

Building Knowledge About Health Services Utilization by Refugees

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Abstract The objective of this study was to compare the utilization of outpatient physician, emergency department and hospital services between refugees and the general population in Calgary, Alberta. Data was collected on 2,280 refugees from a refugee clinic in Calgary and matched with 9,120 non-refugees. Both groups were linked to Alberta Health and Wellness administrative data to assess health services utilization over 2 years. After adjusting for age, sex and medical conditions, refugees utilized general practitioners, emergency departments and hospitals more than non-refugees. A similar proportion in the two groups had seen a general practitioner within 1 week prior to their emergency department visit; however, refugees were more likely to have been triaged for urgent conditions and female refugees seen for pregnancy-related conditions than non-refugees. Refugees were more likely to have had infectious and parasitic diseases. Refugees utilized health services more than non-refugees with no evidence of underutilization.

Keywords Refugees · Access to health care · Emergency department services · Outpatient physician services · Hospital services

Introduction

In maintaining its humanitarian tradition, Canada plays a significant role in protecting refugees through the in-Canada asylum system and resettlement of refugees selected abroad. In 2008 alone, Canada resettled almost 11,000 refugees from overseas and granted permanent residency to another 7,000 protected persons in Canada, placing it among the top five countries resettling refugees and accepting asylum seekers worldwide [1, 2].

Evidence indicates that health disparities exist between refugees and the general Canadian population. The forced nature of their relocation and hostile pre-migration experiences leave many at risk of mental health problems, malnutrition, poor dental health, and communicable and infectious diseases infrequently encountered in non-refugees [3–6]. Through the process of settling refugees commonly face unemployment, economic hardship and social isolation. These complex social factors often result in the manifestation of mental and physical health issues [7, 8]. Refugees also experience cultural, language, educational and geographic barriers which may interfere with their ability to access the health care system or result in the inappropriate use of health care services [9, 10]. Taken together, these factors result in refugees being recognized as one of the most vulnerable populations in Canada [11, 12].

Health services utilization by refugees has been researched in the United States, Europe and Australia, however the evidence generated from many studies is limited. First, the definition of “refugee” is variable, with difficulties encountered in accurately identifying refugee status, making the comparison of results across studies challenging. Second, studies have been limited to the refugee population’s health service use, without a comparison to a non-refugee group. Third, healthcare systems vary across countries.

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In Canada, Kliewer and Kazanjian [13] conducted a pilot study that stratified the study population by immigration category (e.g. family class, economic immigrant and refugee) and examined utilization rates of physician and hospital services by recently landed immigrants living in British Columbia and Manitoba over a 1-year period. Generally, refugees utilized physician and hospital services more than other immigration category in both provinces, but still less than other residents in the province. However, this study did not report on the insight of health services utilization because the aim of this study was to determine the feasibility of data linkage and to describe the health status of recently arrived immigrants to inform medical screening processes. Furthermore, this study analyzed data on immigrants who were landed in Canada in 1995 or 1996, which is relatively old data and does not provide us with a current understanding of health services utilization by immigrants and refugees.

Our study included a large group of refugees in Calgary, Alberta, and matched them with the non-refugee population to evaluate and compare their health status and utilization of outpatient physician, emergency department and hospital inpatient services utilizing more recent data over a 2-year period. Building an evidence base in this area is an important first step in determining whether refugees have equitable access to health care. This knowledge will assist with the development of future health services and program planning that support refugee health and wellbeing.

Methods

Study Population

The study included two groups: refugees and a matched group of non-refugees. Eligible refugees were those who satisfied three criteria. They were: (1) patients attending the Calgary Refugee Health Clinic (CRHC) from August, 2002 to March, 2007 (CRHC provides primary care to newly resettled refugees and asylum seekers); (2) individuals with a valid personal health number (PHN); and (3) residents of Alberta as of April 1, 2007. Refugees assisted by the government, privately sponsored or dependents of refugees landed in Canada are considered landed immigrants, have permanent residency in Canada, and are eligible to receive a PHN when they first arrive. Asylum seekers, however, are not eligible for a PHN because they are considered temporary residents and have federal health benefits covering them for a variety of health services. Thus, asylum seekers were excluded from this study. The comparison group was a random sample derived from the Alberta Health and Wellness (AHW) Provincial Healthcare Insurance Registry. Eligible subjects in this group included

residents of Alberta with a valid PHN as of April 1, 2007. Refugees were matched one-to-four to randomly selected individuals from the Registry matching by both age (± 1 year), sex and residence area because of potential variations in health services utilization across these variables. Residence area was defined using the first three digits of their postal code. In the Calgary Health Region (CHR), the average population size according three digit postal codes is 40,000 (determined by combining the Statistics Canada Forward Sortation Area Postal Code boundary file and the Dissemination Area level population counts), with higher population areas being in the urban centre of Calgary where most refugees are located.

