Neighbourhood Recent Immigration and Hospitalization in Toronto, Canada

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ABSTRACT

Recent immigrants to Canada tend to initially settle in low-income urban core areas. The relationships among immigration, neighbourhood effects and health are poorly understood. This study explored the risk of hospitalization in high recent-immigration areas in Toronto compared to other Toronto neighbourhoods. The study used 1996 hospitalization and census data. Regression was used to examine the effects of recent immigration on neighbourhood hospitalization rates. Most hospitalization categories showed significantly higher rates of admission as the proportion of recent immigrants increased. Income was also significantly associated with all categories of hospitalization except surgical admissions. Average household income was almost 60% lower (\$36,122) in the highest versus the lowest immigration areas (\$82,641) suggesting that, at the neighbourhood level, the effects of immigration and income may be difficult to disentangle. These findings have important implications for health care planning, delivery, and policy.

Half of all new immigrants to Canada, i.e., approximately 100,000-125,000 annually, settle in or near Toronto, Ontario.^{1,2} One in eight of Toronto's residents are recent immigrants, having arrived in Canada in the last five years. Recent immigrants can face unique hardships associated with emigration, adjustment, and integration into society. Socio-economic factors likely play a major role, but other aspects of migration may have an impact on newcomers' health and create special needs for health services as well as barriers to accessing health care. The impact that immigration has on health and the use of health services by both individuals and areas experiencing high levels of recent immigration is not fully understood.

Canadian studies have shown varying results regarding the health services utilization of recent immigrants. Depending on the type of service used, circumstances of migration, country of origin, sex and socio-economic status, studies have shown both similar utilization as well as lower utilization by recent immigrants as compared to Canadian-born populations.³⁻¹³ Most earlier studies, however, did not satisfactorily differentiate between recent and non-recent immigrants, and thus may not have captured the immediate health effects of recent immigration and resettlement. As well, many previous studies used self-reported use of the health care system, which often makes use of proxy respondents.^{9,10} Only one study, conducted in British Columbia and Manitoba, looked at hospital utilization among recent immigrants.¹¹ This study found that in general, hospitalization rates for both sexes were significantly lower than for the Canadian-born population. Hospitalization data are able to give an objective measure of health care use that is independent of self-report.

Despite evidence that immigrants to Canada may experience a "healthy immigrant effect", there have been few studies looking at the area-level health characteristics of high-immigration neighbourhoods. Increasingly, studies have shown that the "contextual" neighbourhood effects of poverty may influence the health and health behaviours of individuals.¹⁴⁻¹⁸ Some studies, particularly in the US, have looked at neighbourhood effects by race.^{14,19} Little attention has been paid, however, to the contextual effects of immigration on neighbourhood health and health behaviours.

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Figure 1. Neighbourhood-level recent immigration by quintile, 1996 Canadian census

One American study found that women living in areas with a high proportion of recent immigrants were less likely to have had clinical breast exams and Pap smears.²⁰

The purpose of this study is to examine the use of hospital inpatient services in high recent-immigration areas in Toronto, to more fully understand the health care needs of these areas. The results are interpreted in the context of the sociodemographic characteristics of those neighbourhoods that may most influence health and health care utilization.

AREA OF RESEARCH

Setting

The geographic area covered by this study consists of the central southern portion of

the amalgamated city of Toronto, Ontario, including the city's downtown core. In 1996, the study area had a population of just under 800,000.

Descriptive analysis

To conduct descriptive analyses on geographic areas relevant to community agencies and hospitals, we adopted the neighbourhoods defined by the City of Toronto Public Health Department.²¹ Canada Census data for 1996 at the census tract level were aggregated into a total of 62 neighbourhoods which were then grouped into quintiles according to the proportion of recent immigrants in their population, with quintile five representing the highest percent of recent immigrants. These neighbourhoods, along with their respective

quintiles, were mapped. Recent immigrants were defined as having immigrated between 1991 and 1996. Neighbourhood quintiles were compared by socio-economic status, immigration, and other factors.

