Mental health care use for non-psychotic conditions by immigrants and refugees in Ontario, Canada

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Criteria for authorship:
Each of these authors:

1. made substantial contributions to: the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work;
2. drafting the work or revising it critically for important intellectual content;
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ABSTRACT

Background. Most Canadian newcomers are admitted in one of the following visa classes: 1) Economic/business–persons with needed skills; 2) Family reunification-family of Canadians or permanent resident; and 3) Refugees-persons in need of protection. The latter group reportedly has a greater risk of anxiety disorders and depression, but service use practices are not known. This study compared service use for non-psychotic mental disorders by newcomers in different visa classes and sex groups to long term residents in Ontario.

Methods. This population-based cross-sectional study linked several health service use databases to the Ontario Citizenship and Immigration Canada database. Mental health service use outcomes were visits to: 1) primary care physicians, 2) psychiatrists, and 3) emergency department visits or hospital admissions. The sample included recent immigrants (less than five years) who had arrived in Ontario from 2002 to 2007 (n=359,594). Service use by immigrants in different visa classes was compared to use by age and sex matched long term residents (i.e., Canadian-born persons or immigrants from pre-1985). For each of the three outcomes, likelihood of access and intensity of use was examined using conditional logistic regression models and negative binomial models, respectively. Models were stratified by visa class and sex.

Results. Compared to long term residents, refugees were more likely (Males--odds ratio:1.14, 95% confidence interval 1.09,1.19) or as likely (Females-1.04, 95% confidence interval 1.00,1.09) to use primary care, while economic and family class newcomers were less likely to use primary care. All immigrant visa class groups were less likely to use psychiatry or hospital services, and used less of all three service types than long term residents.

Interpretation. Recent newcomers in all visa classes generally used less mental health care for non-psychotic disorder than long term residents. One exception was that refugees were more likely than long term residents to access primary care.

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INTRODUCTION

Policy debates on immigrants and health insurance are ongoing internationally. Advocates of reduced health coverage for groups of immigrants often cite concerns that immigrants over-use services, including mental health services. (1-3) Over the past half-decade legislation restricting health coverage for specific immigrant groups has been passed in countries such as England and Wales, Spain, Australia. (4-6) These policy changes have largely not been based on evidence since there is a paucity of empirical research on immigrant mental health service use patterns, particularly in Canada. (7, 8) Moreover immigrants are often studied as one group, despite wide variation in many areas, such as visa class. (9) Research on immigrant status and pathways to care is less developed in Canada compared to other countries that have even lower percentages of immigrants, such the United Kingdom and the USA. (10-13)

Most Canadian newcomers are admitted in one of the following visa classes: 1) economic/business; 2) family reunification; and 3) refugees (See Appendix A for Statistics Canada visa class definitions and categories). Economic immigrants are selected based on their ability to become economically established, and must meet stringent admission criteria for health and occupational skills to help them contribute to the economy post migration. The other two classes (family reunification immigrants and refugees) are exempt from these criteria. Family reunification immigrants are selected because they are the relatives of Canadians and permanent residents. Refugees are admitted since they are in need of protection, often after suffering unusual stresses and traumas in past countries (e.g., war, torture, and natural disasters). (9, 14)Differences in context of exit, entrance conditions and re-settlement experiences across visa classes may affect post migration health and health service use. (15) For example, refugees may be more likely than newcomers in other visa classes to experience socioeconomic disadvantage

and worries about their family in their previous country, and have limited social support. (16-20) Despite this variation, there is a lack of literature documenting health care use patterns across visa classes. Improved information would optimally inform debates about immigration policy and provision of health services post migration.

The present study aims to: 1) describe characteristics of adult recent immigrants to Ontario by visa class and sex, and 2) compare mental health service use (primary care visits, psychiatry visits and hospital use) for non-psychotic mental disorders by recent immigrants in different visa classes and sex groups to matched long term residents (LTRs) in Ontario. Given the potential for economic immigrants to have lower health needs on arrival, we hypothesized that immigrants in the economic class would have lower use of all mental health services than LTRs. Given the potential for family reunification immigrants and refugees to have greater health needs but also face more barriers to access, we hypothesize their use of mental health hospital care would be the same or higher than LTRs.

This study was conducted in a single payer health care system where access to physician and hospital services is not directly affected by ability to pay.

METHODS

This population-based cross-sectional study uses administrative data accessed through a research agreement with Ontario's Ministry of Health and Long-Term Care. The protocol was approved by Research Ethics Boards at the University of Toronto and Sunnybrook Health Sciences Centre in Toronto. Analyses were conducted using SAS version 9.3 (SAS Institute Inc., Cary, NC, USA).

