PRIMARY AND PREVENTIVE HEALTH CARE UTILIZATION AMONG IMMIGRANT AND NATIVE-BORN WOMEN IN CANADA

PRIMARY AND PREVENTIVE HEALTH CARE UTILIZATION AMONG IMMIGRANT AND NATIVE-BORN WOMEN IN CANADA

By

Kelly Woltman, B.A. (Hons)

A Thesis

Submitted to the School of Graduate Studies

in Partial Fulfillment of the Requirements for the Degree

Master of Arts

McMaster University

MASTER OF ARTS (2007)
(Health Geography)

McMaster University
Hamilton, Ontario, Canada

TITLE: Primary and Preventive Health Care Utilization among Immigrant and Native-born Women in Canada

AUTHOR: Kelly Woltman, Honours B.A. (McMaster University)

SUPERVISOR: Professor K. Bruce Newbold

NUMBER OF PAGES: 96

ABSTRACT

While the health status of immigrants has been extensively studied, research on immigrants' use of health services has yet to be fully investigated. Recent research suggest that recent immigrants, defined as residing in Canada for less than ten years, typically under use the health care system and are less likely to be screened for cancers and other chronic diseases than their Canadian-born counterparts. Furthermore, recent immigrant women as group may be particularly vulnerable.

Using data from the Canadian Community Health Survey (CCHS) and the Canadian Census, the purpose of this thesis is to establish whether the utilization of health care services differs according to immigrant status, and second to determine the individual and neighbourhood factors associated with utilization among women. Specifically, this thesis focuses on primary health care (contact with a general practitioner) and preventive health care service (cervical cancer screening) utilization among immigrant and native-born women in Canada's three largest census metropolitan areas (CMAs). Multilevel multivariate analyses of the CCHS (individual level data) and Canadian Census census tract profile data (neighbourhood level data) indicate that utilization differs according to immigrant status, in addition to health status, cultural background, and socioeconomic characteristics. Recent immigrant women were less like to have had at least one consultation with a general practitioner in the past twelve, and to have ever been screened for cervical cancer (Pap test). However, neighbourhood concentration of immigrants is positively associated with the use of regular screening.

While the factors influencing use remain complex and multifaceted, this thesis has attempted to focus on a several key factors based on the literature, in addition to teasing out any neighbourhood effects.

PREFACE

This thesis is organized as a compendium of related manuscripts and consists of the following chapters:

Chapter Two:	**Neighbourhood influences on physician utilization among immigrant and native-born women**
Chapter Three:	**Preventive Oncology: Immigrant women's use of cervical cancer screening services**

These chapters have been prepared as journal articles co-authored with Dr. K. Bruce Newbold, my graduate research supervisor. While co-authored, the contents of each chapter were the sole responsibility of the thesis author. This includes establishing research objectives, reviewing literature, conducting data analyses and writing manuscripts. The supervisor's contributions include suggestion of research area, framework and model construction, advice on the interpretation of empirical findings, critical evaluation of the manuscript prior to journal submission and editorial advice.

It is important to note that the *Canadian Journal of Public Health* has accepted Chapter three, in part, for upcoming publication. Chapter two is being prepared for submission to *Health and Place*. Different formatting styles were used in these two chapters in order to satisfy the style requirements set out by each journal. In addition, due to the structure of this thesis, there are minor overlaps between the two papers, such as in the methodology sections and in some aspect of the literature reviews and discussions.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

CHAPTER ONE: Introduction

1.1 Research Context

According to the most recent census in 2001, 18.4% of the Canadian population is foreign-born (Statistics Canada, 2005). This percentage has risen from 16.1% in 1991 and 17.4% in 1996 (Statistics Canada, 2005), making the foreign-born population a rapidly growing segment of Canadian Society (Galarneau and Morissette, 2004). While early waves of immigrants primarily came from European countries, immigrants are increasingly from Asian countries and other non-European sources. Among the 1.8 million immigrants who entered Canada between 1991 and 2001, 58% came from Asia, including the Middle East; 20% from Europe; 11% from the Caribbean, Central and South America; 8% from Africa; and 3% from the United States (Statistics Canada, 2003). Canada's immigrant population is an increasingly diverse segment of Canadian society.

Given that this population represents a sizeable proportion of the Canadian population (Pérez, 2002), the health and health behaviours of Canada's immigrants are particularly important, especially since their health is integral to Canada's human capital (Beiser, 2005). It is in this expectation that immigration can help counter an aging country, coupled with the changing dynamics of Canada's immigrant population (Statistics Canada, 2003), that researchers, scientists and those in the health care sector require information about the health status of this population, about how it evolves over time, and an understanding of their use of health services.

Integral to the Canadian healthcare system is the idea of equal access for all, which has resulted from the removal of user fees and standardization of insurance under the Canada Health Act (1984). However, it has been suggested that health care needs of the foreign-born population are not being met, relative to the Canadian-born (Newbold, 2005a). While the health status of immigrants has been extensively studied (Dunn and Dyck, 2003; Gee et al., 2003; Oxman-Martinez and Loiselle-Leonard, 2000; Pérez, 2002), research on immigrants' use of health services has yet to be fully investigated.

1.1.1 Immigrant health

Researchers from a wide array of disciplines have begun to study the differences between immigrants and native-born populations (Antecol and Bedard, 2004). Subject to length of arrival, a major finding is that the health status of immigrants differs from that of the native-born. Upon arrival, the health status of new immigrants to Canada is generally good and comparable, if not better, to that of the Canadian-born (Fowler, 1998). For example, national data reveal that immigrants, especially recent immigrants, are less likely than the native-born population to have chronic conditions or disabilities (Health Canada, 1999). In terms of health behaviours, Pérez (2002) reports that smoking was less prevalent among immigrants than their Canadian-born counterparts. Immigrants also consumed fruits and vegetables more frequently than their counterparts (Pérez, 2002). However, this health advantage appears to rapidly decline with years spent in their new host country.

Throughout this literature, research characterizes this observable phenomenon as the *healthy immigrant effect* (HIE). Specifically, the HIE maintains that immigrants

(both male and female) are healthier at time of arrival than the Canadian-born population. However, this health status advantage diminishes over time and converges to the health status of the Canadian-born (Ali, 2002; McDermott, and Gravel, 2004; Dunn and Dyck, 2003; Gee, Kobayashi, and Prus, 2003; Hyman, 2004; McDonald and Kennedy, 2004; Newbold and Danforth, 2003; Newbold, 2005b; Pérez, 2002; Wu and Schimmele, 2005). A similar pattern has been documented in other major immigrant receiving countries; for American evidence, see for example, Stephen et al. (1994) and for Australian evidence see Donovan et al. (1992). Gee et al. (2003), indicates that the HIE is strongest among new immigrants, most likely due to self-selection into the immigration process with healthier and younger people more likely to migrate, and health requirements in the Canadian *Immigration Act*, for example, that are likely to disqualify people with serious medical conditions (Ali et al., 2004; Dunn and Dyck, 2000; Hyman, 2004, McDonald and Kennedy, 2004; Newbold and Danforth, 2003, Newbold, 2005b; Oxman-Martinez, Abdool, and Loiselle-Leonard, 2000).

Given the very short time in which the decline in relative health status occurs (Newbold, 2005b), it is unlikely to reflect the uptake of unhealthy lifestyles after arrival (Frisbie et al., 2001). Among recent immigrant, defined as residing in Canada for ten years or less, adjustment to the host society may create its own burdens and impacts upon health-seeking behaviours. Research suggests that it is the poor service uptake that "may lead to a worsening of health status over time owing to the relative under-use of preventive health screening and under-diagnosis and treatment of health problems" (Newbold, 2005b, 1360). In fact, this segment of society may use the health care system

less because they may be encountering barriers to use (Ali et al., 2004). Issues that closely reflect the ethnic or cultural makeup of the immigrant population, including diverse issues such as gender roles, trust of western medicine, education and income, may create differentials in the use of health care, and ultimately health. As a result, immigrants may be a vulnerable population who may not be participating in essential health and screening services. Clearly, there is a need to further explore the ways in which immigrants use the health care system.

1.1.2 Immigrant health-seeking behaviours

While some research suggests that immigrant and non-immigrant populations generally use health services in a similar manner (Laroche, 2000), researchers have more recently considered a more nuanced approach suggesting that immigrants, according to duration of residence, may use health services differently (Leduc and Proulx, 2004; McDonald and Kennedy, 2004; Newbold and Danforth, 2003; Newbold, 2005a; Newbold 2005b). For example, the health care needs of new immigrant arrivals may be unlike that of the Canadian-born population (McDonald and Kennedy, 2004; Newbold and Danforth, 2003). Resettlement experiences have the ability to exert enormous influence on the health and use of health services of immigrants (Beiser, 2005). This transition involves "varying degrees of economic, social, and environmental dislocation, all of which affect the health and well-being of immigrants in the period following migration" (Leclere et al. 1994, 371). In particular, immigrant women may experience increased vulnerablility related to settlement, isolation and attainment of basic needs of the family with limited knowledge of resources in the host country (Vissandjee et al., 2004).

Researchers have found that immigrants' use of health care services evolves from the ad hoc use of walk-in and emergency services to the adoption of regular sources of health care (Leduc and Proulx, 2004). Leduc and Proulx (2004, 23-24) found that recent immigrants rely upon walk-in clinics and emergency rooms more often than non-immigrants because they "tended not to have a family physician or a regular source of health care. Despite general similarities found by Laroche (2000), her study suggests that those born outside of Canada are significantly less likely to consult a general practitioner than are native-born Canadians. DesMeules et al (2004) reported that immigrants in British Columbia generally visited a physician less often than their native-born counterparts, although refugees reported similar physician use relative to the native-born British Columbia population. With the exception of refugees who have unique health needs with the "stress associated with refugee status compounding problems" (Newbold, 2005a, 82), research confirms that recent immigrants have infrequent contact with physicians (Health Canada, 1999). In line with Leduc and Proulx's findings, Newbold (2005) observes that as duration of residence increases, so does use of a general practitioner.

