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Differences in Clinical Presentation at First Hospitalization and the Impact on Involuntary Admissions among First-Generation Migrant Groups with Non-Affective Psychotic Disorders

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Abstract

Background: Some migrant and ethnic minority groups have a higher risk of coercive pathways to care; however, it is unclear whether differences in clinical presentation contribute to this risk. We sought to assess: (i) whether there were differences in clinician-rated symptoms and behaviours across first-generation immigrant and refugee groups at the first psychiatric hospitalization after psychosis diagnosis, and (ii) whether these differences accounted for disparities in involuntary admission. **Methods**: Using population-based health administrative data from Ontario, Canada, we constructed a sample (2009-2013) of incident cases of non-affective psychotic disorder followed for two years to identify first psychiatric hospitalization. We compared clinician-rated symptoms and behaviours at admission between first-generation immigrants and refugees and the general population, and adjusted for these variables to ascertain whether the elevated prevalence of involuntary admission persisted. **Results**: Immigrants and refugee groups tended to have lower ratings for affective symptoms, self-harm behaviours, and substance use, as well as higher levels of medication non-adherence and poor insight. Immigrant groups were more likely to be perceived as aggressive and a risk of harm to others, and both groups were perceived as having self-care issues. Adjustment for perceived differences in clinical presentation at admission did not attenuate the higher prevalence of involuntary admission for immigrant and refugee groups. **Conclusions**: First-generation migrant groups may differ in clinical presentation during the early course of psychotic illness, although these perceived differences did not explain the elevated rates of involuntary admission. Further research using outpatient samples and tools with established cross-cultural validity are warranted.

Keywords: first-episode psychosis, clinical presentation, ethnicity, migrant groups, immigrant, refugee, mental health services, health administrative data

Background

Some migrant groups with early psychosis face disparities across the continuum from onset to outcomes. Migration is a well-established risk factor for psychotic disorders, with the magnitude and direction of the association varying by the socio-political context of both the country of origin and the host country.[1] This excess risk has been shown to persist into the second- and third-generation of migrant groups,[1,2] and is particularly high for migrants who are also ethnic minorities in the host country.[1] After psychosis onset, migrant groups tend to face greater difficulties accessing mental health care, as evidenced by more negative and coercive pathways to care,[3–5] lack of timely follow-up after first diagnosis,[6,7] and longer duration of untreated psychosis.[8,9] Once treatment is initiated, migrant groups are at a greater risk of rehospitalization and involuntary admission,[5,10–12] nonadherence to antipsychotic medications[13,14] and disengagement from services,[12,15] which may have consequences for long-term outcomes, particularly for people who migrate in the context of adversity.[16]

The reasons underlying these observed disparities in service use and clinical outcomes for migrant groups with psychotic disorders are likely complex and remain poorly understood. These trends could be due to cultural differences in the manifestation of psychiatric symptoms, or in their interpretation by service providers, leading to misdiagnosis and inadequate or inappropriate treatment.[17] Indeed, prior research has shown that differences in the rates of psychotic disorders between migrant and non-migrant groups are attenuated with the use of a culturally sensitive diagnostic tool,[18] and the use of standard diagnostic procedures has been shown to lead to an under-ascertainment of affective symptoms, and an over-ascertainment of positive symptoms, among migrant groups.[19] It has also been shown that post-traumatic stress disorder and adjustment disorder may be misdiagnosed as psychotic disorder, particularly among recent migrants.[20] Although this misdiagnosis may account for a portion of the excess risk of psychotic disorder among some migrant groups, other research has shown that there may be true differences across migrant and ethnic minority groups in terms of symptoms and behaviours,[21–23] which

could help to explain some of the observed disparities in pathways to care and outcomes among migrants with psychotic disorders.

Using a large population-based health administrative dataset, we previously explored whether first-generation migrant groups in Ontario, Canada had higher rates of involuntary admission at the first psychiatric admission after psychosis diagnosis.[5] We found that migrant groups overall had higher rates of involuntary admission (RR=1.28, 95%CI=1.20,1.36), relative to the general population, with particularly high rates for migrants from Africa and the Caribbean, and for migrants who came as refugees.[5] It remains to be seen, however, whether these elevated rates of involuntary admission could be partially explained by differences in clinical presentation, whether real or perceived, at the time of first hospitalization.