Data Sources

Immigrants were identified from the Ontario Citizenship and Immigration Canada (CIC) database, which contains individual-level demographic information recorded on the date of issue of the landing visa for Ontario's permanent residents with landing dates from 1985-2010. The CIC includes demographic and immigration characteristics including age, sex, visa category, and education level and language speaking abilities. Ontario residents are eligible for the province's single universal health care plan, Ontario Health Insurance Plan (OHIP), and they were determined from Ontario's health care registry (Registered Persons Database), which includes their age, sex and postal code. OHIP insures medically necessary care delivered by physicians and in hospital settings without user fees, co-payments or deductibles. Immigrants are eligible for this coverage after residing in Ontario for 3 months. For refugees this time is more variable, and often longer. Physician visits were determined from the OHIP database which identifies type of physician visited using specialty codes. Hospital admissions were determined from the Canadian Institute for Health Information's Discharge Abstract Database and the Ontario Mental Health Reporting System. Mental health emergency department visits were determined from the National Ambulatory Care Reporting System. To ascertain emergency department data prior to 2002, we used the location variable in OHIP claims data which identifies services delivered in the emergency department. Urban residence and income quintile were identified using Statistics Canada's Postal Code Conversion File to link patients' postal codes to census data. (21) These databases were linked in an anonymous fashion using encrypted individual identifiers.

Study populations

The immigrant sample was drawn from individuals in the CIC who arrived from 2002 to 2007. This period was chosen because starting in 2002 Canada eliminated the burden-of-illness barrier for refugees who fled their countries of origin because of well-grounded fears of

persecution. (22) The consequence of this policy change was that Canada could no longer choose not to admit specific refugees. Other eligibility requirements for the immigrant sample included being Ontario residents with OHIP coverage, aged 18-105 years, who lived in metropolitan areas. Rural populations were excluded as most immigrants settle in urban areas. (23) We also excluded those who lived in more than one country prior to immigration to Canada, whose country of origin could not be classified, who were in the 'other' visa class (~<5%), (19) or had missing data on income quintile.

Eligible LTRs were Ontario residents with OHIP coverage, aged 18-105 years, who lived in metropolitan areas, and were not listed in the CIC. LTRs were mostly Canadian-born, and also included newcomers who settled in Ontario prior to 1985.

Only those whose intended province of settlement was Ontario were included in the available CIC data. To avoid misclassifying immigrants who were not in the Ontario CIC as LTRs, individuals not in the CIC who first became eligible for OHIP after 1993 were excluded from the study.

The immigrant sample was matched to the LTR sample 1:1 on sex and birthdate. Our final sample included 359, 594 immigrants (males: 163,268; females: 196,326) of whom 99.9% were matched to LTR pairs.

Independent variables

Visa class. Most people are admitted in one of the following classes: 1) Economic class and business class are persons who bring needed skills; 2) Family reunification class are spouses, common-law partners, dependent children, and parents of Canadians or permanent resident; and 3) Refugees are persons in need of protection (See Appendix A).

Sex. All analyses were stratified by sex because females are more likely to experience depressive symptoms (24-26) and more likely use mental health services. (24, 26-29) In addition, while males are more commonly admitted as economic class immigrants, women often migrate as dependents of male relatives (e.g., in the family reunification class).

Income quintile. Neighbourhood income quintile was included as a covariate because immigrants are over-represented in disadvantaged areas, (9, 30, 31) which, in turn, are associated with lower access to mental health care. (32-34)

Service Use Outcomes

For immigrants and their age-matched LTRs, three mental health service use outcomes were measured over the same five-years following the immigrant's eligibility for OHIP: 1) visits to primary care physicians, 2) visits to psychiatrists, and 3) a composite of ED visits or hospital admissions. Short-term mental health admissions (i.e., 72 hours or less) were excluded because of limitations in the available diagnostic information. The codes in Appendix B were used to identify non-psychotic mental health primary care visits. The codes have been used in previous studies and have shown a sensitivity of 81% and a specificity of 97% for identifying mental health visits to primary care physicians. (35, 36) The OHIP database records one diagnostic code per visit. Emergency departments and hospital admission databases allow up to 16 and 25 diagnostic codes respectively, with the first being the diagnosis most responsible for the visit or admission. In the primary analysis ED visits and hospital admissions were included if any diagnosis field was related to non-psychotic mental disorders based on International Classification of Disease codes (See Appendix B). A sensitivity analysis examined hospital use where only the most responsible diagnosis was a mental health code (See Appendix C).