Data Sources

We reviewed patient paper and electronic charts at the CRHC and extracted information on demographic characteristics. Status as a refugee, years in Canada and country of origin were confirmed through immigration documents available in medical charts. Using PHN as a unique identifier, the two study groups were linked through AHW to the Physician Claims database, the Ambulatory Care Classification System (ACCS) database and the Canadian Institute of Health Information's Discharge Abstract Database (DAD). The Physician Claims database records physician services provided including physician specialty, procedures and diagnostic codes. The ACCS captures demographic and clinical information on patients attending outpatient surgery and the emergency department, including diagnostic codes (up to 10), procedure codes, triage level, date of visit, and the destination after their visit. The DAD contains hospital inpatient information including diagnostic codes (up to 25). Both the ACCS and the DAD are coded by health record coders in Alberta.

Study Variables

Outcome variables were outpatient physician (general practitioner), emergency department or hospital inpatient visits over a 2-year study period—April 1st, 2007 to March 31st, 2009. We also examined general practitioner use before an emergency department visit. For this analysis the first visit to the emergency department was extracted for all emergency department users, and general practitioner visits in the 30 days prior to the emergency department visit were determined.

Independent variables included age, sex and refugee status. Country of origin and length stay in Canada were collected for refugees. Country of origin was defined as the country of birth indicated on their immigration documents, and grouped according to the 2001 Census report's geographical world regions.

Other independent variables included triage level, medical condition and reason for visit among health services users. We used the Canadian Triage and Acuity Scale (CTAS) variable in the ACCS database to determine the acuity level of emergency department visits. The CTAS is a valid and reliable tool which assigns a treatment priority to patients [14]. The CTAS has 5 levels; levels 1 and 2 indicate acute cases, level 3 requires evaluation by a physician within 30 min, while levels 4 and 5 signify less urgent or non-urgent cases. The presence of 12 medical conditions was identified using the diagnoses recorded in the Physician Claims database, ACCS database and DAD for a 3-year period prior to April 1, 2007. They were derived from the Charlson Co-morbidity Index [15] and Elixhauser Co-morbidity Index [16] using the enhanced International Classification of Disease (ICD-9-CM and ICD-10) coding scheme developed by Quan et al. [17] (see “Appendix” for administrative data definitions). We grouped hepatitis B in infectious and parasitic diseases rather than liver disease, along with AIDS/HIV. The reason for emergency department and hospital visits was defined using the main condition bringing a patient into contact with these services (the “most responsible” diagnosis coding field).

Statistical Analysis

Descriptive statistics were employed to describe the study population characteristics. Chi-square tests were used to determine any statistically significant differences when comparing proportions between the two groups. We examined the relationship between refugee status and health services utilization adjusting for age, sex and the presence of any medical condition. Logistic regression models were used to obtain the adjusted *P* values.

This study was approved by the Child Health Research Office and the Conjoint Health Research Ethics Board of the University of Calgary, Calgary, Alberta, Canada.

Results

Of the 2,766 refugees identified from the CRHC, 486 (18%) were excluded due to an invalid PHN [i.e. they had an out-of-province health care number or did not receive their PHN yet (6% of refugees) or they did not link with the Provincial Population Health Insurance Plan Registry because a data entry error was made with their PHN (12% of refugees)]. The final refugee study population was 2,280. Through the 4:1 matching process 9,120 individuals were identified to represent the non-refugee group (Fig. 1).

