a full-threshold psychotic disorder over a median follow-up of 253 days (I.Q.R. 139.3 -406.8). Within the cohort of migrants, 20.6% (n = 13) transitioned to a full-threshold psychotic disorder compared to 18.3% (n = 74) of the young people born in Australia. When controlled for age and sex, there was no difference in the risk of transitioning to a psychotic disorder in first-generation migrants compared to Australian-born young people (HR = 1.15, 95% CI [0.62, 2.15], p = .65), as demonstrated in Figure 1. The rates of transition are contextualized with relative risk of first-episode psychosis (FEP) in Figure 2. Within specific migrant groups, there was no difference in the risk of transitioning to a psychotic disorder in those from New Zealand (HR=.73, 95% CI [0.10, 5.40], p=0.76], South East Asia (HR = 0.52, 95% CI [0.18, 1.44], p = .20) and North Africa and the Middle East (HR = 0.62, 95% CI [0.15, 2.55], p = .51), Southern & Central Asia (HR = 0.40, 95% CI [0.12, 1.27], p=.12) or Sub-Saharan

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Africa (HR = 0.84, 95% CI [0.11, 6.34], p=0.87). The hazard ratios for the risk of transition are presented in Table 2.

Conclusions

The key finding of this study was that first-generation migrants aged 15 to 24 years were under-represented in this UHR for psychosis cohort compared to Australian-born young people of the same age and place of residence. Moreover, it was shown that migrant status was not associated with an increased risk of transition to psychosis in the UHR cohort as compared to the Australian-born UHR individuals.

There are at least two existing studies that report the association between migrant status and the rate of UHR identification or transition to psychosis. Similar to the present findings but utilising a different cohort, O'Donoghue et al found that migrant status (first or second generation) did not influence the risk of transition to a psychotic disorder in the UHR cohort (17). Meanwhile, McGorry, Nelson (18)undertook a randomized, double blind placebo-controlled study to investigate the effect of omega-3 polyunsaturated fatty acids (ω-3 PUFA) in UHR patients in 10 international early psychosis services (18). Interestingly, that study found that collectively migrants did not have an increased risk for transitioning to a psychotic disorder, however when sub-groups were examined, it was found that non-Caucasian, native born individuals had a greater risk for transition (19). As that study was a randomized controlled trial (RCT) performed across multiple sites, it was hypothesised that this finding may have been due to differences in the risk of transition for migrants across different countries, as the Hong Kong and Singapore sites had the highest representation of non-Caucasian non-migrants and also the highest transition rates. In an Early Intervention for psychosis service in the UK, it was found that UHR individuals were more likely to be of White British ethnicity compared to controls, indicating that minorities are less likely to be detected or attend UHR clinics (20). A more recent study from the UK found that even though service users with black skin colour were more likely to be represented in UHR clinics compared to the general population, they were under-represented when compared to first episode cohorts and furthermore, ethnicity was not associated with transition to a full threshold psychotic disorder (21). Further research is merited, particularly in settings outside of Australia, to corroborate the rates of UHR identification and psychosis transition associated with migrant status. Furthermore, it needs to be ensured that the instruments used to determine UHR status and transition are culturally sensitive and applicable to migrant groups (22).

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There are several possible explanations for the reduced rate of UHR identification in first-generation migrants in this study, which all relate to a central concern: although migrants are more likely to develop a psychotic disorder compared to non-migrants, it could be that they are less likely to access mental health services (1, 23-27). Possible barriers to the seeking and use of mental health services include cultural, social, religious, geographic and economic factors (both perceived and actual costs), including the stigma of mental illness (25, 28). Moreover, migrants who have recently migrated to Australia may be unfamiliar with local public health-care systems, making it difficult to navigate them for the purpose of mental health treatment, or they may not be aware that culturally appropriate services exist (29). Together, these factors mean that it is likely that proportionally fewer migrants in the study's at-risk population were help-seeking. Given this was a necessary criterion to be considered UHR and seen in the mental health service, the actual rate of first-generation migrants who would have otherwise been considered at increased clinical risk for psychosis may have been substantially higher.