Statistical Analysis

Demographic characteristics were calculated for immigrants in different visa class groups and for LTRs, stratified by sex.

We modelled access (i.e., any use) using conditional logistic regression models (37) and utilization among those with any access using negative binomial models with Generalized Estimating Equations (used because of matched data). We selected negative binomial models instead of other count models after calculating predicted probabilities and comparing them to observed data. Negative binomial models best fit the data and demonstrated that the frequencies of zeroes were not beyond the fitted regression models. (38)

Sex-stratified models, adjusted for income quintile, compared care use by newcomers to use by their age-matched LTRs. These models were run for each of the following visa class groups: economic immigrants, family reunification immigrants, and refugees.

RESULTS

Among immigrants in this study (n=359,673), most entered under economic class (47.5%), with 38.2% admitted as family reunification immigrants and 14.3% admitted as refugees. Compared to females, males were more likely to enter under the economic class (53.2% versus 42.7%) and refugee class (16.1% vs 12.8%). Women were more likely to enter under family reunification class (44.5% vs 30.6%).

Those who entered in the economic class were more commonly male and had more than high school education (Tables 1a, 1b). Family reunification immigrants were generally older, female, and least likely to speak English or French. Refugees were most commonly in the most disadvantaged income quintile. Compared to immigrants, LTRs were more commonly in the most affluent income quintile.

After adjusting for income quintile, immigrants of all visa classes and sexes were generally less likely than their matched LTRs to use all types of mental health services (primary care, psychiatry, and hospital care)(Figure 1). The exceptions were male refugees, who were more likely to use primary care than LTRs (1.14 (1.09, 1.19)) and female refugees, whose likelihood of primary care use was not statistically different from LTRs (1.04 (1.00, 1.09)).

Regarding intensity of use, immigrants in all visa classes used less of each service than LTRs (Figure 2). For primary care, estimates of intensity of use were highest for refugees and lowest for economic class immigrants. For psychiatric care and hospital care, estimates were similar across visa class groups.

In the sensitivity analysis, results were compared for when mental health hospital admissions were defined using only most responsible diagnosis (sensitivity analysis) versus admissions in which mental health were responsible for any, diagnosis (primary analysis). Sensitivity analysis results were mostly consistent with all diagnoses (primary analysis). While all odds ratios were lower than those in the primary analysis, as with the primary analysis, all immigrant visa class groups were significantly different from LTRs (all p-values< 0.002). Rate ratios for intensity of visits were also similar to the primary analysis for most groups, with two exceptions -- male economic class immigrants: 0.90 (0.78, 1.04) p=0.170; male family class immigrants: 0.80 (0.61, 1.06) p=0.135) (See Appendix C for results of the sensitivity analysis.)

DISCUSSION

This study found that recent immigrants in all visa class groups generally used less mental health care than LTRs. No visa class group had greater use (access or intensity) of psychiatry or mental health hospital care – the most costly, specialized mental health service -

than LTRs. The present finding that refugees had an increased or similar likelihood of use of primary care than LTRs may be viewed as positive given that primary care is generally the preferred first line of mental health services. For example, stepped care models advise earlier use of delivery of less costly, less intense community-based services, such as primary care. (39, 40) Moreover, although this study could not assess mental health need, this group likely had more mental health need than immigrants in other groups. It is documented that compared to other immigrant groups refugees have elevated risks of non-psychotic disorders including anxiety disorders (mainly post-traumatic stress disorder) and depression. (18-20, 41, 42)

Higher levels of need among refugees likely contribute to the higher levels of initial access of primary care visits observed among males and females in this visa class. However, if need is higher, it is somewhat surprising there was not also greater use of specialty mental health services by this group. This pattern may reflect barriers to access and/or a poor understanding of specialty mental health care in Ontario. (43-50) For example in non-industrialized countries, mental health services are less numerous than in industrialized countries. They can also be more stigmatized and invasive. (51) In parts of Africa mental illness is often linked to spiritual attacks and 'treatment' can include physically harmful tactics (e.g., beating, cutting, starvation, etc.) (52-54) It is also possible that refugees feel less entitled than others to express negative opinions of care, or to advocate for referrals from primary care physicians to specialist care (55) who are often hard to access. (56) Future research should examine the follow-up of refugees who present in primary care with mental health needs after they accessed primary care.