In the current study, we used the same dataset to explore whether there were differences in clinical presentation across first-generation migrant groups with early psychosis at the time of first psychiatric hospitalization, and whether any observed differences could account for the excess rates of involuntary hospitalization that we previously observed.[5] Our objectives were: (1) to assess whether there were differences in clinician-rated symptoms and behaviours among first-generation migrant groups at the first hospitalization after first diagnosis of psychosis, relative to the general population; and (2) to explore whether any observed differences in clinician-rated symptoms and behaviours could partially explain the elevated risk of involuntary admission among migrant groups with psychotic disorders. As a secondary objective, we also explored whether clinician-rated symptoms and behaviours differed by country of birth.

Methods

Data Sources

We used patient-level linked health administrative data from the provincial public health insurance program in Ontario (Canada). These data were housed at ICES, which is an independent research institute whose legal status under Ontario's health information privacy laws allows it to collect and analyze

health care and demographic data, without consent, for health system evaluation and improvement. The Ontario Mental Health Reporting System (OMHRS) contains records for inpatients admitted to designated adult psychiatric beds, and also contains more detailed clinical data collected using the Resident Assessment Instrument-Mental Health (RAI-MH; www.interrai.org). Other data sources included: the Discharge Abstract Database (DAD), which contains records for all acute inpatient admissions and pediatric psychiatric admissions; the Ontario Health Insurance Plan (OHIP) Claims Database, which contains physician billing information; the National Ambulatory Care Reporting System (NACRS) for emergency department (ED) records; and the Registered Persons Database (RPDB) to ascertain socio-demographic information. We also accessed data from Immigration, Refugees, and Citizenship Canada Permanent Resident Database (IRCC-PR) to identify first-generation migrants who landed in Ontario after 1985 and their country of birth. These datasets were linked using unique encoded identifiers and analyzed on site at ICES. We followed the Reporting of studies Conducted using Observational Routinely-collected health Data (RECORD) guidelines (Supplemental Table S1).[24]

Study Sample

We identified incident cases of non-affective psychotic disorder (schizophrenia, schizoaffective disorder, or psychosis not-otherwise-specified [NOS]) aged 16 to 35 years over a five year period (2009-2013, inclusive), using the following validated algorithm[25]:

- At least one hospitalization in with a primary discharge diagnosis of non-affective psychotic disorder; or
- At least two physician or ED visits for a non-affective psychotic disorder within any 12-month period.

We looked back in the administrative data for up to 20 years prior to 2009 to exclude prevalent cases with prior contact with services for non-affective psychosis. We considered the date of first diagnosis to be the index date. We followed incident cases for up to two years following the index date to identify the first psychiatric hospitalization for any mental health reason.

We limited the sample to hospitalizations in OMHRS due to the availability of detailed clinical data from the RAI-MH, which accounted for 90% of total hospitalizations within the study cohort. In cases where the index diagnosis occurred in the context of an inpatient admission, this event was used as the first hospitalization. We excluded cases (17% of total sample) where the diagnosis changed to affective or organic psychosis at hospitalization, where the admission was made with consent of a substitute decision maker (n=59), or where the admission status was forensic or missing. We limited the sample to urban-residing cases (91% of sample), given that 99% of migrants live in urban areas, and our prior research suggests differences in patterns of health service use in rural versus urban areas.[6] We also excluded migrants from Oceania and the United States, as the numbers were too small to allow meaningful analyses (n=21). A flow chart showing the derivation of the sample and reasons for exclusion is presented in Supplemental Figure S1, and a complete list of codes used to define the study cohort and key variables is available in Supplemental Table S2.