Further potential barriers are linguistic difficulties and poor mental health literacy, which can reduce access to services for young people but also reduce the diagnostic capabilities for clinicians to identify UHR individuals (30). This is complicated by cultural variations in the presentation of symptoms such as depression and anxiety; variations that may also be present in the prodrome to psychosis and reduce the detection of UHR symptoms in young people (25).

Lastly, there is evidence that first-generation migrant status is associated with a long duration of untreated psychosis (DUP) and a delay in presenting to services for treatment. Hence, migrants in this study may be less likely to present in the UHR state (31, 32). Although this has not been a consistent finding, with a study from Switzerland demonstrating no difference in the DUP between migrant and non-migrants (33). Although it has been highlighted that measures used to determine the DUP do not take into account the transcultural factors and migrants are often excluded from studies examining DUP due to exclusion criteria relating to language (22). It is also important to consider the possibility that first-generation migrants in Australia may intrinsically have a lower risk of being at UHR for psychosis and/or transitioning to a psychotic disorder when compared to the Australian-born population. The 'healthy immigrant effect' considers that migrants pass a variety of filters through the immigration process to gain migrant status, so their health may initially be superior, though it tends to worsen over time to match that of the native-born population (34, 35). In addition, the majority of studies that have demonstrated that migrants have an

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increased risk for developing psychotic disorders have mainly been conducted in Europe and the Americas. The two studies, conducted to date, in Australia have found that migrants are not at increased risk for developing a full threshold psychotic disorder (36, 37), although these studies have to be considered within their limitations, such as one including hospital admissions. Preliminary, unpublished findings indicate that migrants from African countries to Australia have an increased risk for psychotic disorders (38). Therefore, these conflicting findings and the lack of certainty as to whether to migrants have an increased risk for psychotic disorders in Australia could explain the findings of this study.

The present findings, together with the effectiveness of early psychosis services being challenged more broadly (39), raises the question of whether there should be a concerted effort in UHR criteria to ensure that future UHR populations are enriched with vulnerable groups. We suggest that early psychosis services should assertively identify at-risk migrants to reduce morbidity and mortality from mental ill-health. To do so, more information is needed regarding pathways to care. While this will differ across migrant groups and early psychosis services, it is the main avenue by which we can determine how to more quickly identify at-risk individuals.

A strength of this study was the representative epidemiological cohort of UHR individuals within a specified period and catchment area (although it is possible that not all UHR cases were identified). Another strength was that by requiring strict clinical UHR criteria for inclusion in the study, potential confounding cases with 'psychotic symptoms' or 'psychotic-like experiences' were reduced, which may have otherwise inflated the identification of UHR in the migrant population. Indeed, it is likely that we underestimated the rate of transition: due to limited documentation of parental country of birth in the records, differentiation between second-generation migrants and the Australian-born population could not be made. As many in the first-generation migrant group may have been second-generation migrants, an increase in risk of UHR identification and/or transition in second-generation migrants would reduce the relative risk of first-generation migrants.

This study showed that first-generation migrants may be under-accessing mental health services despite experiencing psychotic symptoms or a decline in functioning. Mental health services must be culturally competent to improve accessibility and utilisation of services for migrants and those who speak a language other than English, and UHR services should be assertive in identifying migrants who may be at ultra-high risk of psychosis.

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Conflict of interest

None.

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Tables

Table 1. Demographic characteristic of cohort.						
	Total cohort		**Migrant group**		**Born in Australia**	
	N	**%**	**N**	**%**	**N**	**%**
Sex						
Male	207	44.3	32	50.8	175	43.3
Female	260	55.7	31	49.2	229	56.7
Marital status						
Never married	437	93.6	62	98.4	375	92.8
Married/de facto	11	2.4	1	1.6	10	0.7
Separated/divorced	3	0.6	-	-	3	2.5
Not stated	16	3.4	-	-	16	4.0
Living status						
Alone	30	6.4	5	8.1	25	6.2
Partner	32	6.9	2	3.2	30	7.4
Friends	36	7.7	9	14.5	27	6.7
Parents	308	66.0	37	59.7	271	67.1
Other	54	11.6	9	14.5	45	11.1
Missing data	7	1.5	1	1.6	6	1.5
Employment						
Home duties	9	1.9	1	1.6	8	2.0
Unemployed	132	28.3	14	22.2	118	29.2
Employed	46	9.9	7	11.1	39	9.7
Student	265	56.7	40	63.5	225	55.7
Child not at school	6	1.3	-	-	6	1.5
Disability pension	3	0.6	-	-	3	0.7
Other	6	1.2	1	1.6	5	1.2