This study found that economic class immigrants used less care than LTRs. Their estimates of use were generally the lowest among all visa class groups. This is expected given that economic class immigrants usually arrive with a health advantage after meeting screening

criteria. In Canada, eligibility for economic class immigrants is linked to employability, education, facility in official languages, and health.[1] (57) Individuals can be deemed inadmissible if there is potential for them to cause, "excessive demand on health or social services." (22) In addition, this group also includes higher percentages of males. Male immigrants and LTRs routinely who use less care than females.(58) This is one reason why it is recommended that research on mental health and care use address females separately from their male counterparts, as was done in the present study. (59)

The distribution of economic class immigrants and family class immigrants across income quintiles was generally similar, although economic class immigrants were more likely to be the in the least affluent quintile. While admission for economic class immigrants is linked to education level, experience, and arranged employment, these factors often do not equate with immediately residing in an affluent area. In fact, even though immigrants who have been in Canada for five years or less tend to be better educated than native-born persons, finding employment can be challenging -- their unemployment rate is significantly higher than that of the Canadian-born population (12.7% versus 7.4%). (60, 61) In contrast, for family class immigrants admission is linked to the sponsor's financial fitness and the immigrant's relationship to the sponsor. Sponsors for immigrants admitted in this class commit to assisting the individual until they become successfully established. In cases where the immigrant is admitted in a sub-class that requires them to cohabitate with their sponsor (i.e., for spouses, common-law relationships, or live-in care-givers), (22, 62) their income quintile is the same as their sponsor.

The high rates of English and French language speaking abilities observed among refugees may be driven mostly by two factors. First, the majority of refugees apply in the 'landed

[1] Potential immigrants to Canada, including refugees, undergo an Immigrant Medical Examination (IME) before arrival in Canada. The results of these exams are considered when determining their eligibility for admission. The IME for adults consists of a detailed medical history and physical examination that includes a chest radiography, urinalysis for protein, syphilis, and testing for HIV, and a review of mental state. (82)

in Canada' refugee category, meaning they applied while already in Canada (Males: 76.0% of refugees, Females: 64.7% of refugees). Accordingly, they may have learned some English or French prior to this application to CIC. Second, many refugees come from former British colonies (e.g., Nigeria, Ghana, and Kenya) or French colonies (e.g., Algeria, Morocco, Guinea). (63) Individuals in these countries tend be educated in English or French since most curricula were developed before countries become politically independent. (64)

Limitations. Explanations of observed findings were limited by the absence of some desired data (e.g., on ethnicity, and mental health need/severity). This report was limited to non-psychotic conditions, and its findings cannot be extrapolated to psychoses.

Important sources of support, for example from non-physician counsellors or from religious leaders, (65-67) could not be measured. Similarly, use of Community Health Centres (CHCs) in Ontario was not included. Although CHC clients have direct access to mental health community-based services without physician referrals, (68) CHCs serve a relatively small proportion of the Ontario population so their exclusion likely did not significantly bias results.

A related limitation is that mental health service use was only tracked when persons were covered by OHIP. For immigrants this coverage begins after 3 months in Ontario. However, for refugees this period is often longer, (69) meaning that for refugees the first 5 years of OHIP coverage may not immediately follow their arrival in Ontario. However, according to the healthy immigrant effect, differences between immigrants and non-immigrants diminish with increased time in the host country, and immigrant use of services increases. If the same applies to refugees, the proposed studies may under-estimate differences between recent refugees and LTRs**.**

The CIC does not include immigrants who entered Ontario from a different province; refugee claimants who have not been accepted or are appealing; other temporary residents/workers/visitors; or 'non-status' residents. In addition, this study analyses did not

account for heterogeneity within visa classes. Future research should examine immigrants excluded from this study using different data sources, and examine drivers of heterogeneity within visa class groups.

In spite of these limitations, the study has a number of strengths. The use of population-level health services data linked to immigration data allowed examination of mental health care use by immigrants in different visa groups relative to standard comparators (LTRs). Matching immigrants to LTRs on matched on age and sex helped control for two important sources of variation in mental health care use. In addition, this study used standard inclusion criteria, methodology, and outcome definitions across different visa classes. Use of administrative data sources distinguished this study from most work on immigrant mental health that uses survey-derived data. In addition to including missing information, self-report data can be affected by recall, reporting and selection biases. (70-73) Under-reporting of service use is particularly common among individuals with mental health disorders. (74, 75) Another strength was that this study focused on immigrants within their first five years after arrival. During this period immigrants routinely deal with re-settlement challenges (e.g. missing country of origin, underemployment, and language difficulties).