Refugees were young (Table 1), with 54% between 20 and 49 years of age. The largest proportion of refugees was

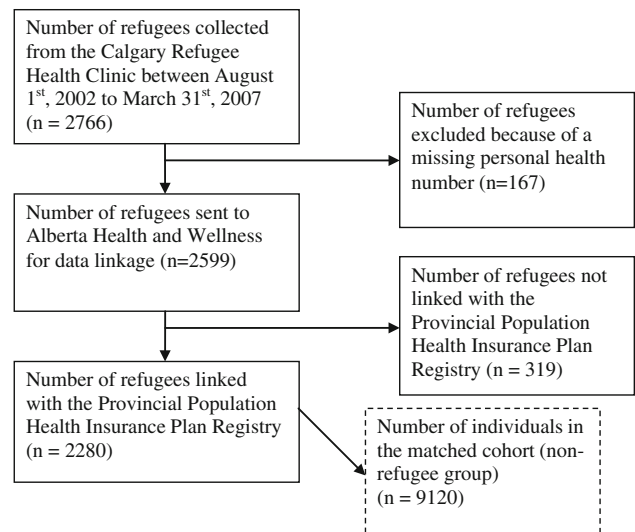


Fig. 1 Derivation of the study groups

Table 1 Demographic characteristics of refugees (N = 2,280)

Variable	n	%
Age group (years)		
<10	463	20
10–19	464	20
20–49	1,227	54
50+	126	6
Sex		
Male	1,239	54
Female	1,041	46
Years in Canada		
≤1 year	547	24
>1–2 years	467	21
>2–3 years	402	18
>3 years	739	32
Unknown	125	5
Country of origin		
Africa	1,101	48
South and Central Asia	460	20
Latin America	376	17
Other	249	11
Unknown	94	4

from Africa (48%) and had lived in Canada for less than 3 years (63%).

The proportion of refugees with at least one medical condition (21%) was lower than the proportion for non-refugees (27%, *P* < 0.001) (Table 2). However, compared with non-refugees, refugees had a higher prevalence of peptic ulcer disease (1.7% vs. 0.7%, *P* < 0.001) and infectious and parasitic diseases (6.6% vs. 1.8%, *P* < 0.001); and a lower prevalence of chronic obstructive pulmonary

Table 2 Prevalence of medical conditions among refugees and non-refugees as of March 31st, 2007

Condition	Refugee (N = 2,280)		Non-refugee (N = 9,120)		P value
	n	%	n	%	
At least one of the following conditions	472	21	2,460	27	<0.001
Congestive heart failure	5	0.3	18	0.2	0.648
Chronic obstructive pulmonary disease	96	5.2	1,087	13.0	<0.001
Connective tissue/rheumatic disease	5	0.3	31	0.4	0.513
Peptic ulcer disease	31	1.7	55	0.7	<0.001
Liver disease	10	0.5	37	0.4	0.568
Diabetes	33	1.8	203	2.4	0.098
Cancer	21	1.1	80	1.0	0.477
Hypertension	78	4.2	454	5.4	0.035
Infectious and parasitic diseases*	121	6.6	151	1.8	<0.001
Depression	160	8.7	821	9.8	0.129
Psychoses	10	0.5	54	0.7	0.608
Drug abuse	7	0.4	106	1.3	0.001

* Infectious and parasitic diseases include: bilharzia (schistosomiasis), giardia, amebiasis, hookworm, ascaris, trichuris, taenia species, malaria, post-primary tuberculosis, filarial and fungal infections, hepatitis B and AIDS/HIV

disease (5.2 vs. 13.0, $P < 0.001$), hypertension (4.2 vs. 5.4, $P = 0.035$) and drug abuse (0.4 vs. 1.3, $P = 0.001$).

Compared to non-refugees, refugees utilized health services more frequently over a 2-year period. This included general practitioners (89% vs. 84%, risk adjusted $P < 0.001$) (Table 3), the emergency department (29% vs. 27%, risk adjusted $P = 0.003$) (Table 4) and hospitals (12% vs. 8%, risk adjusted $P < 0.001$) (Table 5). These patterns were consistent across sex and age groups. Specifically, female refugees and refugees 20–49 years of age utilized the emergency department and hospitals far more than non-refugees. Among general practitioner users, 57%

of refugees and 49% of non-refugees visited 6 or more times (Table 3). Among emergency department users the refugee group had a higher proportion of visits triaged in the top three urgent categories of the acuity scale (CTAS 1, 2 and 3) (58% vs. 53%) compared to the non-refugee group (Table 6). After adjusting for age, sex and any medical condition, there was no significant difference in the proportion contacting a general practitioner within 1 week of an emergency department visit between the two groups (Table 7).