Research has also begun to suggest that immigrants report lower use of preventive screening services, such as mammography, and are less likely to have blood pressure tested compared to the long-term immigrant and native-born Canadian populations (Wu and Schimmele, 2005). Supporting these ideas, Health Canada (2001) reports that immigrants tend to under use cancer screening services compared to the native-born population. Several European and American studies have found that recent immigrants,

and particularly women, receive less preventive services than the mainstream population (see for example, Remennick, 1999). Overall, these findings are important because the use of essential primary care and screening services can reduce health risks and early diagnosis can avoid health care crisis (Wu and Schimmele, 2005). Therefore, the purpose of this thesis is to examine the use of health care in relation to immigrant health behaviours and investigates those potential factors that influence their use.

1.2 Research Objectives

Given that the reduction of inequities in health is an important aspect of population health, which aims to "reduce inequities in the underlying conditions that put some of Canadian's population at a disadvantage for attaining and maintaining optimal health" (Health Canada, 2001; Ng et al., 2004, 1545), the objective of this research is to investigate the utilization of primary and preventive health among immigrant women in Canada. Specifically, this Master's thesis proposes to:

- To investigate evidence of disparities in the use of a general practitioner (primary health care service) care services, between immigrant and native-born women;
- To explore the factors that determines uptake of preventive cervical cancer screening services (Pap testing) among immigrant women, as compared to the native-born population.
- To explore the factors that determine compliance with regular cervical cancer screening services guidelines in Canada (regular Pap testing) among immigrant women, as compared to the native-born population.

1.3 Contributions

This research seeks to clarify our understanding of primary and preventive health behaviours and the challenges immigrant women may face. This research entails a cross-sectional, multilevel study of the neighbourhood and individual characteristics that influence the use of these health care services. Specifically, this thesis seeks to clarify our understanding of the factors associated with the use of general practitioner and cervical cancer screening services, which may have significance for policy makers, public health community and future research for several reasons.

The Canadian Centre for Chronic Disease Prevention and Control (2003) recognizes that there is limited national knowledge on the health service use among immigrant populations in Canada, particularly on the determinants of primary and preventive health care use among women. Immigrant women represent a sizeable proportion of immigrants entering Canada. For example, in 2005, Canada accepted 262, 236 new permanent residents, of which over 51 percent were female (Citizenship and Immigration Canada, 2006).

This research seeks to contribute to the current body of literature regarding immigrant women and their health seeking-behaviours. In terms of gender differences, this research recognizes that research on immigrants' use of health services has yielded inconclusive results. In addition, very few studies examine the use of preventive health care among Canada's immigrant population. This research will also highlight potential importance of the cultural determinants of health seeking behaviours. The effects of

cultual background and immigrant status may have real effects on a woman's ability to participate in the health care system. This research also seeks to unearth the important socioeconomic, community and health-related predictors of use.

The expected results may also highlight policy relevant or mutable variables that may lead to changes in utilization of a general practitioner and cervical cancer screening services. Variables that are mutable or changeable may include language skills and community resources. This may contribute information to aid the design of effective public health policies to increase awareness of both the availability and the importance of annual health check-ups and cancer screening, particularly for groups that might otherwise face barriers to the use of these preventive services.

As suggested by Bryant and her colleagues (2002, 244), "a reduction in cancer mortality and morbidity through preventive screening can only be reached if a significant proportion of the target population accesses screening services on a regular basis". Annual contact with a general practitioner and use preventive services can be important measures leading to healthier aging populations and less pressure on our health care system. Early detection is important because the costs, to the individual and society, of preventive, routine treatment are usually much less than the costs of future ailments and disease that could have been prevented or mitigated (Jang et al., 1998).

This research can be valuable to researchers and policy makers, and may assist in the identification of how programs can be better tailored to meet the needs of this population, or the identification of specific needs of immigrant women. Findings may have implications for public policy, planning and needs-based resource allocation.

Furthermore, this research contributes to the growing body of knowledge surrounding immigrant health. With a particular focus on cultural differences, this research offers a number of insights into a growing area. If the objective of universal screening is to be achieved, it is important that the factors associated with primary care and cervical cancer screening are recognized as a population health issue worthy of investment in research and further developments.

1.4 Chapter Outline

This thesis consists of a total of four chapters. Following this introductory chapter, Chapters 2 and 3 are organized as journal articles and report on the use of primary and preventive health care service utilization among immigrant and native-born women in Canada.

Chapter 2 focuses on investigating the extent to which neighbourhood characteristics influence primary health care use above and beyond individual characteristics. This chapter sets out to achieve four objectives. The intent is to examine the extent to which key variables suggested by a behavioural model of health care utilization explain the primary health care utilization among immigrant and native-born women; investigate the extent to which individual versus neighbourhood effects explain the variation in utilization; consider whether or not there is any evidence of significant neighbourhood-to-neighbourhood variation in the use of primary health care; and if so, whether or not the variation in utilization explained by neighbourhood due to differences

in selected demographic and socio-economic characteristics of individuals living in those neighbourhoods.

Building on primary health care utilization, Chapter 3 focuses on the use of preventive health care services, and specifically on cervical cancer screening among immigrant women. This is a particular preventive service usually provided by a general practitioner or family doctor. The objective is to explore any evidence of between neighbourhood variation in the utilization of cervical cancer screening; examine the role neighbourhood concentration of immigrants plays; explore potential difference between immigrant and native-born women; examine the role of city; and explore evidence of cultural differences. In order to achieve the outlined objectives, Chapters 2 and 3 draw upon two secondary data sources: Cycle 2.1 (2003) of Statistics Canada's Canadian Community Health Survey (CCHS) master file and profile information from the 2001 Canadian census public-use file. Finally, Chapter 4 concludes with a discussion of major findings, research contributions (including policy implications) and future research.

1.5 References

Ali, J. 2002. *Mental Health of Canada's Immigrants*. Supplement to health reports, Statistics Canada, Catalogue 82-003-SIE, pp. 1-11.

Ali, J., McDermott, S., and Gravel, R. 2004. Recent Research on Immigrant from Statistics Canada's Population Surveys. *Canadian Journal of Public Health, May/June, 95*(3), 19-24.

Antecol, H. and Bedard, K. 2004. *Unhealthy assimilation: do immigrants converge to American weights?* Claremont McKenna College, Working Paper Series 2004-06. (Accessed on 15 November 2005, URL: http://opus.zbw-kiel.de/volltexte/2005/2701/pdf/2004-06.pdf)

Beiser, M. 2005. The health of immigrants and refugees in Canada. *Canadian Journal of Public Health,* 96: S30-S44.

Bryant, J., Browne, A.J., Barton, S., Zumbo, B. 2002. Access to health care: social determinants of preventive cancer screening use in north British Columbia. *Social Indicators Research* 60:243-262.

Canadian Centre for Chronic Disease Prevention and Control. 2003. Health Topics: Immigrant Health. (Last Accessed: 20 May 2007, URL: http://www.phac-aspc.gc.ca/ccdpc-cpcmc/topics/immigrant_e.html).

Citizenship and Immigration Canada. 2006. Facts and Figures 2005. Immigration Overview: Permanent Residents. (Last Accessed: 15 June 2007, URL: http://www.cic.gc.ca/english/resources/statistics/facts2005/permanent/02.asp).

DesMeules, M, Gold, J, Kazanjian, A, Manuel, D. et al. 2004. New Approaches Immigrant Health Assessment. *Canadian Journal of Public Health,* 95(3): I22-I26.

Donovan, J., d'Espaignet, E., Metron, C., and van Ommeren, M. eds. 1992 *Immigrants in Australia: A Health Profile.* Australian Institute of Health and Welfare Ethnic Health Series, No 1. Canberra: AGPS.

Dunn, J.R., and Dyck, I. 2000. Social determinants of health in Canada's immigrant population: Results from the National Population Health Survey. *Social Science and Medicine, 51,* 1573-1593.

Fowler, N. 1998. Providing primary health care to immigrants and refugees: the North Hamilton experience. *Canadian Medical Association Journal,* 159(4): 388-391.

Frisbie, W.P., Youngtae, C., and Hummer, R.A. 2001. Immigration and the health of Asian and Pacific Islander adults in the United States. *American Journal of Epidemiology,* 153(4): 372-380.

Galarneau, D., and Morissette, R. 2004. Immigrants: Settling for Less? *Perspectives on Labour and Income*, Statistics Canada. Catalogue 75-001: 5(6) 5-16.

Gee, E., Kobayashi, K., and Prus, S. 2003. *Examining the "Healthy Immigrant Effect" in Later Life: Findings from the Canadian Community Health Survey*. McMaster University, SEDAP Research Paper 98.

Health Canada Act. 1984. C.6, S.1.

Health Canada. 1999. *Canadian Research on Immigration and Health.* Ottawa: Ministry of Health.

Health Canada. 2001. *Certain Circumstances: Issues of Equity and Responsiveness in Access to Health Care in Canada.* Ottawa, Minister of Public Works and Government Services.

Hyman, I. 2001. *Immigration and Health.* Health Canada, Health Policy Working Paper Series, 01-05. Catalogue H13-5/01-5E.

Hyman, I. 2004. Setting the Stage: Reviewing Current Knowledge on the Health of Canadian Immigrants: What is the Evidence and Where are the Gaps? *Canadian Journal of Public Health, 95*(3), 14-19.

Jang, M., Lee, E., and Woo, K. 1998. Income, Language, and Citizenship Status: Factors affecting the health care access and utilization of Chinese Americans. *Health and Social Work,* 23(2): 136-145.

Laroche, M. 2000. Health status and health services utilization of Canada's immigrant and non-immigrant populations. *Canadian Public Policy*, 24(1): 51-75.

Leduc, N. and Proulx. M. 2004. Patterns of health services utilization by recent immigrants. *Journal of Immigrant Health,* 6(1): 15-27.