Conclusion

While examining immigrants by visa class, this study found no evidence of excessive use of care for non-psychotic mental health conditions by recent newcomers in any visa class. These findings address a knowledge gap related to use of health care by immigrants in different visa class groups, and particularly refugees–an issue that has garnered policy attention worldwide. (2, 5-6, 76-78)

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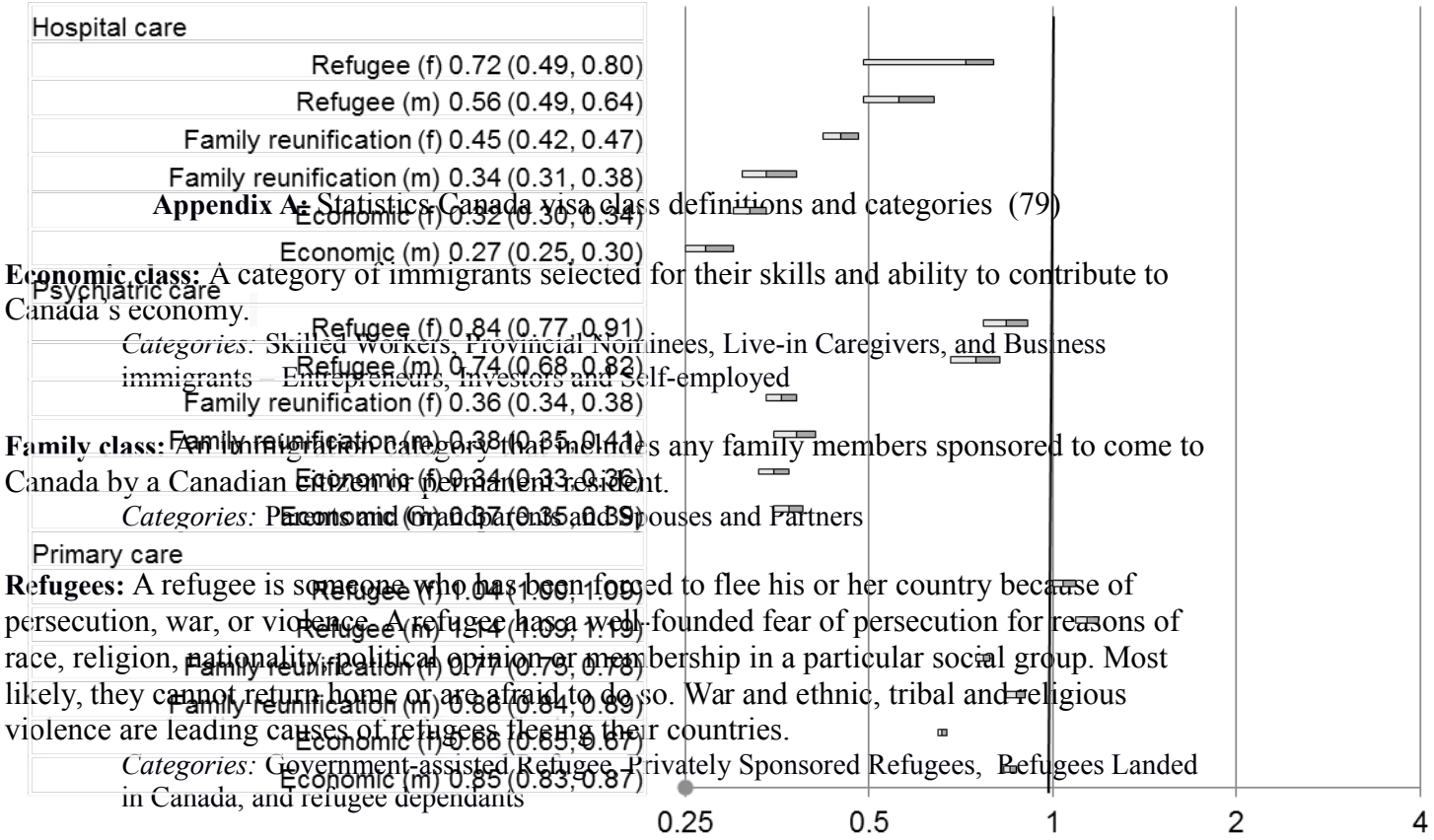
Table 1. Characteristics of male and female adult immigrants to Ontario Canada who arrived from 2002-2007 and were admitted in the economic/business, and family reunification classes and as refugees and characteristics of their matched long term residents[‡] in urban Ontario, by sex.