The five most common reasons for emergency department and hospital visits among refugees compared to

Table 3 Outpatient general practitioner visits over 2 years (April 1st, 2007 to March 31st, 2009)

	At least one visit				Adjusted P value*	Among users											
	Refugee		Non-refugee			1–2 visits		3–5 visits		≥6 visits							
	n	%	n	%		n	%	n	%	n	%	n	%				
Overall	2,028	89	7,668	84	<0.001	396	19	1,891	25	485	24	2,025	26	1,147	57	3,752	49
Sex																	
Male	1,063	86	3,916	79	<0.001	266	25	1,240	32	294	28	1,226	31	503	47	1,450	37
Female	965	93	3,752	90	0.004	130	13	651	18	191	20	799	21	644	67	2,302	61
Age group (years)																	
<10	421	91	1,536	83	<0.001	119	28	478	31	141	34	506	33	161	38	552	36
10–19	368	79	1,534	83	0.185	117	32	506	33	116	31	494	32	135	37	534	35
20–49	1,123	92	4,137	84	<0.001	148	13	860	21	217	19	928	22	758	68	2,349	57
50+	116	92	461	91	0.720	12	10	47	10	11	10	97	21	93	80	317	69

* Adjusted for age (categorical), sex and medical condition (any one of the following: congestive heart failure, chronic obstructive pulmonary disease, connective tissue/rheumatic disease, peptic ulcer disease, liver disease, diabetes, cancer, hypertension, infectious and parasitic diseases, depression, psychoses and drug abuse)

Table 4 Emergency department visits over 2 years (April 1st, 2007 to March 31st, 2009)

	At least one visit				Adjusted <i>P</i> value*	Among users							
	Refugee		Non-refugee			1–3 visits				≥4 visits			
	<i>n</i>	%	<i>n</i>	%		Refugee		Non-refugee		Refugee		Non-refugee	
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Overall	669	29	2,454	27	0.003	587	88	2,193	89	82	12	261	11
Sex													
Male	339	27	1,358	27	0.744	301	89	1,227	90	38	11	131	10
Female	330	32	1,096	26	<0.001	286	87	966	88	44	13	130	12
Age group (years)													
<10	125	27	578	31	0.139	115	92	532	92	10	8	46	8
10–19	105	23	483	26	0.207	89	85	442	92	16	15	41	8
20–49	397	32	1,281	26	<0.001	349	88	1,115	87	48	12	166	13
50+	42	33	112	22	0.006	34	81	104	93	8	19	8	7

* Adjusted for age (categorical), sex and medical condition (any one of the following: congestive heart failure, chronic obstructive pulmonary disease, connective tissue/rheumatic disease, peptic ulcer disease, liver disease, diabetes, cancer, hypertension, infectious and parasitic diseases, depression, psychoses and drug abuse)

Table 5 Hospitalizations over 2 years (April 1st, 2007 to March 31st, 2009)

	At least one visit				Adjusted <i>P</i> value*
	Refugee		Non-refugee		
	<i>n</i>	%	<i>n</i>	%	
Overall	282	12	710	8	<0.001
Sex					
Male	66	5	214	4	0.056
Female	216	21	496	12	<0.001
Age group (years)					
<10	8	2	46	2	0.426
10–19	37	8	69	4	<0.001
20–49	217	18	538	11	<0.001
50+	20	16	57	11	0.120

* Adjusted for age (categorical), sex and medical condition (any one of the following: congestive heart failure, chronic obstructive pulmonary disease, connective tissue/rheumatic disease, peptic ulcer disease, liver disease, diabetes, cancer, hypertension, infectious and parasitic diseases, depression, psychoses and drug abuse)

non-refugees are presented in Table 8. The most predominant difference for both visit types was the percentage attending for pregnancy, childbirth and postpartum related conditions (emergency department visits: 6% for refugees vs. 3% for non-refugees; and hospitalizations: 59% for refugees vs. 42% for non-refugees).

Further analysis was done to examine health services utilization by refugees according to country of origin and length of stay in Canada. There were no major variations across either of these variables (Table 9). Out of all countries of origin, South and Central Asian countries had

a higher percentage of persons with general practitioner visits and refugees from African countries had a higher percentage of persons with emergency department and hospital visits. Refugees in Canada 2 years or less had a lower percentage of visits to the emergency department.