Migrant Classification

We identified first-generation migrant groups using the IRCC-PR database. We categorized migrants based on the migrant class to which they applied, as: (i) immigrants, which include economic migrants arriving as skilled workers, and family class migrants who are joining a family member in Canada; or (ii) refugees, who are migrants unable to return to their home country due to threat of physical harm or persecution. We also classified migrant groups based on their country of birth, using categorizations from the Statistics Canada 2011 National Household Survey.[26] We further amalgamated groups for the purposes of analysis, described in detail elsewhere,[4] into the following categories: (i) European (including Northern, Southern, Western, and Eastern European countries, as well as Russia); (ii) African (including people from sub-Saharan Africa, e.g. Kenya, Ethiopia, Ghana); (iii) Caribbean (e.g. Jamaica, Cuba, Haiti); (iv) South Asian (e.g. India, Pakistan, Bangladesh); (v) East Asian (e.g. China, Japan, Philippines); (vi) Latin American (including people from Central and South America, e.g. Mexico, Argentina, Brazil); (vii) North African & Middle East (e.g. Egypt, Turkey, Syria). All remaining people in

our sample were classified as a general population reference group, which included non-migrants, second-generation or higher migrants, and those who migrated prior to 1985.

Study Outcomes

We examined clinician-rated symptom profiles and other behaviours at first hospitalization, assessed using the RAI-MH and summarized in Table 1. We used data collected from the admission assessment, which is conducted within 72 hours of admission by a member of the clinical team. Information may be obtained through interview with the patient, caregiver(s), observation of the patient, other clinical staff, and/or review of the medical records. The RAI-MH has demonstrated acceptable inter-rater reliability and convergent validity,[27–29] but has not been cross-culturally validated. The symptom and behaviour variables presented in Table 1 were summary measures generated from rating scales completed within the RAI-MH. The scales were rated based on frequency observed in the past three days, and coded as: (0) symptom/behaviour not exhibited in the last three days, (1) not exhibited in the last three days, but is reported to be present, (2) exhibited on one to two of the last three days, (3) exhibited daily over the last three days. We dichotomized scales using clinically relevant cut-offs where available, including the Depression Rating Scale,[30] Aggressive Behaviour Scale,[31] and Risk of Harm to Others Scale.[32] Where validated cut-offs were not available, we used cut-offs based on previous studies,[33,34] or used cut-offs based on similar scales. Of exception, the Global Assessment of Functioning (GAF) score was used as a continuous variable.

We identified involuntary admissions using the admission status in the OMHRS database, defined as a patient admitted under a Form 1 (Application for Psychiatric Assessment – detainment for up to 27 hours) or a Form 3 (Certificate of Involuntary Admission – detainment for up to 2 weeks, with options for renewal) according to the Ontario *Mental Health Act*. Involuntary admission is indicated under this Act when a person has been assessed by a psychiatrist and found to be suffering from a mental disorder with a high likelihood of (i) serious bodily harm to the patient; (ii) serious bodily harm to another person; or (iii) serious physical impairment of the patient if the mental disorder is left untreated.

Covariates

We obtained data on age (continuous), sex (binary), and neighbourhood-level income quintile (ordinal). Information on the preferred language for communication was obtained from OMHRS, and categorized as English and non-English. We also obtained information on the index diagnosis of psychotic disorder, categorized as schizophrenia spectrum disorder or psychosis not otherwise specified (NOS). For descriptive purposes, we also computed the time between the index diagnosis of psychotic disorder and the psychiatric hospitalization, and obtained information on the reasons for admission.

Additional covariates for our analysis of the association between country of birth and involuntary admission included variables we previously found to be associated with involuntary admission among migrant groups in our sample.[5] These included service use variables collected as part of the RAI-MH in OMHRS included police involvement in the seven days prior to admission, contact with a community-based mental health agency or outpatient clinic in the 30 days prior to admission, and at least one psychiatric admission in the past two years. We identified visits to a family physician for a mental health reason in the six months prior to admission in OHIP billing claims using a validated algorithm.[35] We also included the hospital type of the index admission (specialty psychiatric facility versus a psychiatric bed in a general hospital), and number of days from index diagnosis and hospitalization.