Leclere, F. and Jensen, L. and Biddlecom, A.1994. Health care utilization, family context, adaptation among immigrants to the United States. *Journal of Health and Social Behaviour,* 35:370-384.

McDonald, J.T., and Kennedy, S. 2004. Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. *Social Science and Medicine, 59,* 1613-1627.

Newbold, K.B. 2005a. Health status and health care of immigrants in Canada: a longitudinal analysis. *Journal of Health Services Research and Policy*, 10(2): 77-83.

Newbold, K.B. 2005b. Self-Rated Health Within the Canadian Immigrant Population: Risk and the Healthy Immigrant Effect. *Social Science and Medicine, 60,*1359-1370.

Newbold, K.B., and Danforth, J. 2003. Health Status and Canada's immigrant population. *Social Science and Medicine, 57,* 1981-1995.

Ng, E., Wilkins, R., Gendron, F., and Berthelot, J.M. 2005. Dynamics of Immigrants' Health in Canada: Evidence from the National Population Health Survey. *Statistics Canada,* Healthy today, healthy tomorrow? Issue 2. Catalogue 82-618.

Oxman-Martinez, J., Abdool S.N., and Loiselle-Leonard M. 2000. Immigration, Women and Health in Canada. *Canadian Journal of Public Health, 91*(5), 394-395.

Pérez, C. E. 2002. Health status and health behaviour among immigrants. *Supplement to health reports,* Statistics Canada, catalogue 82-003-SIE, p. 112.

Remennick, L.I. 1999. Preventive behavior among recent immigrants: Russian-speaking women and cancer screening in Israel. *Social Science and Medicine,* 48:1669-1684.

Statistics Canada. 2003. *Canada's ethnocultural portrait: The changing mosaic.* 2001 Census Analysis Series. (Last Accessed on 5 December 2005, URL: http://www12.statcan.ca/english/census01/products/analytic/companion/etoimm/canada.htm).

Statistics Canada. 2005. *Proportion of Foreign-born Population*, 1991- 2001 Census. (Last Accessed on 2 December 2005, URL: http://www40.statcan.ca/l01/cst01/demo46a.htm).

Stephen, E.H., Foote, K., Hendershot, G.E., and Schoenborn, C.A. 1994. Health of the Foreign-Born Population. *Advance Data from Vital and Health Statistics,* 241: 1-10.

Vissandjee, B., Desmeules, M., Cao, Z., Abdool, S. and Kazanjian, A. 2004. Integrating ethnicity and migration as determinants of Canadan women's health. BMC Women's Health, 4(Supplement 1): S32-S42.

Wu, Z., and Schimmele CM. 2005. *Health care utilization of later-stage immigrants in British Columbia.* Research on Immigration and Integration in the Metropolis, Working Paper Series, No. 05-15. (Accessed: 3 November 2005, URL: http://www.riim.metropolis.net/research-policy/research-policy2/papers_e7.htm)

CHAPTER TWO:

Neighbourhood influences on physician utilization among immigrant and native-born women

2.1 Abstract

Using a multilevel framework, this paper explores primary health care use among native-born and immigrant women in order to investigate the extent to which neighbourhood characteristics influence primary health care utilization above and beyond individual characteristics. This research focuses on women living in Canadian urban centres where, despite universal access to health care free of financial barriers, access remains uneven. Using the 2003 Canadian Community Health Survey and the 2001 Canadian Census, cross-sectional multilevel logistic regression models examine potential neighbourhood variability in the relationship between individual health seeking behaviours and contact with a general practitioner within the past twelve months. Findings suggest that recent immigrant status appears to be negatively associated with the use of a general practitioner's services, even after controlling for age and health status. Self-reported cultural characteristics were also significantly associated with utilization. Women reporting Chinese, Filipino, Japanese and Korean background were less likely to have consulted with a general practitioner in the past twelve months than the white reference group. The inclusion of cultural background also reduced the importance of recent immigrant status to non-significance. While age, health status, education, income adequacy and cultural origin modified the association between utilization, neighbourhood

level variables exerted a significant influence on utilization. Results reveal neighbourhood differences. Neighbourhood disadvantage was negatively associated with use, while the neighbourhood concentration of immigrants was positively associated. Finally, the CMA also appears to play a significant role in use. Overall, there may be a need for better targeting of primary health care services, to vulnerable minority populations, as well as focusing on places in addition to individuals.

Keywords: *health services research; general practitioner; immigrants; cross-sectional studies.*

2.2 Introduction

Increasingly, research questions the role of place in influencing health and the utilization of health care, with evidence suggesting that contextual attributes (i.e., neighbourhood conditions) may influence a variety of health outcomes (Glazier et al., 2004; Law et al., 2005; Litaker et al, 2005; Pickett and Pearl, 2001; Ross et al., 2004, Ross et al., 2005; Veugelers et al., 2004, Yip et al., 2002). Yet, the question of whether this also applies to health-related behaviours, whether by region, district or neighbourhood, has been less often addressed (Macintyre and Ellaway, 2003, 28; Yip et al., 2002). In addition to personal behavioural choice, it is likely that health care use reflects the social and cultural environment, as well as individual socioeconomic and demographic characteristics (McDonald and Kennedy, 2005).

Efforts to understand the factors contributing to the uptake of essential health services observes that immigration-specific issues may be magnified by language, socioeconomic status, cultural factors, and social networks (Laroche, 2000; Leduc and Proulx, 2004; Newbold, 2005a; Newbold, 2005b; Perez, 2002; Wu and Schimmele, 2005). These complex factors may serve to create barriers and potentially impact upon immigrant health status (Newbold, 2005b, 1368). Health care services remain an important determinant of health. Ultimately, poor access and service use may lead to a worsening of health status over time owing to diagnosis and treatment of health problems (Newbold, 2005a). Given that immigrants represent a growing proportion of the

Canadian society, understanding the determinants of immigrant populations' utilization is essential in ensure their health needs are being addressed.

Defined as residing in Canada for less than ten years, recent immigrant arrivals are likely to have infrequent contact with health care professionals and more likely to rely on emergency services (Health Canada, 1999; Leduc and Proulx, 2004).[1] Research suggests that this relative under utilization includes the use of primary and preventive health care services; for example, several studies indicate that recent immigrants are less likely to have a family doctor or to be screened for chronic diseases as compared to their longer-term immigrant and the native-born counterparts (DeMeules et al., 2004; Goel, 1994; Hyman and Guruge, 2002; McDonald and Kennedy, 2005).

Primary health care services, such as the services of a general practitioner, are universally insured services provided to citizens and residents of Canada under the 1984 Canada Health Act. "While medical need is clearly the most important determinant of health care utilization, other non-medical factors may also influence the consumption of health care services" (Wu and Schimmele, 2005, 3). Whether or not this relative "under use" reflects reduced levels of need, unfamiliarity with the system, and/or societal and cultural barriers has not been established (DesMeules et al., 2004). Nevertheless, these factors can create barriers to reasonable access to care within the system (Newbold, Eyles and Birch, 1995). In other words, health behaviours may be more than just health care that is free to the user at the point of delivery (Newbold, 2005).

[1] Based on evidence within the literature (see, for example McDonald and Kennedy, 2004), it is within nine years that immigrant health behaviours start to reflect those of their native-born counterparts.

Drawing upon the determinants of health perspective and utilizing the behavioural model of health care utilization, this research focuses on the utilization of primary health care services among native-born and immigrant women. The objective is to examine the extent to which individual and neighbourhood characteristics influence use of primary health care. That is, what factors are associated with use, and how much of the variability in having consulted with a general practitioner can be attributed to differences between neighbourhoods (if any) and how much to difference between individuals within neighbourhoods?

2.2.1 Literature Review

While there has been an overall increase in research studying patterns and factors for use in the general population, few studies focus explicitly on recent immigrants in Canada, immigrant women, or on the role of place (e.g., neighbourhoods) in determining utilization. Previous research has focused on assessing the impact of individual socioeconomic factors on heath service use. For example, Dunlop et al. (2000) investigated the relationship between socio-economic status (SES) and use of a physician. Although financial barriers did not directly impede use (Birch et al. 1993), Dunlop et al. (2000) reported disparities between individual SES and physician use. It is well documented that women from economic and socially disadvantaged groups are at risk for low participation in the health care system and consequently, at a greater risk for poor health (Bryant et al., 2002). The 'determinants of health' perspective has been valuable in highlighting these important distinctions (also see for example Dunn and Dyck, 2000).

Clearly, there appears to be a complex interaction between use, culture, socio-demographic factors and environments.

Recent Immigrants

Building upon this perspective and drawing upon the broader social science literature, a lack of knowledge about available health care services may result in infrequent and occasional contact with health care professionals. Many newcomers may be unfamiliar with the type of health care offered in their new host country, which can make accessing care challenging (Laroche, 2000). For example, Remennick (1999) reports that the "low awareness of their rights as clients and flawed communication with providers" often affected the health service use among minority groups of women (Remennick, 1999, 1682).

Another important consideration is cultural background, ethnicity or ancestry. According to Laroche (2000), the relative under use of physicians among those born outside of Canada may reflect lack of knowledge due to cultural beliefs. "Immigrants may embody different perceptions of health relative to the mainstream population" (Newbold, 2005b, 1360). Cultural barriers include the distrust of professionals, fear of hospitalization and lack of same ethnic-origin health professionals (Hyman, 2001). In the case of Marshallese immigrants, for example, needles and having blood drawn are new experiences; this unfamiliarity can create fear of western medicine (Williams and Hampton, 2005). It has been speculated that the under use of health care services among non-Western groups, such as among recent immigrant populations, can be explained by traditional beliefs and practices which may act as barriers to health care and utilization of

Western health services (Jenkins et al., 1996). Cultural differences and ancestral beliefs about health and medicine can raise barriers that interfere with the delivery of adequate health services (Laroche, 2000). As recent immigrants increasingly arrive from Asian source countries, cultural barriers may impact health care utilization to a greater extent than previously acknowledged (Health Canada, 2001).