Discussion

In this study we compared utilization of health services between refugees and non-refugees in Calgary, and highlighted several points. First, the refugee population was young and had a lower proportion of at least one medical condition compared to the non-refugee population. However, refugees had a notably higher proportion of infectious and parasitic diseases. Second, after adjustment for age, sex and health status, more refugees used general practitioners, the emergency department and hospital inpatient services compared to non-refugees. Third, refugees were equally as likely as non-refugees to have seen a general practitioner within 1 week prior to their emergency department visit, but were more likely to have been triaged in the emergency department for urgent conditions and seen for pregnancy, childbirth and postpartum related conditions. In particular, female refugees and refugees 20–49 years of age used the emergency department more frequently than non-refugees. Lastly, there were no significant variations in health services utilization by refugees according to country of origin and length of stay in Canada.

Our study suggests that refugees utilized health services more frequently than the general population although appropriateness of utilization is unknown. This conclusion

Table 6 Acuity level of emergency department visits over 2 years (April 1st, 2007 to March 31st, 2009)

Triage level	Refugee (<i>n</i> = 1,358 visits)		Non-refugee (<i>n</i> = 4,713 visits)	
	<i>n</i>	%	<i>n</i>	%
Most acute overall (levels 1 and 2)	203	14	638	13
Observation by a physician within 30 min overall (level 3)	586	43	1,859	40
Less urgent overall (levels 4 and 5)	552	41	2,059	44
Triage level missing	17	1	157	3

Table 7 General practitioner use before emergency department visit over 2 years (April 1st, 2007 to March 31st, 2009) (refugees: *N* = 669; non-refugees: *N* = 2,454)

	Within 7 days				Adjusted <i>P</i> value*	Within 8–30 days				Adjusted <i>P</i> value*
	Refugee		Non-refugee			Refugee		Non-refugee		
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
Overall	183	27	616	25	0.292	120	18	344	14	0.020
Sex										
Male	76	22	293	22	0.614	52	15	145	11	0.013
Female	107	32	323	29	0.396	68	21	199	18	0.376
Age group (years)										
<10	30	24	125	22	0.465	12	10	81	14	0.200
10–19	23	22	103	21	0.779	12	11	48	10	0.659
20–49	117	29	344	27	0.291	84	21	192	15	0.002
50+	13	31	44	39	0.330	12	29	23	21	0.280

* Adjusted for age (categorical), sex and medical conditions (any one of the following: congestive heart failure, chronic obstructive pulmonary disease, connective tissue/rheumatic disease, peptic ulcer disease, liver disease, diabetes, cancer, hypertension, infectious and parasitic diseases, depression, psychoses and drug abuse)

Table 8 Reason for visits among users over 2 years (April 1st, 2007 to March 31st, 2009)

Type of visit	Top five reasons for refugee group	Refugee		Non-refugee	
		<i>N</i> = 1,358 visits	%	<i>N</i> = 4,713 visits	%
Emergency department	1. Injury, poisoning and certain other consequences of external causes	362	27	1,397	30
	2. Diseases of the digestive system	102	8	348	7
	3. Diseases of the respiratory system	100	7	421	9
	4. Pregnancy, childbirth and postpartum	75	6	141	3
	5. Mental health and behavioural disorders	62	5	224	5
		<i>N</i> = 331 visits	%	<i>N</i> = 872 visits	%
Hospital	1. Pregnancy, childbirth and postpartum	194	59	362	42
	2. Mental health and behavioural disorders	26	8	76	9
	3. Injury, poisoning and certain other consequences of external causes	25	8	76	9
	4. Diseases of the digestive system	20	6	90	10
	5. Neoplasms	10	3	32	4

Conditions are classified according to the ICD-10 chapters using the primary diagnosis

is contrary to expectations that refugees may have lower health care utilization compared to non-refugees due to barriers accessing health care services [10]. However, these

results are consistent with several studies in Europe and Australia. Correa-Velez et al. [18] examined hospital utilization among people born in refugee-source countries,

Table 9 Refugees with at least one general practitioner, emergency department and hospital inpatient visit over 2 years (April 1st, 2007 to March 31st, 2009) by country of origin and length of stay in Canada

	Health service					
	General practitioner		Emergency department		Hospital inpatient	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Overall	2,028	89	669	29	282	12
Country of origin						
Africa	974	88	347	32	162	15
South and Central Asia	417	91	120	26	53	12
Latin America	332	88	104	28	44	12
Other	220	88	69	28	14	6
Unknown	85	90	29	31	9	10
Length of stay						
0 to ≤1 years	486	89	150	27	70	13
>1–2 years	419	90	127	27	54	12
>2–3 years	351	87	120	30	43	11
>3 years	660	89	227	31	105	14
Unknown	112	90	45	36	10	8

and reported that refugees had higher rates of total hospital and emergency admissions ($P < 0.05$). A study conducted in Denmark demonstrated similar patterns in health services utilization between immigrants and non-immigrants, with higher rates of contact for general practitioners and acute care services among several immigrant groups of refugee origin [19].