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Table 2. Relative risk of being identified as Ultra-high risk for psychosis in Australian-born and migrant groups.									
	N	Person-years	Incidence rate ratio - adjusted	95% CI	p	Transition N	HR	95% C.I.	p
Australian-born	404	111,793	Ref	-	-	74			
First-generation migrants*	61	44,451	0.44	0.34 – 0.58	< .001	13	1.15	0.62-2.15	0.65
New Zealand	4	16125	0.36	0.13 – 0.97	0.04	1	0.73	0.10–5.40	0.76
North-West Europe	2	10355	0.29	0.07 – 1.16	0.08	0	-	-	
Southern & Eastern Europe	3	10395	0.43	0.14 – 1.34	0.15	0	-	-	
North Africa and Middle East Africa	9	24650	0.53	0.27 – 1.02	0.06	2	0.62	0.15-2.55	0.51
South-East Asia	16	62255	0.39	0.24 – 0.65	<.001	4	0.52	0.18-1.44	0.20
North-East Asia	5	40055	0.21	0.09 – 0.51	0.001	0	-		
Southern & Central Asia	9	38960	0.40	0.20 – 0.77	0.006	4	0.40	0.12-1.27	0.12
Americas	7	5700	1.95	0.92 – 4.12	0.08	0	-		
Sub-Saharan Africa	6	10795	0.80	0.36 – 1.80	0.60	1	0.84	0.11-6.34	0.87
*To facilitate comparisons to the 'Australian born' group, the group 'Oceania and Antarctica' was separated into "Australia' and 'New Zealand' and therefore migrants born in other parts of Oceania and Antarctica (Papua New Guinea=1 and Soloman Islands = 1) were not included.									