		Immigrant visa class groups[†]		Long term residents[‡]		
		Economic/ Business	**Family Reunification**	**Refugee**	**Total immigrants[§]**	
			Males			
	N (%)	86,933 (53.2)	50,015 (30.6)	26,350 (16.1)	163,298 (100.0)	163,268
Age at arrival	Mean ± SD	35.48 ± 8.33	39.88 ± 16.79	34.75 ± 11.12	36.71 ± 12.15	
	Median (IQR)	35 (30-41)	33 (26-55)	33 (26-42)	34 (28-43)	
Income quintile	1 (least affluent)	33,624 (38.7)	15,317 (30.6)	13,487 (51.2)	62,428 (38.2)	29,151 (17.9)
	2	20,381 (23.4)	12,878 (25.7)	6,456 (24.5)	39,715 (24.3)	32,680 (20.0)
	3	14,520 (16.7)	10,089 (20.2)	3,434 (13.0)	28,043 (17.2)	33,356 (20.4)
	4	10,649 (12.2)	7,138 (14.3)	1,985 (7.5)	19,772 (12.1)	34,282 (21.0)
	5 (most affluent)	7,759 (8.9)	4,593 (9.2)	988 (3.7)	13,340 (8.2)	33,794 (20.7)
Highest level of education	More than high school	76,694 (88.2%)	23,844 (47.7%)	10,623 (40.3%)	111,161 (68.1%)	
	High school	9,321 (10.7%)	24,467 (48.9%)	14,988 (56.9%)	48,776 (29.9%)	
	None	918 (1.1%)	1,704 (3.4%)	739 (2.8%)	3,361 (2.1%)	
Language speaking abilities	English or French	67,420 (77.6%)	29,631 (59.2%)	20,921 (79.4%)	117,972 (72.2%)	
	Neither	19,513 (22.4%)	20,384 (40.8%)	5,429 (20.6%)	45,326 (27.8%)	
			Females			
	N (%)	83,809 (42.7)	87,370 (44.5)	25,196 (12.8)	196,375 (100.0)	196,326
Age at arrival	Mean ± SD	34.13 ± 7.82	37.10 ± 15.88	35.96 ± 12.15	35.69 ± 12.62	
	Median (IQR)	34 (29-39)	30 (25-50)	34 (27-43)	33 (27-42)	
Income quintile	1 (least affluent)	31,628 (37.7)	28,634 (32.8)	13,336 (52.9)	73,598 (37.5)	35,087 (17.9)
	2	19,207 (22.9)	22,550 (25.8)	5,820 (23.1)	47,577 (24.2)	38,898 (19.8)
	3	13,933 (16.6)	16,608 (19.0)	3,170 (12.6)	33,711 (17.2)	39,912 (20.3)
	4	10,529 (12.6)	12,033 (13.8)	1,917 (7.6)	24,479 (12.5)	41,439 (21.1)
	5 (most affluent)	8,512 (10.2)	7,545 (8.6)	953 (3.8)	17,010 (8.7)	40,990 (20.9)
Highest level of education	More than high school	68,614 (81.9%)	42,911 (49.1%)	9,104 (36.1%)	120,629 (61.4%)	
	High school	13,951 (16.6%)	39,530 (45.2%)	14,206 (56.4%)	67,687 (34.5%)	
	None	1,244 (1.5%)	4,929 (5.6%)	1,886 (7.5%)	8,059 (4.1%)	
Language speaking abilities	English or French	57,877 (69.1%)	47,113 (53.9%)	17,234 (68.4%)	122,224 (62.2%)	
	Neither	25,932 (30.9%)	40,57 (46.1%)	7,962 (31.6%)	74,151 (37.8%)	

† P-values assessed the differences in across immigrants from different visa class groups, and compared total immigrants to long term residents. All p-values were <0.001
‡ Long term residents were Canadian-born or immigrants who arrived in Ontario prior to 1985
§ Immigrants who were in the 'other' visa class (~<5%) were excluded.

Figure 1. Any mental health care use for non-psychotic disorders by adult immigrants in different visa classes (economic, family reunification, and refugees) within 5 years of arrival in Ontario from 2002-2007, compared to their matched long term residents in urban Ontario, by sex.



Appendix A: Statistics Canada visa class definitions and categories (79)

Economic class: A category of immigrants selected for their skills and ability to contribute to Canada's economy.

Categories: Skilled Workers, Provincial Nominees, Live-in Caregivers, and Business immigrants – Entrepreneurs, Investors and Self-employed

Family class: An immigration category that includes any family members sponsored to come to Canada by a Canadian citizen or permanent resident.