Our results are also consistent with studies in Canada comparing health services utilization by recent immigrants or ethnic groups noting similar or higher use compared to the general population [20–29]. Specifically, Quan et al. [20] analyzed health services utilization across ethnic populations in Canada and did not find evidence of disparities in utilization of general physicians between visible minorities and white people, although visible minorities were less likely to have utilized the hospital than white people. Blais and Maiga's [23] study revealed ethnic groups had similar use of most health services and a higher use of specialist services compared to native Quebecers.

Some Canadian studies examining the use of health care services yielded different results compared to our study. In particular, immigrants and other ethnic groups in these studies were less likely to have utilized the hospital [20, 30] and emergency department [26]; however, because these studies did not examine refugees may explain this difference. Additionally, ethnic populations and immigrants utilize preventive care such as cancer screening far less than white and non-immigrants in the United States, Canada, UK and Australia often due to lack of knowledge about screening, understanding of the purpose of the test or benefits of the test in early detection [31–35]. Our study did not examine utilization of preventative care services.

The higher utilization of health services we reported among refugees compared to non-refugees may be related to many factors. Firstly, Canada's universal health care system may be an important factor. The system provides an equal opportunity for its citizens to access health care services regardless of ethnicity or immigration status, as there are no direct costs associated with receiving medically necessary care. Refugees are eligible to receive public health insurance coverage upon arrival in Alberta. Therefore, the financial barriers to use health services do not exist.

Secondly, the availability of services targeting refugee health in Calgary, Alberta may also be influencing utilization of health services. The CRHC was established in 2002 and facilitates access to specialized, transitional primary care and community supports for refugees. Medical staff at the CRHC are trained in immigrant medicine and cultural competency, provide initial health assessments, immunization, preventative screening and health teaching, as well as assist refugees in accessing health services by linking with interpretation services and being geographically located where settlement services are provided (Pim C. Former Program Director, Calgary Refugee Health Clinic, personal Communication: May, 2008). Other provinces in Canada, such as British Columbia, Manitoba and Ontario, are developing or already have established primary health care clinics for refugees, in the attempt to meet the health needs of the refugee population (Pim C. Former Program Director, Calgary Refugee Health Clinic, personal Communication: May, 2008). Not having specialized services to improve access for recent immigrants may have accounted for the lower utilization rates

compared to other residents in Canada documented in other studies [20, 26, 30, 36].

Lastly, the availability of Interpretation and Translation Services in the CHR may also impact use of health service by refugees. Interpretation and Translation Services provides both in-person and over the phone interpretation, along with translated health information, to meet the language communication needs of culturally and linguistically diverse patients accessing CHR programs and services (Pim C. Former Program Director, Calgary Refugee Health Clinic, personal Communication: May, 2008). Language interpretation services, bilingual staff and translated health education materials in the health care system are the most commonly cited barriers to accessing the healthcare system by immigrants and refugees [9, 10, 37, 38]. Difficulties communicating due to limited language proficiency are a struggle at every phase of accessing and navigating the health system. This may limit access to care altogether or result in inappropriate use of services such as repeated visits due to fear of not being understood [39].

Despite the fact that refugees used general practitioners, the emergency department and hospital services more overall compared to non-refugees, it is important to note that refugees may still have problems of access. Services and information may not be sensitive to the cultural and language needs of refugees. Refugees can experience racial discrimination by health care providers creating additional barriers after engaging with the health system. These barriers may compromise the quality of care refugees receive; thus, not meeting their health care needs. Access to health care is complex and more than just simply using a service. It is a multifaceted interaction between characteristics of the health care delivery system and the population at risk, along with other external factors. Equal access to health services does not necessarily mean refugees receive equal quality of care or their care requirements are met [40]. This study could not examine all of the factors associated with access. Equal access was determined by the refugee population overall, however barriers at the individual level may have occurred.