Data Analyses

We used standardized differences to compare the characteristics of the first-generation migrant groups to the general population, overall and stratified by country of birth. A standardized difference of greater than 0.10 is indicative of a significant imbalance between groups.[36] We used modified Poisson regression for binary outcomes to estimate prevalence ratios (PRs), and linear regression for continuous outcomes to estimate beta-coefficients (β), with variance estimators and 95% confidence intervals (CI) robust to clustering at the institution level.[37,38] We calculated unadjusted estimates, and estimates adjusted for age, sex, neighbourhood-level income quintile, and preferred language of communication (English versus other).

To explore whether any observed differences in symptoms and behaviour attenuated the elevated rates of involuntary admission that we previously observed,[5] we calculated unadjusted prevalence ratios (PR) and PRs adjusted for symptom and behaviour profiles as well as additional service-related variables found to be associated with involuntary admission[5] using modified Poisson regression models.

Patients with missing data were excluded from our regression analyses. Missing data varied by outcome - adherence had the highest proportion of missing data (10% of the sample), followed by the Global Assessment of Functioning (GAF) score (3% of the sample). Missing data in all other outcome variables accounted for <1% of the sample. All analyses were conducted in SAS Enterprise Guide (Version 6.1, SAS Institute Inc., Cary, North Carolina, USA).

Results

Sample Characteristics

We identified 4,699 incident cases of non-affective psychosis who the met the study inclusion criteria and were hospitalized within two years of the first diagnosis of psychotic disorder. Twenty-two percent of the total sample (n=1,028) were first-generation migrants, of whom 26% (n=272) were classified as refugees. The proportion of refugees varied widely by country of birth, ranging from 10% for migrants from Caribbean countries, to 52% for migrants from African countries.

The characteristics of the sample, stratified by migrant status and by country of birth, are summarized in Table 2. The mean age at index date was older for all migrant groups, compared to the general population, and people from nearly all migrant groups were less likely to reside in the highest two income quintiles. The majority of the sample received an index diagnosis of psychosis NOS, and migrants from European countries were more likely to receive this diagnosis, relative to the general population, whereas South Asian, Latin American, and North African & Middle Eastern migrants were less likely to receive a diagnosis of psychosis NOS, relative to the general population. Migrants from the Caribbean and North Africa & the Middle East had a longer time between diagnosis and first psychiatric

hospitalization. First generation migrant groups tended to differ from the general population in the reasons for admission, with lower proportions of migrants admitted as a threat to self, and higher proportions admitted as a threat to others and with an inability to care for self, relative to the general population (Table 2).

Clinician-Rated Symptoms and Behaviours among Migrant Groups

The frequencies and proportions for all clinician-rated symptoms and behaviours, stratified by migrant group, are available in Supplemental Table S3. A summary of the adjusted estimates for clinician-rated symptoms and behaviours among immigrants and refugees with early psychosis at first psychiatric hospitalization, relative to the general population, are presented in Figures 1 and 2, respectively. There were minimal differences between unadjusted and adjusted estimates, therefore we present adjusted estimates in the manuscript, and unadjusted estimates are available in Supplemental Table S4.

There was little evidence that immigrants had a higher prevalence of positive symptoms (PR=1.06, 95%CI=0.95,1.18), but some evidence of a higher prevalence among refugees (PR=1.16, 95%CI=0.97,1.40), although the 95%CI includes the possibility of a null effect. Neither immigrants nor refugees differed from the general population in the prevalence of negative symptoms (immigrants: PR=0.94, 95%CI=0.81,1.08; refugees: PR=1.07, 95%CI=0.90,1.27) of psychosis. Both groups had a lower prevalence of affective symptoms, including depression (immigrants: PR=0.89, 95%CI=0.82,0.96; refugees: PR=0.79, 95%CI=0.67,0.95) and mania (immigrants: PR=0.86, 95%CI=0.71,1.04; refugees: PR=0.71, 95%CI=0.54,0.94), relative to the general population.