Categories: Parents and Grandparents, and Spouses and Partners

Refugees: A refugee is someone who has been forced to flee his or her country because of persecution, war, or violence. A refugee has a well-founded fear of persecution for reasons of race, religion, nationality, political opinion or membership in a particular social group. Most likely, they cannot return home or are afraid to do so. War and ethnic, tribal and religious violence are leading causes of refugees fleeing their countries.

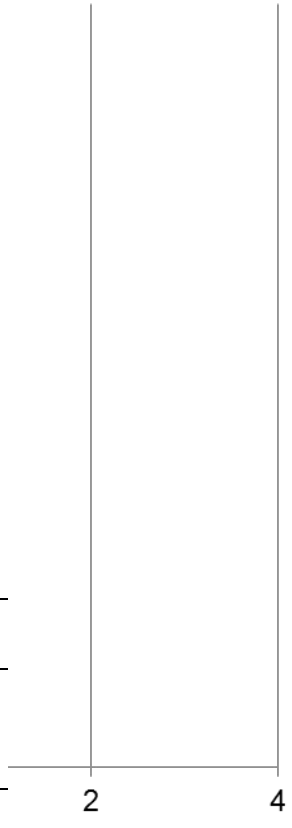
Categories: Government-assisted Refugee, Privately Sponsored Refugees, Refugees Landed in Canada, and refugee dependants

Other immigrants: Humanitarian and Compassionate/Public Policy Considerations **(excluded)**

† Odds ratios were determined from conditional logistic regression models. Models were adjusted for income quintile and stratified by visa class and by sex

‡ Hospital use was defined as emergency department visits or admissions

ılt immigrants in
ı Ontario from 2002-



egative binomial
class and by sex

Immigration class	Category 2	Statistics Canada code and classification	
Family Class (FC)	FC Spouses	FC1	Spouse
		FCC	Common Law Partner
		FCE	Conjugal Partner
		SP1	Husband or Wife - 1952 Act 31(1)(a)
	FC Parents and Grandparents	FC4	Parents and Grandparents
		FC8	Parent of Canadian Citizen
		AR3	Parent
		AR2	Grandparent

		SP4	Par./Grndpar. over 60, or inc.,Wid if und. 60
	FC Others	FC2	Fiance(e)
		FC3	Son or Daughter
		FC5	Orphan
		FC6	Child to be adopted
		FC7	Other Relative
		FC9	Child adopted by Canadian
		SP2	Fiance(e) & acc. Unmar. Child under 21 31(1)(b)
		SP3	Unmar. son or Daughter under21 31(1)(c)
		SP5	Orp. Nep., Niece, Grndchld, Brot., Sis., under 18
		SP6	Unm. Adop. Chil. under 21 who were adop. under 18
		SP7	Aband. Child or Orp. under 13 to be adopted
		SP8	Rel. & Acc. Fam. other than 31(1)(c) ro (1)(f)
		FCA	Simple Adoption
		FCB	Guardianship
		FCD	De facto
	Public Policy	FCH	Family Relationships - Humanitarian and Compassionate
Economic	Business	NV1	Private Business Individual
		NV2	Private Business Group
		NV3	Private Syndicate
		NV4	Venture Capital Fund
		NV5	
		EN2	Entrepreneur
		PR2	Entrepreneur, provincial sponsor
		EN3	Entrepreneur and Acc. Dep. 1952 Act 32(3)
		SE2	Self-Employed
	Skilled Workers	SW1	Skilled Worker
		ND2	Independent
		ND3	Independent with Canadian Relative
		ND3	Independent with Canadian Relative

		AR1	Brother or Sister
		AR4	Son or Daughter
		AR5	Unmarried Niece or nephew under 21
		AR6	Married Niece, Nephew, Aunt or Uncle over 21
		AR7	Other Assisted Relative
		NR1	Son, Daug. over 21 & Acc. Imm. Family 33(1)(a)
		NR2	Married son, Daug. under 21 and Acc. Family
		NR3	Brot. & Sis. & Accom. Imm. Family
		NR4	Par. & Grndpar. under 60 & Accom. Imm. Faily
		NR5	Nep.,Niece, Unc., Aunt, Grndchld & Accom. Imm. Family
		LC1	Live-in Caregiver
		LC2	Dependant Abroad of LCP
	Canadian Experience Class	CE1	Canadian Experience Class - Worker
		CE2	Canadian Experience Class - Student
	Provincial Nominees	PV2	Provincial Nominees Overseas
	Permit Holders	PH1	Permit holders applying for perm. residence
Resettlement	Gov't-assisted Refugees	CR1	Government Assistance Required
		CR5	Special Needs
		DC1	Government Assistance Required
		DC5	Special Needs
		RS1	Government Assistance Required
		RS5	Special Needs
		RA5	Special Needs
		PTR	Protected Temporary Resident
	Private Refugees	CR2	Convention Refugee Family
		CR3	Convention Refugee Private
		CR4	Convention Refugee Self Supporting
		CRX	Convention Refugee private (24 months)
		DC2	Designated Class Family
		DC3	Designated Class Private