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Figures

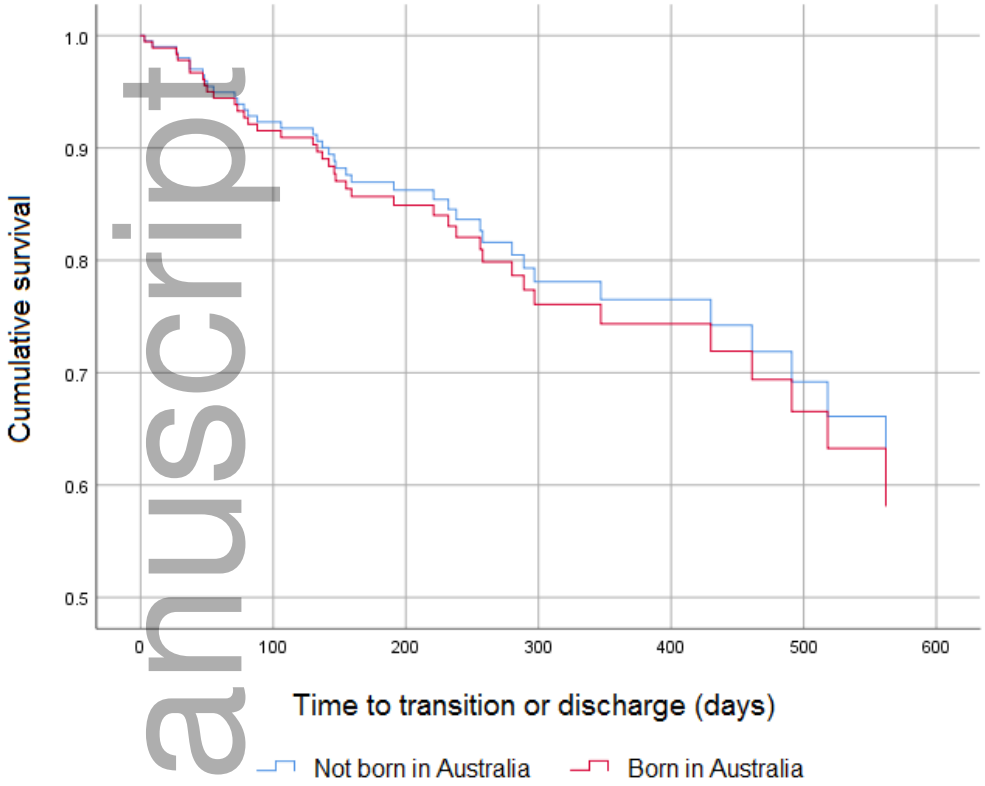


Figure 1. Cox regression analysis showing risk of transition to psychosis according to migrant status.

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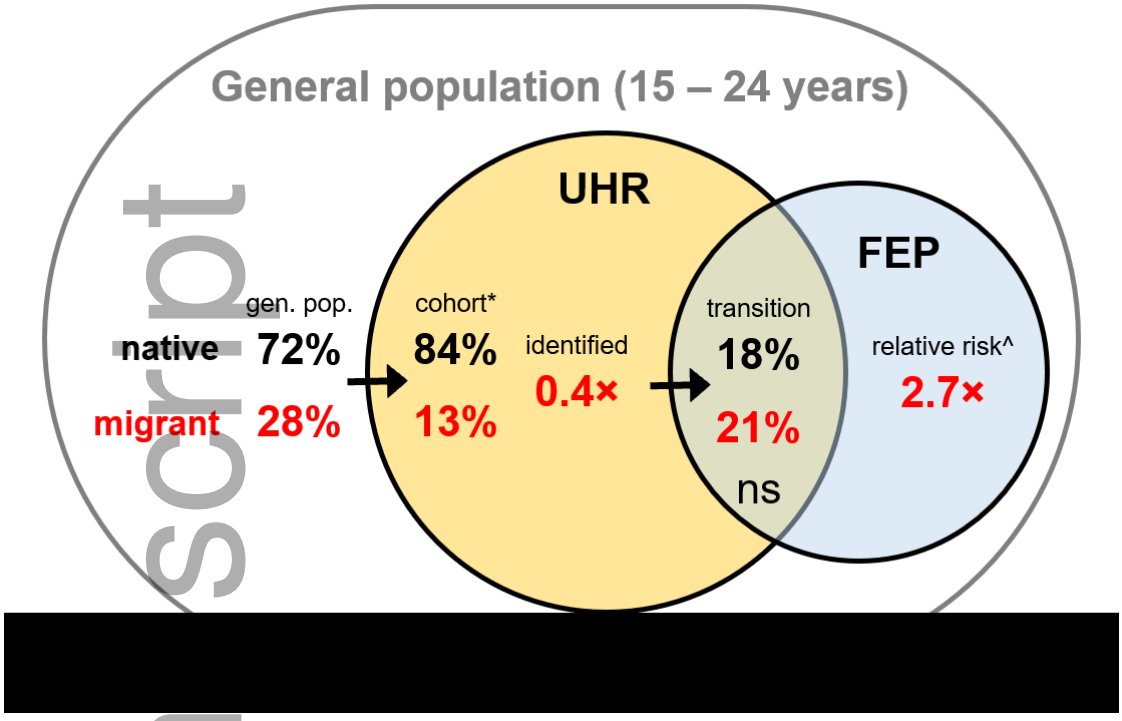


Figure 2. Young people from migrant groups in the present study's cohort were 0.4× less likely to be identified as UHR than native-born young people, yet 2.7× more likely to transition to first-episode psychosis (FEP). The relative risk of FEP for first-generation migrants, marked with an asterisk, is from Cantor-Graae and Selten (2005). ns = non-significant

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