Nevertheless, scholars are unclear about the extent to which cultural backgrounds impact use. For example, Jenkins et al. (1996), in their study examining health care access and use among Vietnamese immigrants in North America, report that their findings do not support the hypothesis that traditional beliefs and practices act as barriers to health care or use of preventive services. However, small sample sizes, such as that used by Jenkins et al. (1996), may not permit generalization. As a result, further research, including nationally representative studies, could be helpful in understanding the role of culture, as many new immigrants may not see medical care in a timely manner.

Other findings point out that individuals who are less proficient in English tend not to receive recommended health care services such as regular health check-ups (Woloshin et al., 1997). For example Fowler (1998, 388-389) suggested that non-English-speaking individuals, including new immigrants, are less likely to receive screening for chronic diseases compared to other long-term immigrant and native-born women in North America. According to Statistics Canada (2003), a growing proportion of Canada's newest immigrants report speaking a language other than English or French most often at home. Jang et al. (1998) reports that not speaking the host country's official language, along with other mediating socioeconomic factors (such a low income), are

associated with not having a regular contact with primary health care. Furthermore, one particular study found that after adjusting for socioeconomic factors and culture, differences across language groups were attributable to a communication barrier (Woloshin et al., 1997). Coupled with growing heterogeneity in source countries of immigrants and increasing ethnic minority populations in Canada, language barriers may be an increasingly important barrier to seeking health care (Woloshin, 1997; Health Canada, 2001).

In her investigation of the influence of downward social mobility and marginalization experienced by immigrants on their use of primary health care services, Remennick (1999) found that this acculturation-related stress might have special ramifications, particularly among recent immigrant women. Resettlement experiences have the ability to exert enormous influence on the health and use of health services of immigrants (Beiser, 2005). The process of migration involves "varying degrees of economic, social, and environmental dislocation, all of which affect the health and well-being of immigrants in the period following migration" (Leclere et al. 1994, 371). Many issues, such as age and gender, may further obscure health and health-related behaviours as immigrants adjust to their host county (Newbold and Danforth, 2003). This may take a particular toll on women. Only a handful of studies have examined the role of immigration on the use of a health service in Canada among immigrant women. Meadows et al. (2001) propose that the process of immigration needs to be recognized as a determinant of health in and of itself. Clearly, new immigrants undergo many changes

in order to establish themselves in a new country, often dealing with acculturation stress and holding vulnerable socio-economic positions upon arrival.

Neighbourhoods and health-related behaviours

With the exception of a few studies (Glazier et al., 2004; Yip et al., 2002), literature examining immigrant's health seeking behaviours has often neglected the role of an individual's surrounding environment. Place matters as an individual moves from one country's health care system to another. However, little is known about the way place affects health care use among immigrants after arrival. At the local level, what role does one's immediate environment play in determining the uptake of health care? Until recently, studies have focused on either individual or aggregate level area characteristics in attempting to provide more nuanced insight. However, new analytical techniques have allowed for a more careful investigation (Snijders and Bosker, 1999). A number of studies using these techniques have focused on health status, revealing that contextual factors such as income inequality and neighbourhood deprivation may affect the health of individuals (Veugelers et al., 2004). Variations in neighbourhoods may also play an influential role in the uptake of health care services. To date, health service use among immigrant women has not been examined under this particular lens.

Recent immigrants may be particularly disadvantaged, as recent arrivals are also more likely to live in disadvantaged neighbourhoods characterized by high concentrations of ethnic minority groups and immigrants (Heisz and McLeod, 2000). Nevertheless, immigrant neighbourhoods may also be supportive; for example, immigrants within these communities can teach one another how to navigate new systems and institutions. Often

by reflecting the availability of resources individuals can draw upon, neighbourhood may shape many of their health seeking behaviours (Litaker et al., 2005).

2.2.2 Theoretical Framework

In order to frame this study of health-related behaviours, the behavioural model of health services utilization is used (Andersen, 1968). Originally developed in the late 1960s to study the determinants of acute care health services use, Andersen's model (1968; Andersen, 1995) has been frequently used to understand the factors that either facilitate or impede health care services utilization among individuals (Eyles, Birch and Newbold, 1995; Law et al., 2005; Wu and Schimmele, 2005). More recently it had been acknowledged that this model recognizes the conceptual relationship between contextual characteristics and entry into the healthcare system (Litaker et al., 2005). This model's proposed determinants of health services use can be grouped into three separate categories, which include factors that predispose an individual towards services use, factors that enable them or impede use, and factors that determine an individual's need for care (Andersen, 1968; Andersen, 1995). In the context of this research, Andersen's behavioural model of health care utilization outlines the different factors that help determine the health care immigrant and native-born women receive and serve as a guide in the selection of significant variables.

Predisposing factors reflect the propensity of certain individuals to use services, which include demographic characteristics (age, marital status). Also included under this category is social structure, which is measured by a broad array of factors (education, occupation, ethnicity, culture) that determine the status of an individual in the

community, ability to cope with presenting problems and commanding resources to deal with these problems, and the state of the physical environment (Andersen, 1995). For example, cultural beliefs that ignore preventive medicine, create isolation from the community at large, and enforce language barriers that may interfere with women's access and utilization of health care (Gupta, 2002). Measures of beliefs or culture include ethnicity, nativity and duration of residence. Revisiting his work in 1995, Andersen revised this original category to include health beliefs. Health beliefs are attitudes, values, and knowledge that individuals have about health and health services (Andersen, 1995).

Enabling factors are characteristics that represent the means by which people use health services (Law *et al.*, 2005). They include both personal and organizational factors that must be present for service utilization in order for an individual to actually use the service. Personal factors include individual and family characteristics, such as household income and the presence of health insurance. Given the presence of universal insurance under the Canada Health Care Act, the Canadian population and its residents are covered. Organizational factors include the health care system, availability of social resources, and (social) attributes of the community in which the individual lives (Aday and Andersen, 1973). Urban-rural distinctions may also be considered under this category, as geography can be seen as an enabling factor (Law et al., 2005).

The third category, *need*, reflects the most immediate determinants of health services utilization. The need component may be either that perceived by the individual (such as health status) or that evaluated by the delivery system (Aday and Andersen, 1974). *Need* is often controlled for using self-reported health status, which has shown to

be the most important determinant of physician use (Fylkesnes, 1993) and supported by other studies (see for example, Dunlop et al., 2000).

This theoretical framework suggests an important explanatory role for factors that reflect cultural identity and demographics, such as ethnicity and potentially immigrant status (McDonald and Kennedy, 2005). This model suggests that use is determined by community (or societal) factors, health services factors and individuals factors. Furthermore, with the goal of investigating the factors associated with health care utilization among a nationally representative population of women, this model is suitable as a guiding theoretical framework for this research. Therefore, the objective of this paper is to investigate the determinants of primary health care utilization at the neighbourhood and individual level and the effects of neighbourhood socio-demographic characteristics on this use. In order to address these objectives, this research asks:

1. To what extent do the selected variables explain primary health care (general practitioner) utilization among immigrant and native-born women?
2. To what extent do individual versus neighbourhood effects explain the variation in utilization?
3. Is there evidence of significant neighbourhood-to-neighbourhood variation in the use of primary health care?
4. If so, is this neighbourhood variation due to differences in selected demographic and socio-economic characteristics of individuals living within neighbourhoods?

2.3 Methods

The data for this research comes from nationally representative Canadian data sets that includes the cross-sectional Canadian Community Health Survey (CCHS) Cycle 2.1 (2003) master file dataset and profile data from the 2001 Canadian Census. The CCHS is a cross-sectional data set collected by Statistics Canada (2005b). The sample was selected using the area frame designed for the Canadian Labour Force Survey. A multi-stage stratified cluster design was used to sample dwellings within this area frame. The target population of the CCHS was randomly selected from the sampled households. Persons aged twelve years and older, residing in all Canadian provinces and territories (excluding populations on Indian Reserves, Canadian military bases, individuals residing in institutions, and residents of certain remote regions of Canada) was selected and interviewed.

With an interest in investigating a sub-population of the Canadian population, the CCHS is particularly useful for the analysis because it samples a larger number of individuals (130,000) than the National Population Health Survey, which samples a panel of 17,000 people (Statistics Canada, 2005). The CCHS is the largest national health survey conducted across Canada.[2] As suggested by Ali *et al.* (2004), this offers expanded possibilities for immigrant research because the large sample size captures enough immigrants to permit more detailed subgroup examinations than previously available. In

[2] Unlike the new Longitudinal Survey of Immigrants to Canada (LSIC), the CCHS asks as wide range of health-related questions, including asking all female respondents about preventive health screening utilization. The LSIC does not collect any information pertaining to preventive health care.

addition, it is important to note that respondents who could not converse in English or French were interviewed in their own language of choice. The CCHS permitted interviews to be conducted in one of twenty-four different languages. This is an advantage of using this dataset, especially given that recent immigrants may not be able to communicate in Canada's official languages or feel comfortable doing so. Therefore, the CCHS is the primary dataset used for this research, with the sample population, outcome variable, and the majority of the explanatory variables obtained from it. Additional explanatory variables are derived from the 2001 Canadian census. This dataset was merged into the CCHS and discussed below. This additional data set will provide valuable contextual information at the neighbourhood level.

Publicly available information from the 2001 Canadian Census data is used to provide area level variables aggregated at the census tract level. This information, known as census tract profile data, has been prepared by Statistics Canada based on the long form of the 2001 census which was given to a 20% sample of all Canadian households (Statistics Canada, 2005). The Census long form included questions on a wide range of demographic, geographic, economic and social characteristics of household members. Similar to Statistics Canada's CCHS, the Canadian Census also relies upon a multistage stratified cluster sampling design. For the purpose of this research, neighbourhoods will be opertationalized according to census tracts. Defining neighbourhood areas based on census tracts is consistent with existing research (Ross et al., 2004), and has proven to be useful since they are small, homogeneous area bounded by natural and permanent boundaries. The average census tract consists of approximately 4,000 individuals

(Statistics Canada, 2002). Any smaller geographic scale, such as dissemination area (that recently replaced enumeration areas), will create potential sample size issues. Together these two datasets were merged together using Statistics Canada's postal code conversion file. Postal codes from CCHS respondents were linked to census dissemination areas (DA) and then linked to 2001 Census data via census tracts to obtain contextual or aggregate level measures for each respondent.