		DC4	Designated Class Self Supporting
		RS3	Reset. Source Private
		RS4	Reset. Source Self Supporting
		RSX	Reset. Source Private (24 months)
		RA3	Reset. Asylum Private
		RA4	Reset. Asylum Self Supporting
		RAX	Reset. Asylum Private (24 months)
		CRS	Convention Refugee Abroad sponsored by SAH
		CRC	Convention Refugee Abroad with Community Sponsorship
		CRG	Convention Refugee Abroad sponsored by Group of five
		RSS	Source Country sponsored by SAH
		RSC	Source Country with a Community Sponsorship
		RSG	Source Country sponsored by Group of five
		RAS	Country of Asylum sponsored by SAH
		RAC	Country of Asylum with a Community Sponsorship
		RAG	Country of Asylum Sponsored by Group of Five
Refugee Dependants	Refugee Dependants	CR6	Dependant of New CR1
		CR7	CR by RSAC or IRB
		CR9	Dependant of Convention Refugee
		DC6	Dependant of New CR1
		DR1	Dependant of CR8 Refugee in Canada
		DR2	Dependant of CR8 Refugee Abroad
	In-Canada Refugees	CR8	In-Canada Refugees
Other		HC1	Humanitarian and Compassionate Case
		PP1	Public Policy
	H & C / Public Policy	HC2	Sponsored H & C Application outside the Family Class
	Retired	RE2	Retired
		PD1	Post-determination Refugee Claimant

	Post-determination Refugee Claimant	PD2	Dependant abroad of Post-determination Refugee Claimant
	Deferred Removal Order Class	RM1	Deferred Removal Order Class
		RM2	Dependant Abroad of Deferred Removal Order Class
Backlog	Backlog	DC8	Backlog

APPENDIX B:

OHIP Diagnostic Codes (International Classification of Disease -9) Non Psychotic Disorders

300 anxiety neurosis, hysteria, neurasthenia, obsessive – compulsive neurosis, reactive depression, 301 personality disorders, 302 sexual deviations, 303 alcoholism, 304 drug dependence, 306 psychosomatic illness, 307 tics, anorexia nervosa 309 adjustment reaction, 311 depressive disorder, 897 economic problems, 898 marital difficulties, 899 parent- child problems 900 problems with aged parents or in-laws, 901 family disruption/ divorce, 902 education problems, 903 ilegitimacy, 904 social maladjustment, 905 occupational problems, 906 legal problems ,909 other problems of social adjustment

APPENDIX C: Results of the sensitivity analysis – predicting hospital admissions or Emergency Department admissions with most responsible diagnosis

		Primary analysis (any diagnosis)	Sensitivity analysis (most responsible diagnosis)
Odds ratios of any hospital use			
Refugee	Male	0.56 (0.49, 0.64)	0.38 (0.23, 0.62)
	Female	0.72 (0.49, 0.80)	0.83 (0.75, 0.93)
Family	Male	0.34 (0.31, 0.38)	0.26 (0.17, 0.91)
	Female	0.45 (0.42, 0.47)	0.32 (0.25, 0.40)
Economic	Male	0.27 (0.25, 0.30)	0.16 (0.11, 0.22)
	Female	0.32 (0.30, 0.34)	0.22 (0.17, 0.28)
Rate ratios for intensity of hospital uses among users			
Refugee	Male	0.75 (0.64, 0.87)	0.80 (0.65, 0.98)
	Female	0.76 (0.67, 0.85)	0.56 (0.41, 0.79)
Family	Male	0.67 (0.59, 0.76)	0.80 (0.61, 1.06)
	Female	0.67 (0.62, 0.72)	0.82 (0.70, 0.97)
Economic	Male	0.71 (0.66, 0.76)	0.90 (0.78, 1.04)

Female	0.64 (0.58, 0.70)	0.84 (0.72, 0.99)