To assess whether the incomes of recent immigrants reflected the incomes of the rest of the neighbourhood, we generated the percent difference in average total income earned by recent immigrants compared to other residents in the same neighbourhood. This information on income disparity was obtained from Statistics Canada custom cross-tabulations.

Multivariate analyses

Hospitalization for major medical conditions based on discharge abstracts from the Canadian Institute for Health Information

TABLE I

Characteristics of Neighbourhoods by Recent Immigration Quintiles*, Inner City Toronto, Ontario

Variables	Recent Immigration Quintiles					Total Study Area
	1†	2	3	4	5	
Mean age (years)	39.7	37.4	36.6	35.6	35.7	36.9
Mean household income (Cdn\$)	82,641	56,308	45,523	40,182	36,122	52,004
Recent immigrants (%)	3.6	7.2	10.7	13.2	20.4	11.2
Total immigrants (%)	28.2	37.7	46.9	51.2	53.3	43.8
Recent immigrants/total immigrants (%)	12.8	19.2	22.9	25.8	38.3	25.7
No knowledge of English or French (%)	1.8	5.6	10.2	11.2	7.6	7.4
Home language not usually English (%)‡	11.0	22.0	34.0	37.5	36.7	28.7
Visible minority population (%)	11.4	22.8	27.2	36.2	49.9	29.9
Unemployment (%)	5.8	9.1	11.0	12.6	13.1	10.3
Population without high school education (%)	19.8	26.7	36.7	43.7	31.7	31.9
Rental housing (%)	44.1	58.5	58.5	57.0	82.7	60.7
Male:female ratio	0.9	0.9	1.0	1.0	0.9	0.9
% difference in average income between recent immigrants and others	-36.2	-44.3	-37.4	-33.1	-36.6	-37.5

* Quintile 5 is highest % of recent immigration and quintile 1 is lowest %.

† One neighbourhood in this quintile had no recent immigrants and therefore was excluded from the disparity analysis.

‡ Single and multiple responses were used for this calculation.

TABLE II

Risk Ratios for Hospitalization by Recent Immigration Quintile*, Age- and Sex-adjusted

Recent Immigrant Quintiles	Medical		Surgical		Obstetrical‡		ACS¶	
	F	M	F	M	F	F	F	M
Quintile 1 (lowest recent immigration)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Quintile 2	1.11	1.14	1.03	1.10	1.02	1.22	1.21	
Quintile 3	1.10	1.20	1.00	1.09	1.08	1.25	1.26	
Quintile 4	1.19	1.29	1.04	1.10	1.08	1.37	1.50	
Quintile 5 (highest recent immigration)	1.18	1.19	1.02	1.04	1.34	1.54	1.47	

* RR > 1 represents a higher risk than the baseline risk (in this case, Quintile 1), RR < 1 represents a lower risk than baseline.

† Statistically significant ($p < 0.05$) values are in bold.

‡ Obstetrical admissions, excluding normal deliveries.

§ Ambulatory care sensitive.

was the main outcome for the analyses. All residents of the study area with a hospital admission in 1996 anywhere in Ontario were included in the study. Using the most responsible diagnosis at hospital separation and the Medical/Surgical Indicator, hospitalizations were grouped into four main categories: medical, surgical, obstetrical, or ambulatory care sensitive (ACS) conditions. Uncomplicated births were excluded from the obstetrical admissions. ACS conditions include diseases for which it is widely believed that timely access to a usual source of primary care should reduce the need for hospital admission (e.g., pneumonia, diabetes and asthma).²²

Multivariate analyses were based on the enumeration area (EA) of residence, which is the smallest geographical area for which Canada Census socio-economic data are available.²³ Postal codes from the hospitalization data were converted to EAs using the Postal Code Conversion File available from Statistics Canada. Within each EA, the expected number of hospitalizations for males and females during the 1996 fiscal year was derived by applying the population age distribution of each EA to the age-specific rate of hospitalization for the

entire study area. The observed/expected ratio of hospitalizations for each EA was then modelled using Poisson regression, and risk ratios were generated along with 95% confidence intervals (CIs). The baseline level of risk was the one experienced by the lowest recent immigration quintile. Average individual income was modelled separately because it was highly collinear with recent immigration (Pearson correlation coefficient = -0.66).