2.3.1 Sample

The study sample was confined to female CCHS respondents' aged 18 years to 69, residing in the Toronto, Vancouver and Montreal Census Metropolitan Areas (CMAs). Age was selected to capture adult women of labour force age and the geographic location was selected because of its large, diverse population of immigrants. In addition, these large urban areas are arguably a very relevant geographic scale for the examination of any population-health consequences of inequity (Lochner et al., 2001). For example, health and social services are often accessed locally and experiences of difference in utilization patterns are often most obvious at the scale of the CMA (Ross et al., 2005).

2.3.2 Dependent variable

In order to examine primary health care utilization, this research focuses on individual contact with a general practitioner. Specifically, the dependent variable examines whether or not a woman has consulted with a general practitioner (GP) within the past twelve months. Among the eligible sample of women 18-69 residing in one of

the three CMAs, approximately 0.42% were lost due to non-response (don't know, refused, not stated) leaving 8,446 (*N* unweighted) for assessment. The dependent variable was coded as a binary response (yes/no) and was based on the question: "In the past twelve months, how many times have you consulted with a general practitioner/family physician?" Due to the difficulty in establishing thresholds for numbers of consultation and their interpretation, a binary variable was created, representing 'use' or 'non use' of a physician within the past year.

2.3.3 Independent variables

As suggested earlier, many factors may influence a woman's report of having consulted with a GP. Drawing upon the behavioural model of health care utilization and considering a multilevel approach, several key individual- and neighbourhood-level variables are selected for analyses.

2.3.3.1 Individual-level variables

Independent demographic variables include: age in years (centered around its mean) and marital status dummy coded to represent two categories: single or separated/widowed/divorced versus married/common law serving as the reference group. Self-reported cultural/racial origin is defined to include black, Chinese, South Asian (East Indian, Pakistani, Sri Lankan), other Asian (Filipino, Japanese, Korean, Cambodian, Laotian, Indonesian and Vietnamese), other (native, Arab, Afghan, Iranian, multiple races and self-reported other), with white cultural/racial origin as the reference group. Some subgroups are created due to very small sample sizes.

Given the research focus on the immigrant population, additional demographic characteristics related to immigration are included in the subsequent analyses. At the individual level, dummy variables were created to distinguish between recent (resident of Canada for ten years or less) and long-term (resident for more than ten years) immigrant status versus Canadian-born serving as the reference group. As a measure of acculturation, a binary language ability variable is included, which asks the respondent if she is able to converse in either English or French.

As a measure of health care need, health status is measured using self-reported general health (excellent, very good, good versus fair, poor). In addition, several socioeconomic characteristics are considered. Specifically, educational attainment and household income adequacy are included at the individual level. Income adequacy is a Statistics Canada derived variable based on household income and household size. City residency is also included. The Montreal, Toronto and Vancouver CMAs were also included as covariates in the analyses. Given that each of the three CMAs are in different provinces, these dummy variables may capture variations in health care utilization between provinces (Gravelle et al., 2003).

2.3.3.2 Neighbourhood-level variables

As an additional demographic characteristic, the neighbourhood proportion of immigrants is a variable derived from the census tract profile data from the Canadian census. Understood as an organizational factor measuring the availability of social resources or attributes of a particular area, neighbourhood disadvantage is also considered. At the neighbourhood level, a neighbourhood disadvantage index score

(NDIS) was created, derived from five variables including proportion of the total neighbourhood income coming from government transfer payments, proportion of the neighbourhood 15 years and older without a secondary school diploma, mean household income, proportion of families in the neighbourhood with household incomes below the poverty line, and proportion of individuals in the neighbourhood 15 years and older who were unemployed (Boyle and Lipman, 2002). These five variables were entered into a principal component analysis. One factor emerged that accounted for approximately 68.1 percent of the total explained variance. To represent NDIS, a factor regression score was calculated by weighting each of the five variables by its factor loading.

2.3.4 Statistical analysis

The statistical analyses entailed a multi-stage process consisting of descriptive statistics and multilevel logistic regression models. This study anticipates health care utilization to be clustered within the spatial contexts of census tracts, which is modeled by explicitly partitioning the different sources of variation. Unlike traditional multivariate methods that require aggregation or disaggregating so that variables reflect either the individual or group level, the multilevel approach can identify relationships among variables measured at both the individual and group (neighbourhood) levels. A multilevel approach is advantageous in order to account for the correlation of responses within naturally formed groupings, such as neighbourhoods (Boyle and Lipman, 2002).

Multilevel logistic regression models were developed to simultaneously consider *i* individual females (Level 1) within *j* Montreal, Toronto and Vancouver neighbourhoods

(Level 2).[3] Responses collected from individuals nested within neighbourhoods provide the basis for estimating two components of variance: one owing to variability between individuals and the other owing to variability between neighbourhoods. This model is defined as:

$$\begin{aligned} \text{logit}(\pi_{ij}) &= \beta_{0j} + \beta_i x_{ij} \\ \beta_{0j} &= \beta_0 + u_{0j} \end{aligned} \qquad (1)$$

The binary response equals 1 if woman in neighbourhood j has consulted with a GP (utilization), and 0 if she has not. The intercept consists of two terms: a fixed component, which quantifies the overall prevalence of response on a log scale; and a neighbourhood-specific residual component, the random effect represents the difference in level of utilization between the average of neighbourhood j and the overall average in the population. This random effect is assumed to follow a normal distribution with mean zero and variance; the residual component at the individual level is constrained to 1.

In models with two levels of analysis, each level is associated with its own, unexplained residual error. At the individual level, the residual error is constrained to 1 in logistic regression; each successive level is associated with its own error term, which estimates the residual between-neighbourhood variation (Snijders and Bosker, 1999). The proportion of variance accounted for by neighbourhoods can be calculated using the intra-class correlation coefficient (ICC), which is defined as $\rho = \sigma^2/(\sigma^2 + \pi^2/3)$ where

[3] Due to the small number (n=3), CMAs could not be examined as a separate or third level. It has been suggested that for multilevel models, groups of at least 20 or more are required (Hox, 1995) as the number of groups has an effect on statistical power.

$\pi^2/3=3.29$ (Snijders and Bosker, 1999). The ICC is used to judge the effect of explanatory variables included in the model (Snijders and Bosker, 1999). This coefficient is the ratio between the neighbourhood level variation and the total variation (sum of the individual and neighbourhood level variation), where a decline in the ICC indicates that the differences between neighbourhoods have been reduced by the inclusion of explanatory variables (Ross et al, 2004). Odds ratios and associated 95 percent confidence intervals were also estimated.

Based on the independent variables selected according to Andersen's behavioural model of health care utilization and including immigrant specific variables, multilevel models were built incrementally. It is important to note that although this model suggests a causal ordering of categorical variables that predict utilization, Andersen (1995) stresses that each variable can also be considered to make an independent contribution to use.

The first model is the null model with no explanatory variables, which is used to estimate the relative importance of individual and neighbourhood effects in accounting for variation in the outcome (Ross et al., 2005). From the null model, additional models were built incrementally first controlling for age, health-related covariates, SES, marital status, followed by neighbourhood disadvantage in the third model. Then the neighbourhood proportion of immigrant and immigrant-related variables were added to create model 4. In the fourth model, CMA covariates were included. With the final addition of cultural/racial origin (model 5), the full model was created.

2.4 Results

Table 2.1 shows the characteristics of women included in the analyses with their responses to key variables. Overall, the proportion of the sample (weighted) of those reporting having had no contact with a GP within the past twelve months prior to being surveyed was 18 percent. Conversely, 82 percent of women reported having consulted with a GP. This table provides a description of the study sample, which represented 3,544,251 (weighted) females aged 18 to 69 years of age, residing in the Montreal, Toronto and Vancouver CMAs. Additional descriptive characteristics are presented in Table 2.2. This table provides a description of those who have consulted with a GP within the past twelve months.

Focusing on the total sample of women living within these major urban centers, 39.2 percent were immigrants. Recent immigrant women represented slightly less than 15 percent of the sample. Similar to their native-born and longer-term counterparts, the majority of recent immigrants reported being married, having a post secondary level of education and reporting positive health. In terms of self-reported cultural/racial background, the vast majority of native-born respondents reported being white (91.2 percent), whereas recent immigrants were predominantly Chinese (26.4 percent), white (21.3 percent), South Asian (16.9 percent) with long-term immigrants reporting white (46.5 percent) and Chinese (15.2 percent) origins. On average, the mean age of the total sample was 41, with the average recent immigrant being 35, native-born 40, and long-term immigrant being 48. Given the age distribution, it is not surprising that 85 percent of

long-term immigrants reporting having consulted with a GP compared to 81 percent of the native-born and 80 percent of the recent immigrant counterparts.

In terms of residing in areas of neighbourhood disadvantage, these rates appear to considerably higher for recent immigrants, compared to their long-term and native-born counterparts. Not surprisingly, recent immigrants also live in areas with higher concentrations of immigrants then their long-term and native-born counterparts. However, these groups are not far behind. Additional descriptive results are presented in Table 2.2. This table presents selected characteristic of the sample who reported having consulted with a GP.

Table 2.3 presents a series of increasingly complex multilevel models, which are the logistic regression models for GP utilization. In particular, this set of results focuses on the fixed effects associated with having consulted with a GP among immigrant and native-born women sampled. The first model is the null model. After controlling for age and self-reported health status, the model (model 2) begins by examining individual level education, income and martial status characteristics. In addition to age, those reporting a high level of income adequacy are more likely to have consulted with a GP. In line with theoretical expectation, positive (excellent, very good or good) health status is negatively association with utilization. Next, model 3 examines the influence of neighbourhood contexts, wherein neighbourhood disadvantage exhibits a strong negative association with utilization. Adding to this model, the distal influence of immigrant concentration and immigrant status are examined in model 4. Most notably, the concentration of

immigrants exhibits a strong positive association. Yet, recent immigrant status is negatively associated with utilization. Long-term immigrant status is insignificant.