Both immigrants and refugees had a lower prevalence of self-harm behaviours (immigrants: PR=0.76, 95%CI=0.64,0.91; refugees: PR=0.74, 95%CI=0.57,0.96), relative to the general population. Immigrants were more likely to be perceived as being a risk of harm to others (PR=1.13, 95%CI=1.04,1.22) and exhibiting aggressive behaviour (PR=1.20, 95%CI=1.04,1.39), whereas refugees were not (harm to others: PR=0.99, 95%CI=0.85,1.16; aggressive behaviour: PR=1.00, 95%CI=0.74,1.34). Both groups were more likely to be perceived as having issues with self-care

(immigrants: PR=1.12, 95%CI=0.98,1.28; refugees: PR=1.24, 95%CI=1.07,1.45), relative to the general population.

Both immigrants and refugees had a small but significantly higher prevalence of limited or no insight into mental illness (immigrants: PR=1.03, 95%CI=1.00,1.06; refugees: PR=1.06, 95%CI=1.02,1.10), and were more likely to be perceived as non-adherent to medication (immigrants: PR=1.13, 95%CI=1.05,1.21; refugees: PR=1.10, 95%CI=0.98,1.22), relative to the general population. Both groups had a substantially lower prevalence of substance use problems (including alcohol), relative to the general population (immigrants: PR=0.63, 95%CI=0.56,0.71; refugees: PR=0.61, 95%CI=0.50,0.75). Immigrants had a lower prevalence of prior trauma (PR=0.74, 95%CI=0.62,0.88), whereas refugees had a higher prevalence of prior trauma (PR=1.21, 95%CI=0.99,1.48), relative to the general population. There was no difference in functioning, as measured by GAF scores, between either immigrants (β=0.75, 95%CI=-0.57,2.06) or refugees (β=-0.84, 95%CI=-2.66,0.97) and the general population reference group.

Clinician-Rated Symptoms and Behaviours among Migrant Groups, by Country of Birth

The frequencies and proportions for all clinician-rated symptoms and behaviours, stratified by country of birth, are available in Supplemental Table S3. Results of the adjusted main analyses by country of birth are summarized in Table 4. Unadjusted estimates were similar to the adjusted estimates and are available in Supplemental Table S5.

The findings for the analyses stratified by country of birth were largely similar to the aggregated analyses for immigrant and refugee groups. Of exception, there is evidence that migrants from the Caribbean had a higher prevalence of both positive (PR=1.37, 95%CI=1.11,1.69) and negative (PR=1.22, 95%CI=0.97,1.53) symptoms of psychosis, whereas migrants from East Asia had a lower prevalence of negative symptoms (PR=0.70, 95%CI=0.52,0.94). Only Caribbean migrants were perceived as being a risk of harm to others (PR=1.34, 95%CI=1.17,1.54), and only European and Caribbean migrants were perceived as exhibiting aggressive behaviour (European: PR=1.34, 95%CI=1.06,1.68; Caribbean:

PR=1.35, 95%CI=1.08,1.69). Furthermore, only Caribbean and South Asian migrants were perceived as having issues with self-care (Caribbean: PR=1.30, 95%CI=1.10,1.54; South Asian: PR=1.28, 95%CI=1.04,1.59). In general, migrants from the Caribbean differed from the general population in clinician-rated symptoms and behaviours across nearly all measures considered (Table 3).

Impact of Clinician-Rated Symptoms and Behaviours on the Association with Involuntary Admission

The unadjusted prevalence of involuntary admission was higher among the European, Caribbean, South Asian, East Asian, and African groups, relative to the general population (Supplemental Table S6). After adjustment for clinician-rated symptoms and behaviours at presentation and other factors associated with involuntary admission, the African group had the highest association with involuntary admission with a 12% higher prevalence, relative to the general population (PR=1.12, 95% CI=1.05-1.18). The prevalence of involuntary admission also remained higher in the European (PR=1.08, 95%CI=1.03-1.14), Caribbean (PR=1.06, 95%CI=1.01-1.11), South Asian (PR=1.06, 95%CI=1.00-1.13) and East Asian (PR=1.06, 95%CI=1.01-1.11) groups, with minimal attenuation of association. Of exception, the association in the Caribbean group was attenuated compared to the unadjusted estimate (PR=1.13, 95%CI=1.08-1.19), but remained elevated (Supplemental Table S6).