KEY FINDINGS

Descriptive analysis

The study area included 88,440 recent immigrants. Recent immigrants comprised one fifth of the highest recent-immigration quintile and only 3% of the lowest, reflecting large differences in the neighbourhood distribution of recent immigrants. Figure 1 displays the pattern of recent immigration in Toronto. In general, the neighbourhoods with the highest proportion of recent immigrants had lower incomes, higher proportions of visible minorities, higher proportions of people not speaking English at home, and the largest proportion of immigrants from all periods of

immigration (Table I). The average household income for the highest recent-immigration quintile was almost 60% lower (\$36,122) than the average household income of the lowest immigration quintile (\$82,641). Recent immigrants earned 37.5% less than the rest of the neighbourhood population independent of neighbourhood income level. This difference was not affected by the immigrant/non-immigrant composition of the neighbourhood.

Multivariate analyses

The findings of our regression analysis demonstrate that all of the categories of hospitalization, except for surgical conditions in both sexes, show significantly higher rates of admission for both females and males as the proportion of recent immigrants increases (Table II). Medical hospitalizations in males show a non-linear pattern with a tendency for increased rates in higher quintiles. The highest relative rates of hospital admission are seen for ACS conditions, where the highest quintile of recent immigration has rates of admission approximately 1.5 times (95% CI 1.3-1.8 for females and 1.3-1.7 for males) greater than those of the lowest quintile.

Income was significantly associated with all categories of hospitalization except for surgical admissions. With income already in the model, income disparity was not associated with hospitalization.

DIRECTIONS FOR RESEARCH

Insights for future analyses, health care planning, policy, and delivery

Our findings demonstrate considerably greater hospital use and potentially more serious morbidity in areas with high rates of recent immigration. There are two possible explanations for these findings. One is that recent immigrants have high morbidity as measured by hospitalization, and the other is that the residents of neighbourhoods in which recent immigrants settle have high morbidity. If our results do reflect use by recent immigrants, these findings then contradict the “healthy migrant effect” (i.e., self-selection of migrants who are healthier and younger) supported by previous Canadian research.^{9,10,24} As discussed earlier, however, previous research was mostly limited to self-reported health care and did not focus specifically on recent immigrants. Recent immigrants may face increased morbidity during the stressful years of initial adjustment rather than over the long term. The one previous Canadian study that did focus on hospitalization of recent immigrants in British Columbia and Manitoba, found similar or lower rates of hospitalization in recent immigrants, with the exception of pregnancy-related conditions, nervous system and sensory organ disorders and genitourinary conditions in males.¹¹ This study also found, however, that hospital utilization was highest in Family Class immigrants and refugees. Ontario receives a higher proportion of Family Class immigrants and refugees, than either British Columbia or Manitoba. In 2001, for example, Toronto received over 40,000 persons arriving as Family Class or refugees, whereas Vancouver received approximately 11,000.² Immigrants to Toronto’s inner city may therefore be unique with respect to health status compared with immigrants to suburban areas or other provinces.

If recent immigrants are indeed experiencing higher rates of hospitalization than the general population, there are various

possible explanations. The most obvious may be higher rates of morbidity in this population resulting from circumstances related to migration or their pre-immigration experiences. An alternative to the “higher morbidity” explanation may be differences in physician practice style.²⁵ Providers may feel that recent immigrants are less able to manage their conditions as outpatients and therefore require hospital admission. Another possible explanation, as suggested by our results for ACS conditions, is that residents of high immigration neighbourhoods may not receive timely access to primary care and may not be aware of steps they can take to decrease the progression of an illness episode, thereby avoiding hospitalization. This may be a result of language, culture and socio-economic barriers to the appropriate use of health services.^{7,13,26}