Model 5 examines the extent to which the CMA is associated with utilization. Relative to Montreal, residence in either the Toronto or Vancouver CMAs is positively association with utilization. This demonstrates the potential for difference between provinces. Once CMA is controlled, reporting a post secondary education becomes significant and positively associated with utilization. However, neighbourhood disadvantage is reduced to non-significance.

Model 6 reveals the full model, which considers cultural/racial origin in addition to the preceding set of variables. Of particular interest, results reveal that women reporting Chinese, Filipino and other Asian (Korean and Japanese) cultural origins are less likely to have consulted with a GP within the past twelve months than their white (reference group) counterparts. These cultural origins are negatively associated with utilization. While neighbourhood disadvantage continues to be significantly and negatively associated with utilization, the association between recent immigrant status becomes non-significant. Therefore, it could be suggested that the effect of cultural origin reduces individual immigrant status to non-significance.

Although substantially decreased, the neighbourhood concentration of immigrants remains statistically significant and positively associated with utilization. Additional characteristics positively associated with utilization in the full model include age, reporting a post-secondary education (relative to a high school education), high-income

adequacy (relative to middle income adequacy), and resident in either the Toronto or Vancouver CMAs (relative to the Montreal CMA).

Table 2.4 presents the results for the random effects, highlighting the evidence of between neighbourhood variations in utilization. According to the null model, the amount of variation attributable to neighbourhoods was approximately 5%. Although moderate, neighbourhood variation in utilization exists. After controlling for demographic, health status, and individual socio-economic factors, model 2 explains only a small proportion of this between neighbourhood variability. Furthermore, the amount of variation is only slightly decreased with the addition neighbourhood disadvantage in model 3 (ICC = 4.6%). However, model 4 reveals that the concentration of immigrants at the neighbourhood level and immigrant status exhibit strong associations with utilization, and account for a little less than half of the between neighbourhood differences. In this model, the intra-class correlation coefficient is 2.9%. Most notably, CMA residency (model 5) and individual cultural origin (model 6) appears to further explain the between neighbourhood variability. In the final and full model (model 6), the intra-class correlation coefficient is reduced to 1.5%. Overall, the variation in utilization appears to be largely accounted for by several demographic and socio-economic characteristics of individuals along with contextual characteristics, such as neighbourhood concentration of immigrants.

2.5 Discussion and conclusion

This paper has investigated the health seeking behaviours, represented by contact with a general practitioner, within a sample of immigrant and native-born women residing in urban Canada. Drawing upon the behavioural model of health care utilization, several predisposing, enabling, and need-related characteristics are important in explaining this outcome. While a number of theoretically important characteristics proved to be insignificant in the multilevel models, Andersen's conceptualization has been helpful in characterizing the population less likely to have had at least one consultation with a general practitioner in the past twelve months. Given the focus of native-born and foreign-born women in Canada, immigrant status was included as a potential factor.

This study builds upon existing literature that recognizes diverse factors may influence whether an individual utilizes the services of a general practitioner. Factors such as education, social support and region of residence (Birch et al., 1993; Dunlop et al. 2000) can impact utilization within the general population. This study builds upon previous research; for example, Eyles et al. (1995) stress the importance of demographic variables in explaining the use of a family physician. While Eyles et al (1995) did not include immigrant status, the results of this research highlight the importance of its consideration. Building upon the existing literature in this area (McDonald and Kennedy, 2004; Newbold, 2005a), findings from this research suggest that recent immigrant status is significantly and negatively associated with utilization, even after controlling for age, health status, other demographic characteristics and socioeconomic status.

Results also reveal that cultural characteristics were significantly associated with utilization. Specifically, contact with a general practitioner is less likely to be reported among women of Chinese, Filipino and other Asian (Korean and Japanese) cultural backgrounds. In fact, cultural origin reduced the importance of recent immigrant status (negatively associated with utilization) to non-significance. This could suggest that it is the likely need for tailoring health care messages to recent immigrants of these particular cultural backgrounds. Overall, the results of this study suggest that individual-level (in addition to neighbourhood- and CMA-level) characteristics influence the utilization of primary health care, as measured through contact with a general practitioner.

In addition to age, health status, education, income adequacy and cultural origin modified the association between utilization (stronger associations at higher levels). Most notably, neighbourhood level variables exerted a significant influence on utilization. Neighbourhood disadvantage was negatively associated, while the neighbourhood concentration of immigrants was positively associated. The independent importance of these factors suggests that high-need neighbourhoods may have important implications for health policy and planning. The utilization of primary care, such as that available through a general practitioner or family doctors, can be very important determinant of health (Field and Briggs, 2001).

Overall, this research suggests that important associations between contextual factors and utilization remain, even after controlling for individual-level factors. The between-neighbourhood variation was accounted for partially by the socioeconomic and demographic characteristics of the women in the study, even after controlling for age and

health status. Self-reported cultural origin also accounted for this variation. Finally, the CMA of residence also played a significant role in use. Based on these results, this research concludes that neighbourhoods appear to play an important role above and beyond individual characteristics. Contextual characteristics of the environment in which a woman lives are significantly associated with her report of health care utilization.

As mentioned above, there maybe a need to focus on places in addition to people, as well as better targeting of primary health care services to vulnerable populations. Findings suggest that the role of neighbourhood context and individual characteristics in explaining individual utilization of general practitioner services is complex. Immigrant status and neighbourhood concentration of immigrants appear to influence utilization within the three CMAs examined. As Canada's immigrant population represents a growing and extremely heterogeneous group (Statistics Canada, 2005), cultural origin appears to influence utilization. Important health care messages could be tailored to reflect the perceptions and beliefs of particular cultural groups. While this research cannot suggest a causal pathway, this cross-sectional analysis has highlighted clear differences at the individual and contextual level. Clearly, there is a need to understand health care utilization in immigrant populations, which can anticipate their health needs more effectively.

2.6 References

Aday LA, Andersen RM. (1974). A framework for the study of access to medical care. *Health Services Research,* 9: 208-220.

Ali, J. (2002). *Mental Health of Canada's Immigrants*. Supplement to health reports, Statistics Canada, Catalogue 82-003-SIE, pp. 1-11.

Ali, J., McDermott, S., and Gravel, R. (2004). Recent Research on Immigrant from Statistics Canada's Population Surveys. *Canadian Journal of Public Health, May/June, 95*(3): 19-24.

Andersen, R.M. (1968). *Behavioral model of families' use of health services*. Research Series No. 25. Chicago, IL: Center for Health Administration Studies, University of Chicago.

Andersen, R.M. (1995). Revisiting the behavioral model and access to medical care. *Journal of Health and Social Behavior,* 36(1): 1-10.

Antecol, H. and Bedard, K. (2004). *Unhealthy assimilation: do immigrants converge to American weights?* Claremont McKenna College, Working Paper Series 2004-06. (Accessed on 15 November 2005, URL: http://opus.zbw-kiel.de/volltexte/2005/2701/pdf/2004-06.pdf)

Beiser, M. (2005). The health of immigrants and refugees in Canada. *Canadian Journal of Public Health,* 96: S30-S44.

Birch, S., Eyles, J. and Newbold, K.B. 1993. Equitable access to health care: Methodological extensions to analysis of physician utilization in Canada. *Health Economics,* 2: 87-101.

Boyle, M.H., Lipman, E,L. (2002). Do Places Matter? Socioeconomic disadvantage and behavioural problems of Children in Canada. *Journal of Consulting and Clinical Psychology,* 70(2): 378-389.

DesMeules, M, Gold, J, Kazanjian, A, Manuel, D. et al. (2004). New Approaches Immigrant Health Assessment. *Canadian Journal of Public Health,* 95(3): I22-I26.

Donovan, J., d'Espaignet, E., Metron, C., and van Ommeren, M. eds. (1992). *Immigrants in Australia: A Health Profile*. Australian Institute of Health and Welfare Ethnic Health Series, No 1. Canberra: AGPS.

Dunlop, S., Coyte, P.C., and McIsaac, W. 2000. Socio-economic status and the utilization of physicians' services: results from the Canadian National Population Health Survey. *Social Science and Medicine,* 51:123-133.

Dunn, J.R., and Dyck, I. (2000). Social determinants of health in Canada's immigrant population: Results from the National Population Health Survey. *Social Science and Medicine*, 51: 1573-1593.

Eyles, J., Birch, S. and Newbold, K.B. 1995. Delivering the goods? Access to family physician services in Canada: A comparison of 1985 and 1991. *Journal of Health and Social Behaviour,* 36: 322-332.

Field, K.S., and Briggs, D.J. 2001. Socio-economic and locational determinants of accessibility and utilization of primary health-care. *Health and Social Care in the Community*, 9(5): 294-308.

Fowler, N. (1998). Providing primary health care to immigrants and refugees: the North Hamilton experience. *Canadian Medical Association Journal,* 159(4): 388-391.

Frisbie, W.P., Youngtae, C., and Hummer, R.A. (2001). Immigration and the health of Asian and Pacific Islander adults in the United States. *American Journal of Epidemiology,* 153(4): 372-380.

Fylkesnes, K. (1993). Determinants of health care-utilization visits and referrals. *Scandinavian Journal of Social Medicine,* 21: 40-50.

Galarneau, D., and Morissette, R. (2004). Immigrants: Settling for Less? *Perspectives on Labour and Income*, Statistics Canada. Catalogue 75-001, 5(6): 5-16.

Gee, E., Kobayashi, K., and Prus, S. (2003). *Examining the "Healthy Immigrant Effect" in Later Life: Findings from the Canadian Community Health Survey.* McMaster University, SEDAP Research Paper 98.