We found that refugees were more likely to use the emergency department and saw a general practitioner within 1 week prior to their emergency department visit to the same degree as non-refugees. This is consistent with research in Denmark showing higher rates of contact with acute care services for the immigrant groups from countries consisting of mainly refugees [19, 41], however contrary to evidence suggesting that they inappropriately use the emergency department for non-urgent issues [42]. We found that refugees were presenting to the emergency department more for urgent conditions compared to non-refugees, showing a high level of need. Female refugees utilized the emergency department two times more than

non-refugees for pregnancy related issues. They may simply be having more children, attending the emergency department for more frequent pregnancy-related complications such as hypertension or miscarriages, or they may be delaying or unfamiliar with routine prenatal care and treatment and be attending the emergency department as a substitute for services that could be provided by a general practitioner or for conditions which could have been prevented through regular prenatal care.

No significant variations existed in health services use by country of origin or length of stay in Canada, despite empirical evidence suggesting there may be differences in health services utilization due to personal experiences with the health care system in their country of origin and at various stages of integration into Canada. Nevertheless, our results are consistent with several studies in Canada and internationally examining health services use by immigrants or refugees reporting no differences across country of origin [24, 25, 42–44] and length of time in the host country [25, 27, 43]. It is possible that health services utilization is influenced more by recent migration experiences or refugee status than by country of origin or length of stay.

Limitations

Our study has limitations. First, the refugee group was collected from patients registered with the CRHC, so the results are subject to selection bias. We were unable to distinguish between refugees who used health services provided by the CRHC versus those that did not, and whether this would have led to differences in health services utilization. As a result, we may have overestimated the use of health services by refugees overall, and particularly for outpatient physician services. Regardless of the source of the services though we were able to document use of physician services, and compare that to a non-refugee population. Furthermore, we captured a large proportion (60%) (Pim C. Former Program Director, Calgary Refugee Health Clinic, personal Communication: May, 2008) of the refugees that had recently arrived over the data collection period from August, 2002 to March, 2007. Although we have missed refugees who had been here prior to the data collection period and therefore recruited a fraction of the refugee population (far less than 60%), it is less likely that we over-estimated utilization of health services. As our results indicate, there is less variation in health services utilization across categories of length of stay in Canada in our sample. Second, the non-refugee group was selected from the Provincial Health Care Insurance Registry whether or not they accessed health services, making this group less likely to have used health care services compared to the refugee group which was selected from the CRHC. However, this was a 2-year follow-up study and the universal health care

system in Canada provides equal opportunity to access the health care system for all of its citizens. The non-refugee group had a similar opportunity to access the health care system. Quan et al. [20] also found that general practitioner use over a 12-month period was similar between visible minorities and white people. Although it is unknown whether the refugee population is different from other ethnic populations in health services utilization, a 2-year period allowed time for both groups to access health care services.

Third, refugees without a PHN were excluded from this study. Although differences may exist between refugees with and without a PHN, refugees without a PHN at the time of arrival are eligible to access the health care system without paying, similar to their counterparts with a PHN. Fourth, although a number of demographic and clinical variables were gathered, other potentially important confounders such as education level, language spoken at home, language proficiency, marital status, and income, were not collected. Fifth, we defined a limited number of chronic, parasitic and infectious diseases through observing diagnoses in the 3 years prior to health services utilization follow-up. Our method may have missed some conditions present at the time of follow-up, and conditions which were not included in our list of medical conditions. An unhealthy individual with the presence of a medical condition may have been assigned as healthy. However, the method we used is less likely to bias our conclusion because we used the same method for both the refugee and non-refugee comparison group. Sixth, we were unable to capture preventative care (for example, screening tests and oral health) or mental health service use, despite evidence suggesting that newcomers are less likely to access preventative care services and that the mental health needs of refugees is high [5, 20, 40, 45, 46]. Seventh, appropriateness of health services utilization was not assessed. Finally, this study was restricted to refugees residing in Calgary, Alberta, which limits the generalizability of these results.

Conclusion

In conclusion, we found that refugees utilized health services more than the non-refugee population, and that there was no evidence of disparities between refugees and non-refugees in their contact with general practitioners, the emergency department or hospitals. This may be due to Canada’s universal healthcare system, the establishment of primary care clinics targeting refugees and access to language interpretation services. Our findings offer support for the development of community-based intervention programs providing knowledge about navigating and appropriately using the health care system; and support primary care clinics aiming to address the unique needs of new refugees, particularly in infectious and parasitic disease screening and treatment. Future studies are needed to examine whether refugees are using services appropriately and the impact of health service use on health outcomes. Examining the reason female refugees are visiting the emergency department more for pregnancy related concerns also needs to be explored further; specifically, whether or not they are substituting these visits with services that could be provided by a general practitioner.