Chen et al. found that immigrant status and length of time in Canada were not associated with unmet need, but that income was a significant predictor.³ In their research, poor immigrants reported double the unmet need than higher-income immigrant households. Socio-economic gradients in hospital utilization may be based on similar explanations, and thus greater morbidity in low-income areas may explain the variation in rates.²⁷ In previous work, we found significant socio-economic gradients in the use of hospital services in Toronto’s inner city. Since many high recent-immigration areas in Toronto’s inner city are also low-income areas,²⁸ it is extremely difficult to disentangle the effects of immigration and income. Our income disparity findings suggest that the relationship may be even more complex given that recent immigrants not only settle in low-income areas, but regardless of where they settle, they earn considerably less than their non-immigrant neighbours. Thus, not only are recent immigrants exposed to neighbourhood poverty, but they also experience greater personal levels of poverty than their neighbours.

With area-level analyses, we cannot determine who is being hospitalized, only that they are more likely to be from a high recent-immigration, low-income area. This brings us to the second possible explanation of our results: that it is not the recent immigrants who have high hospitalization rates, but the other residents of high

recent-immigration areas. Although there is significant support in the Canadian literature for a ‘healthy migrant’ effect, this does not mean that immigrants necessarily settle in healthy neighbourhoods. Our findings support those of other studies showing that socio-economic environment is related to health status and health-related behaviour.¹⁴ Low-income neighbourhoods also often have relatively few community resources and unhealthy physical environments (pollution, crowding and inferior housing).²⁹ Thus, even if recent immigrants are healthier than the residents of the neighbourhoods they move into, they may be exposed to environments that can negatively impact their health. Another implication of our findings is that if a ‘healthy immigrant’ effect is at work in these high immigration neighbourhoods, the non-recent immigrant residents must have very high hospitalization rates in order to offset the relatively low utilization by our healthy immigrants. In that case, area-level analyses would result in underestimates of hospital use by non-recent immigrants. These increased rates could in part be a result of higher rates of negative health behaviours in these neighbourhoods, such as smoking, poor diet, or inactivity. Many studies have shown that immigrant behaviours change over time to resemble the behaviours in their adoptive country.³⁰ If this acculturation theory is true, then there are public health implications if immigrants are being exposed to behaviours that are associated with poorer health.

The causes underlying excess hospitalization in high immigrant areas are complex, multiple, and heavily influenced by area socio-economic status. If immigrants are experiencing excess admissions, then it is likely that increased morbidity and barriers to accessing care are among the contributing factors. If excess area-level rates reflect the hospitalization experience of non-immigrants, then hospitalization and morbidity of those residents is being underestimated, as it is being diluted by healthy immigrants. These findings of greater utilization in high recent-immigration areas have important implications for health care planning, delivery, and policy. Further research is required to disentangle complex individual and area effects on the health of recent immigrants.

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RÉSUMÉ

Les nouveaux arrivants au Canada ont tendance à s'installer dans les noyaux urbains à faible revenu. Les liens entre l'immigration, l'effet du quartier et la santé sont mal compris. La présente étude porte sur le risque d'hospitalisation dans les quartiers de Toronto à forte proportion d'immigrants récents par comparaison avec d'autres quartiers de Toronto. Nous avons utilisé les chiffres sur les hospitalisations et les données du recensement de 1996. Par régression, nous avons examiné l'effet de l'immigration récente sur les taux d'hospitalisation dans les différents quartiers. Dans la plupart des catégories, les taux d'hospitalisation ont considérablement augmenté à mesure que la proportion des nouveaux immigrants s'est accrue. Mais le revenu présentait aussi une corrélation significative avec toutes les catégories d'hospitalisation, à l'exception des chirurgies. Le revenu moyen des ménages était presque de 60 % moins élevé (à 36 122 \$) dans les quartiers à forte densité d'immigrants que dans les quartiers à faible densité d'immigrants (82 641 \$), ce qui permet de supposer qu'à l'échelon des quartiers, il pourrait être difficile de démêler les effets de l'immigration de ceux du revenu. Ces constatations ont d'importantes conséquences pour la planification des soins de santé, leur prestation et l'élaboration des politiques en la matière.