Glazier, R.H., Creatore, M.I., Gozdyra, P., Matheson, F.I., Steele, L.S., Boyle, E., et al. (2004). Geographic methods for understanding and responding to disparities in mammography use in Toronto, Canada. *Journal of General Internal Medicine*; 19: 952-961.

Goel, M.S., Wee, C.C., McCarthy, E.P., et al. (2003). Racial and Ethnic Disparities in Cancer Screening: the importance of foreign-birth as a barrier to care. *Journal of General Internal Medicine,* 18: 1028-1-35.

Health Canada. (1999). *Canadian Research on Immigration and Health.* Ottawa: Ministry of Health.

Heisz, A., and McLeod, L. (2004). Low-income in Census Metropolitan Areas, 1980-2000. Statistics Canada No. 89-613-MIE, No. 001. Ottawa: Statistics Canada.

Hyman, I. (2001). *Immigration and Health.* Health Canada. Health Policy Working Paper Series. Working paper 01-05. Available at: http://www.hc-sc.gc.ca/sr-sr/alt_formats/iacb-dgiac/pdf/pubs/hpr-rps/wp-dt/2001-0105-immigration/2001-0105-immigration_e.pdf . Accessed: 03/22, 2006.

Hyman, I. (2004). Setting the Stage: Reviewing Current Knowledge on the Health of Canadian Immigrants: What is the Evidence and Where are the Gaps? *Canadian Journal of Public Health, 95*(3): 14-19.

Hyman I., Guruge S. (2002). A review of theory and health promotion strategies for new immigrant women. *Canadian Journal of Public Health,* 93(3): 183-187.

Health Canada. (2001). *Certain Circumstances: Issues of Equity and Responsiveness in Access to Health Care in Canada.* Ottawa, Minister of Public Works and Government Services.

Jang, M., Lee, E., and Woo, K. (1998). Income, Language, and Citizenship Status: Factors affecting the health care access and utilization of Chinese Americans. *Health and Social Work,* 23(2): 136-145.

Jasso, G., Massey, D.S., Rosenzweig, M.R., Smith, J.P. (2004). *Immigrant Health: Selectivity and Acculturation.* Institute for Fiscal Studies, Working Paper Series 04/23. (Accessed on 15 November 2005, URL: http://www.ifs.org.yk/wps/wp0423.pdf).

Law, M., Wilson, K., Eyles, J., Elliot, S., Jerrett, M., Moffat, T. and Luginaah, I. (2005). Meeting Health Need, Accessing Health Care: the Role of Neighbourhood. *Health and Place,* 11: 367-377.

Laroche, M. (2000). Health status and health services utilization of Canada's immigrant and non-immigrant populations. *Canadian Public Policy*, 24(1): 51-75.

Leduc, N. and Proulx. M. (2004). Patterns of health services utilization by recent immigrants. *Journal of Immigrant Health,* 6(1): 15-27.

Leclere, F., Jensen, L. and Biddlecom, A. (1994). Health care utilization, family context, adaptation among immigrants to the United States. *Journal of Health and Social Behaviour,* 35: 370-384.

Litaker, D., Koroukian, S.M., and Love, T.E. (2005). Context and healthcare access: looking beyond the individual. *Medical Care*, 43(6): 531-540.

Macintyre, S. and Ellaway, A. (2003). Neighbourhoods and health: an overview. In Kawachi, I. and Berkman, L.F. (eds). Neighbourhoods and Health. Oxford, New York: 20-42.

McDonald, J.T., and Kennedy, S. (2004). Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. *Social Science and Medicine,* 59: 1613-1627.

Meadows, L.M., Thurston, W.E., and Melton, C. (2001). Immigrant women's health. *Social Science and Medicine*, 52: 1451-1458.

Newbold, KB. (2005a). Health status and health care of immigrants in Canada: a longitudinal analysis. *Journal of Health Services Research and Policy*, 10(2): 77-83.

Newbold, K.B. (2005b). Self-Rated Health Within the Canadian Immigrant Population: Risk and the Healthy Immigrant Effect. *Social Science and Medicine,* 60: 1359-1370.

Newbold, K.B., and Danforth, J. (2003). Health Status and Canada's immigrant population. *Social Science and Medicine,* 57: 1981-1995.

Newbold, K.B., Eyles, J., and Birch, S. (1995). Equity in health care: methodological contributions to the analysis of hospital utilization within Canada. *Social Science and Medicine* 40(9): 1181-1192.

Oxman-Martinez, J., Abdool S.N., and Loiselle-Leonard M. (2000). Immigration, Women and Health in Canada. *Canadian Journal of Public Health, 91*(5): 394-395.

Pérez, C. E. (2002). Health status and health behaviour among immigrants. *Supplement to health reports,* Statistics Canada, catalogue 82-003-SIE, p. 112.

Pickett KE, Pearl M. (2001). Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *Journal of Epidemiology and Community Health*, 55:111-122.

Remennick, L.I. (1999). Preventive behavior among recent immigrants: Russian-speaking women and cancer screening in Israel. *Social Science and Medicine,* 48: 1669-1684.

Ross, N.A., Dorling, D., Dunn, J.R., Henriksson, G., Glover, J., Lynch, J., et al. (2005). Metropolitan income inequality and working-age mortality: a cross-sectional analysis using comparable data from five countries. Journal of Urban Health; 82(1):101-110.

Ross, N.A., Tremblay, S.S., Graham, K. (2004). Neighbourhood influences on health in Montreal, Canada. *Social Science and Medicine,* 59(7):1485-1494.

Salant, T. and Lauderdale, D.S. (2003). Measuring culture: a critical review of acculturation and health in Asian immigrant populations. *Social Science and Medicine,* 57: 71-90.

Statistics Canada. (2003). *Canada's ethnocultural portrait: The changing mosaic.* 2001 Census Analysis Series. (Last Accessed on 5 December 2005, URL: http://www12.statcan.ca/english/census01/products/analytic/companion/etoimm/canada.htm).

Statistics Canada. (2005). *Proportion of Foreign-born Population,* 1991- 2001 Census. (Last Accessed on 2 December 2005, URL: http://www40.statcan.ca/l01/cst01/demo46a.htm).

Stephen, E.H., Foote, K., Hendershot, G.E., and Schoenborn, C.A. (1994). Health of the Foreign-Born Population. *Advance Data from Vital and Health Statistics,* 241: 1-10.

Snijders T, Bosker R. (1999). Multilevel analysis: an introduction to basic and advanced multilevel modeling. London: SAGE Publications.

Veugelers, P. J., Yip, A. M. and Burge, F. (2004). Inequities in Health and Health Services Delivery: A Multilevel Study of Primary Care and Hypertension Control. *Chronic Diseases in Canada, A Public Health Agency of Canada Publication* 24(3/4).

Williams, D.P. and Hampton, A. (2005). Barriers to Health Services Perceived by Marshallese Immigrants. *Journal of Immigrant Health,* 7(4): 317-326.

Woloshin,S., Schwartz, L.M., Katz, S.J., and Welch, G. (1997). Is language a barrier to the use of preventive services? *Journal of General Internal Medicine,* 12(8): 472-477.

Wu, Z., and Schimmele CM. (2005). *Health care utilization of later-stage immigrants in British Columbia.* Research on Immigration and Integration in the Metropolis,

Working Paper Series, No. 05-15. (Accessed: 3 November 2005, URL: http://www.riim.metropolis.net/research-policy/research-policy2/papers_e7.htm)

Yip, A. M., Kephart, G., and Veugelers, P. J. (2002). Individual and Neighbourhood determinants of health care utilization. *Canadian Journal of Public Health,* 93(4): 303-307.

Table 2.1 Descriptive characteristics (%) of sample, weighted
Consultation with a GP/family doctor in the past twelve months

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Sample	100	60.8	14.9	24.3
Consultation with GP/family doctor				
No	18	18.7	20.4	14.7
Yes	82	81.3	79.6	85.3
Age (Mean)	41	40	35	48
Marital Status				
Married, Common-law	61.8	56.7	69.2	69.8
Separated, Divorced, Widowed	12.6	12.3	8.5	16.1
Single	25.6	31	22.3	14.2
Educational Attainment				
Less than High School	13.5	11.1	14.4	19.1
High School Graduate	27.1	28.3	25.5	25.2
Post Secondary Graduate	59.4	60.6	60	55.7
Household Income Adequacy				
Low	10	7	25.9	8.9
Middle	50.4	47	59.6	54
High	39.6	46.1	14.5	37.1
Self-Reported General Health				
Negative (Fair, Poor)	10.7	8.5	10	16.8
Positive (Excellent, Very Good, Good)	89.3	91.5	90	83.2
Can Converse in English and/or French				
Yes	95.3	99.6	82.7	92.3
No	4.7	0.4	17.3	7.7
Cultural/Racial Origin				
White	69.9	91.2	21.3	46.5
Black	3.9	1.3	6.4	9.1
Other Asian	0.9	0.3	3.2	0.9
Filipino	2.2	0.5	5	4.6
Chinese	8.8	1.9	26.4	15.2
South Asian	5.3	0.8	16.9	9.4
South East Asian	1.2	0.4	2.6	2.3
Latin American	2.1	0.3	5.7	4.3
Other	5.8	3.4	12.5	7.7
Neighbourhood Proportion of Immigrants (Mean)	0.35	0.28	0.5	0.44
Neighbourhood Disadvantage Index Score (Mean)	0.06	-0.04	0.47	0.08
N (weighted)	3,544,251	2,154,860	528,125	861,266

Table 2.2 Descriptive characteristics (%) of sample reporting Yes, weighted
Consultation with a GP/family doctor in the past twelve months