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Appendix

See Table 10.

Table 10 ICD-9-CM and ICD-10 codes used to derive conditions for refugees and non-refugees

Condition	ICD-9-CM diagnostic codes	ICD-10 diagnostic codes
Congestive heart failure	425.4, 425.5, 425.7, 425.8, 425.9, 428	I09.9, I11.0, I13.0, I13.2, I25.5, I42.0, I42.5–42.9, I43.x, I50.x, P29.0
Chronic obstructive pulmonary disease	416.8, 416.9, 490.x–496.x, 500.x–505.x, 506.4, 508.1, 508.8	J40.x–J47.x, J60.x–J67.x, I27.8, I27.9, J68.4, J70.1, J70.3
Connective tissue-rheumatic disease	446.5, 710.0–710.4, 714.0–714.2, 714.8, 725	M05.x, M06.x, M31.5, M32.x–M34.x, M35.1, M35.3, M36.0
Peptic ulcer disease	531.x–534.x	K25.x–K28.x
Liver disease	070.4–070.6, 070.9, 570.x, 571.x, 573.3, 573.4, 573.8, 573.9, V42.7, 456.0–456.2, 572.2–572.8	K70.0–K70.4, K70.9, K71.3–K71.5, K71.7, K73.x, K74.x, K76.0, K76.2–K76.4, K76.8, K76.9, Z94.4 I85.0, I85.9, I86.4, I98.2, K70.4, K71.1, K72.1, K72.9, K76.5–K76.7

Table 10 continued

Condition	ICD-9-CM diagnostic codes	ICD-10 diagnostic codes
Diabetes	250–250.3, 250.8, 250.9, 250.4–250.7	E10.0, E10.1, E10.6, E10.8, E10.9, E11.0, E11.1, E11.6, E11.8, E11.9, E12.0, E12.1, E12.6, E12.8, E12.9, E13.0, E13.1, E13.6, E13.8, E13.9, E14.0, E14.1, E14.6, E14.8, E14.9, E10.2–E10.5, E10.7, E11.2–E11.5, E11.7, E12.2–E12.5, E12.7, E13.2–E13.5, E13.7, E14.2–E14.5, E14.7
Cancer	140.x–165.x, 170.x–172.x, 174.x–176.x, 179.x–195.x, 200.x–208.x, 238.6, 196.x–199.x	C10.x–C26.x, C30.x–C34.x, C37.x–C41.x, C43.x, C45.x–C58.x, C60.x–C76.x, C81.x–C85.x, C88.x, C90.x–C97.x
Hypertension	401.x, 402.x–405.x	I10.x, I11–I13.x, I15.x
Infectious and parasitic diseases	006.x, 007.1, 011.9, 042–044, 070.2, 070.3, 084.x, 110.0–110.5, 111.9, 117.8, 117.9, 118, 120.x, 122.9, 123.0–123.3, 123.6, 125.x, 126.x, 127.0, 127.3, 647.4, 771.2 V02.9	A06.x, A07.1, A16.7, B18.0 B18.1, B20.x–B22.x, B24.x, B35.x, B36.x, B49.x, B50.x–B54.x, B65.x, B68.x, B74.x, B76.x, B77.x, B79.x
Depression	296.2, 296.3, 296.5, 300.4, 309.x, 311.x	F20.4, F31.3–F31.5, F32.x, F33.x, F34.1, F41.2, F43.2
Psychoses	293.8, 295.x, 296.04, 296.14, 296.44, 296.54, 297.x, 298.x	F20.x, F22.x–F25.x, F28.x, F29.x, F30.2, F31.2, F31.5
Drug abuse	292.x, 304.x, 305.2–205.9, V65.42	F11.x–F16.x, F18.x, F19.x, Z71.5, Z72.2

Infectious and parasitic diseases = bilharzia (schistosomiasis), giardia, amebiasis, hookworm, ascariis, trichuris, taenia species, malaria, post-primary tuberculosis, filarial and fungal infections, hepatitis B and AIDS/HIV

A condition was considered present if at least one diagnostic code for the condition existed in any of the diagnostic fields in any of the administrative databases over the 3-year period

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