Discussion

Our findings suggest that there may be *perceived* differences in the clinical presentation for first-generation migrant groups with early psychosis at their first psychiatric hospitalization. Migrant groups tended to have lower ratings for affective symptoms, self-harm behaviours, and substance use, as well as higher levels of medication non-adherence and lack of insight. For symptoms that may warrant involuntary admission under the Ontario *Mental Health Act*, immigrant groups were more likely to be perceived as being a risk of harm to others and to be exhibiting aggressive behaviours, and both

immigrants and refugees were perceived as having issues with self-care. Despite this, adjustment for these perceived differences in clinical presentation did not fully explain the excess rates of involuntary admission among first-generation migrant groups in Ontario. This is consistent with some prior studies on involuntary admission in migrant and ethnic minority groups,[3,39,40] but not others.[41]

A recent international systematic review and meta-analysis on involuntary psychiatric admissions among ethnic minority groups – including migrant groups – extracted information on the explanations provided by primary studies for the elevated rates observed among minority groups.[42] Many of the reasons cited by authors were unsupported by primary evidence, such as language barriers, higher rates of substance use, and socioeconomic status. Other reasons for involuntary admission cited by the authors were supported by primary evidence or mixed evidence, such as perceived risk of violence and poor insight and adherence. Although we found evidence in the current study to suggest that many of these factors are perceived to be more prevalent among migrant groups (with the exception of substance use, which was found to be lower in migrants), adjustment for these factors in multivariable models did not explain the elevated rates of involuntary admission among migrant groups that we previously observed.[5] Alternative explanations that we were unable to account for in the current study include structural racism, racial bias from healthcare providers, and alienation and mistrust of mental health services.[42] It has been hypothesized that these types of negative and coercive encounters with mental health services may lead to disengagement and relapse, thereby increasing the likelihood of further coercion and negative encounters.[43]

Our findings suggest that Caribbean groups, in particular, had the largest *perceived* differences in clinical presentation relative to the general population, as this group had significant differences across nearly all symptom and behaviour domains examined. Furthermore, involuntary admissions among the Caribbean group showed the largest attenuation in effect after adjustment for differences in clinical presentation, although the elevated rates of involuntary admission remained. We have previously shown that migrants from the Caribbean have some of the highest incidence rates of psychotic disorder in Ontario,[44] are consistently less likely to access psychiatric care surrounding the first diagnosis of

psychosis,[4,7] and have the highest risk of involuntary admission after diagnosis.[5] Interestingly, we have previously observed similar trends for migrants from African countries,[4,5,7,44] who had fewer perceived differences in clinical presentation relative to the general population, particularly for symptoms that would warrant involuntary admission under the *Mental Health Act*. In the current study, we also found that Caribbean migrants had longer time to psychiatric hospitalization after first diagnosis of psychotic disorder (median 81 days for Caribbean groups, 31 days for African groups, Table 2), and Black-Caribbean groups in Ontario have been previously found to have a longer duration of untreated psychosis.[45] These treatment delays may be contributing to the significant differences in clinical presentation for Caribbean migrants. Nevertheless, additional research is needed to better understand the factors contributing to the high rates of involuntary admission in these groups, which remain after accounting for these differences in symptoms and behaviours, as well as some service use differences.

Despite finding several significant differences in clinical presentation for immigrant and refugee groups, we found little evidence of a difference in psychotic symptoms, apart from some evidence of more severe positive symptoms in refugees. This is similar to some prior studies,[46] but in contrast to others which have found evidence that migrant groups may have more severe positive[21,23] and negative[47] symptoms. This discrepancy may be due to the fact that our sample was restricted to those who had a psychiatric hospitalization, and it might be expected that everyone included in the sample would have met a minimum threshold for symptom severity to warrant an inpatient admission. We have previously shown that migrant groups have higher admission rates in the first two years after diagnosis of a psychotic disorder – with immigrants and refugees having rates that are 25% and 47% higher than the general population, respectively.[10] Thus, migrant differences in psychotic symptoms might be more evident in the broader population of young people with early psychosis. Other studies have found differences for migrant groups for specific symptoms, such as delusions or thought disorder,[3,47,48] and there is also evidence to suggest that visible minority status explains a larger portion of the variability in psychotic symptoms and experiences than migrant status.[48,49] We did not have information available on ethnic

background or specific symptom domains, and may have therefore missed differences across migrant groups.

Limitations

Our findings are strengthened by the use of large, population-based data holdings from a public health care system that includes data on medically necessary services for nearly the entire population. Our databases also include migrants from a wide range of countries, allowing for sufficient sample sizes to examine trends by country of birth. Additionally, few prior studies have been done that are focused on the very early stages of psychotic illness – there may be differences in clinical presentation for migrant and ethnic minority groups that may evolve over the course of illness.

The most notable limitation to our findings is that the RAI-MH assessment tool used to obtain information on symptoms and behaviours has not been cross-culturally validated, and it is unknown whether there is measurement invariance across subgroups defined by migrant status or country of birth. Additionally, the clinicians completing the RAI-MH were not blinded to the migration status or ethnic background of the patient, which may have introduced observer bias. As such, our findings represent *perceived* differences in clinical presentation across migrant groups, and may have been impacted by clinician bias or a lack of cultural competence. Further research is needed to establish whether these differences remain when using culturally validated tools and blinded assessment procedures.

Our findings are also limited by the fact that second generation migrant groups and long-term residents were included in the comparison group, as we were only able to identify first-generation migrants who landed in Ontario after 1985. This may have functioned to reduce the observed differences between migrants and the general population comparison group. We also did not consider time since migration in our analyses, and migrants who have been in Canada for longer might be expected to have more familiarity and engagement with the Canadian health care system, which could have an impact on help-seeking behaviours and subsequent clinical presentation. There was also a substantial degree of ethnic and cultural heterogeneity within each of the categories used to classify country of birth, and we

do not have data available on ethnicity. This should not be inferred from country of birth, given the high likelihood of misclassification and the fact that self-report is the gold-standard for assigning ethnic background.[50]

The differences in clinical presentation we describe are present at the first hospitalization after the index diagnosis of psychotic disorder, rather than at symptom onset. The observed differences may therefore be reflective of differences in access to effective interventions for psychotic disorders, which lead to differences across groups in the severity and persistence of symptoms. We do not have information on the treatment that people received between the first diagnosis and hospitalization, particularly early psychosis intervention programs, which might be expected to differ for migrant groups and impact the clinical presentation at the time of hospitalization.[12,15] Prior analyses of the cohort used in the current study suggests that only 38% of people with a first diagnosis psychotic disorder in Ontario have a psychiatric hospitalization in the two years after first diagnosis, and that both immigrants and refugees have higher hospitalization rates.[10] As such, any observed differences in clinical presentation that we observed may not be generalizable to the broader population of people with first-episode psychotic disorder, or to those with chronic psychoses.

Finally, our sample was limited to people with non-affective psychotic disorders due to a lack of specificity in the diagnostic codes available in the outpatient billing data, which prevents the identification of affective psychotic disorders. Prior research has found evidence of a diagnostic bias, such that migrant and ethnic minority groups are more likely to receive a diagnosis of a non-affective psychotic disorder rather than an affective psychotic disorder,[22] and the differences in clinical presentation that we observed may not extend to those with affective psychoses.

Conclusions

We observed a number of differences in clinical presentation for migrant groups with first-onset non-affective psychotic disorder at their first psychiatric hospitalization after diagnosis, particularly for symptoms and behaviours that could warrant an involuntary admission under the *Mental Health Act*. Even

after accounting for these differences in clinical presentation, the elevated rates of involuntary admission among migrant groups persisted. Future research employing mixed methods designs, incorporating diverse range of perspectives, including migrants with lived experience, and using outpatient samples and culturally validated measurement tools may help to elucidate the reasons behind these pervasive and ongoing inequities for migrant and ethnic minority groups with psychotic disorders.

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The dataset from this study is held securely in coded form at ICES and the analyst (RR) had full access to study data. While data sharing agreements prohibit ICES from making the data set publicly available, access can be granted to those who meet pre-specified criteria for confidential access, available at www.ices.on.ca/DAS. The full dataset creation plan is available from the authors upon request.

Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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