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Sample	100	60.26	14.46	25.28
Consultation with GP/family doctor				
Yes	100	100	100	100
Age (Mean)	42	41	36	48
Marital Status				
Married, Common-law	62.4	57.3	70.8	69.7
Separated, Divorced, Widowed	13.3	12.9	9.4	16.3
Single	24.3	29.7	19.7	14
Educational Attainment				
Less than High School	13.8	10.8	15.5	19.9
High School Graduate	26.3	27.1	25	25
Post Secondary Graduate	60	62.1	59.5	55.2
Household Income Adequacy				
Low	9.9	6.7	24.9	9.6
Middle	49.8	46	61.3	53.1
High	40.3	47.3	13.8	37.4
Self-Reported General Health				
Negative (Fair, Poor)	11.6	8.9	11.4	18.1
Positive (Excellent, Very Good, Good)	88.4	91.1	88.6	81.9
Can Converse in English and/or French				
Yes	95.2	99.6	83.2	91.3
No	4.8	0.4	16.8	8.7
Cultural/Racial Origin				
White	70.4	91.9	20.9	47.6
Black	4	1.4	6.1	8.9
Other Asian	0.6	0.3	1.7	0.8
Filipino	1.9	0.1	4.4	4.6
Chinese	9	1.8	27.5	15.7
South Asian	5.6	0.8	19.1	9.2
South East Asian	1.1	0.4	2.5	2.1
Latin American	1.8	0.1	4.9	4
Other	5.6	3.3	12.9	7.2
Neighbourhood Proportion of Immigrants (Mean)	0.36	0.29	0.51	0.44
Neighbourhood Disadvantage Index Score (Mean)	0.04	-0.08	0.46	0.06
N (weighted)	2,907,818	1,752,260	420,548	735,010

Table 2.3 Multilevel logistic regression models: Consultation with a GP/family doctor in the past twelve months

Fixed Effects	Null Model β (se)	Model 2 β (se)			Model 3 β (se)			Model 4 β (se)			Model 5 β (se)			Model 6 β (se)		
Intercept	1.57‡ (0.03)	1.93‡ (0.12)			1.95‡ (0.12)			1.53‡ (0.03)			1.417‡ (0.13)			1.40‡ (0.13)		
			95% CI			95% CI			95% CI			95% CI			95% CI	
		OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper
Age Centred		1.01 ‡	1.01	1.02	1.01 ‡	1.01	1.02	1.01 ‡	1.00	1.02	1.01 ‡	1.00	1.02	1.01 ‡	1.00	1.02
Self-Reported Health (ref=negative)																
Positive		0.63 ‡	0.51	0.79	0.58 ‡	0.46	0.72	0.58 ‡	0.47	0.73	0.58 ‡	0.47	0.73	0.58 ‡	0.47	0.73
Education (ref=High School Graduate)																
Less than High School		0.97	0.80	1.18	1.00	0.82	1.22	1.05	0.87	1.29	1.11	0.91	1.36	1.11	0.91	1.35
Post Secondary Graduate		1.13	0.99	1.28	1.13	0.99	1.29	1.14	1.00	1.30	1.20 †	1.05	1.37	1.22 †	1.06	1.39
Income Adequacy (ref=middle)																
Low		0.89	0.73	1.09	0.93	0.76	1.14	0.98	0.80	1.19	0.99	0.81	1.21	1.00	0.81	1.22
High		1.30 ‡	1.14	1.49	1.25 ‡	1.09	1.43	1.20 *	1.05	1.38	1.20 *	1.04	1.38	1.19 *	1.04	1.37
Marital Status (ref=Married/Common-law)																
Separated, Widowed, Divorced		1.13	0.95	1.34	1.13	0.20	6.46	1.13	0.95	1.34	1.12	0.94	1.33	1.09	0.92	1.30
Single		0.96	0.83	1.12	0.97	0.84	1.12	0.89	0.77	1.04	0.91	0.78	1.06	0.92	0.79	1.07
Neighbourhood Disadvantage Index Score					0.89 ‡	0.84	0.95	0.84 ‡	0.79	0.89	0.50	0.46	0.53	0.93 *	0.86	1.00
Neighbourhood Proportion of Immigrant								5.02 ‡	3.49	7.21	1.68 *	1.06	2.67	1.86 †	1.16	2.97
Immigrant Status (ref=Native-born)																
Recent Immigrant (0-10 Years in Canada)								0.69 ‡	0.56	0.84	0.69 ‡	0.56	0.84	0.81	0.64	1.01
Long-term Immigrant (11+ Years in Canada)								0.89	0.75	1.05	0.88	0.75	1.04	0.96	0.79	1.15
CMA (ref=Montreal)																
Toronto											1.77 ‡	1.46	2.15	1.75 ‡	1.44	2.12
Vancouver											2.21 ‡	1.83	2.68	2.38 ‡	1.96	2.89
Cultural/Racial Origin (ref=White only)																
Black														1.38	0.93	2.04
Other Asian														0.24 ‡	0.15	0.38
Filipino														0.48 ‡	0.32	0.72
Chinese														0.75 *	0.57	0.98
South Asian														1.17	0.81	1.68
South East Asian														0.75	0.42	1.37
Latin American														0.64	0.40	1.02
Other														0.84	0.64	1.11

* p <0.05, † p <0.01, ‡ p <0.001, OR Odds Ratio, 95% CI Confidence Interval

Table 2.4 Summary of variance components (standard errors), multilevel logistic regression: Consultation with a GP/family doctor in the past twelve months

Random Effects	Null Model	Model 2	Model 3	Model 4	Model 5	Model 6
Level 2, Neighbourhood	0.172(0.05)	0.170(0.05)	0.159(0.05)	0.098(0.04)	0.057(0.04)	0.050(0.04)
Level 1, Individual	1.00	1.00	1.00	1.00	1.00	1.00
Intra-class correlation coefficient (%)	4.97	4.91	4.61	2.89	1.70	1.50

CHAPTER THREE:

Preventive Oncology: Immigrant women's use of cervical cancer screening services

3.1 Abstract

Contextual factors may play an influential role in determining individual uptake of preventive health care services, especially among potentially vulnerable subpopulations. Using cervical cancer screening as a case study, this paper examines the multilevel factors associated with Pap (smear) testing in native-born and immigrant women. Cross-sectional multilevel logistic regression models were used to identify the individual and neighbourhood level characteristics that might explain differences in the lifetime uptake of Pap testing and regular use of Pap testing among immigrants and native-born women between the ages of 18 and 69 residing in the Montreal, Toronto and Vancouver Census Metropolitan Areas (CMAs). Individual level data was drawn from the Canadian Community Health Survey (Cycle. 2.1, 2003) and linked with census tract profile data from the Canadian Census (2001). Findings reveal significant between-neighbourhood variation in uptake. After controlling for age, marital status, self-report health status, contact with a general practitioner and socio-economic status, a woman's immigrant status and cultural origin appears to be significantly associated with ever having had a Pap test. Uptake appears to be less common among recent immigrant women and women of Chinese, South Asian and other Asian backgrounds, in addition to

poor health and infrequent contact with a general practitioner. Among those that have participated in Pap testing, results reveal neighbourhood disadvantage and concentration of immigrants is associated with having had a (regular) test within the past three years. Neighbourhood concentration of immigrants is positively associated with regular use, in addition to other significant individual-level covariates such as age, self-rated health and contact with a general practitioner. To conclude, there appears to be significant differences among individuals between neighbourhoods and CMAs in the utilization of cervical cancer screening services. Overall findings point to the role of cultural origin, which largely accounts for these differences in uptake. This stresses the likely need to promote greater information and awareness of public health services for cervical cancer screening, most especially to recent immigrant women with such backgrounds. In the context of this research, community interventions at the neighbourhood level may be particularly useful in reaching vulnerable populations.

MeSH terms: *Women's health; environment, preventive medicine and public health; Papanicolaou smear; immigrants; cross-sectional studies.*

3.2 Introduction

Cervical cancer is one of the most common malignant diseases in women (Duarte-Franco and Franco, 2003), with an estimated 9,900 potential years of life lost due to this disease in Canada in 2003 (National Cancer Institute of Canada, 2007) and affecting women of all ages (Health Canada, 2002). Given its slow progression, identifiable cytological precursors and effective treatments, cervical cancer is one of the most preventable human cancers (Franco et al., 2001; Leyden et al., 2005). With regular cervical cancer screening, this significant disease is preventable and curable when detected at an early stage (Fehringer et al., 2005; Johnston, Boyd and MacIsaac, 2004; Yi, 1994).

Cervical cancer screening uses a Pap smear consisting of an intravaginal scraping of cervical cells, which are fixed onto a slide and then microscopically examined for premalignant or malignant changes (Gupta et al., 2002). Early detection provides the opportunity to observe any signs of pre-cancerous changes and eliminate abnormal cells before they become cancerous. According to the Canadian Task Force on Preventive Health Care (formerly the Periodic Health Examination) and guidelines from the National Workshop on Screening for Cancer of the Cervix (Miller et al., 1991; Morrison, 1994), screening is recommended following the initiation of sexual activity or at age 18. After two normal smears, regular Pap testing is advised every three years until the age of 69.

While more frequent testing may be considered for women at high risk (first intercourse at less than 18 years of age, multiple sexual partners, partner with multiple sexual partners, low socioeconomic status) (Health Canada, 2002), participation in Pap

smear testing is well understood to be the most effective means of decreasing mortality rates from this invasive cancer (Fehringer *et al.*, 2005; Miller *et al.*, 1991; Johnston *et al.*, 2004). Pap testing is effective in preventing invasive cervical cancer (Health Canada, 2002; Miller et al., 1991; Eddy, 1990; Health Canada, 2002).

While overall mortality rates from this disease are decreasing (National Cancer Institute of Canada, 2007; Miller et al., 1991; Eddy, 1990), approximately 50 percent of women with invasive cervical cancer have never had a Pap test (Parboosingh et al., 1997). Most notably, failure to participate in Pap testing is the single greatest risk factor for poor outcomes in women who develop cervical cancer (Health Canada, 1998; Morrison, 1994).

Recent immigrant women, defined as residing in Canada for ten years or less, may be at a higher risk for cervical cancer. This is primarily because this group have lower rates of Pap testing (Duarte-Franco and Franco, 2003). For example, a recent study reported that 27 percent of immigrant women in Hamilton-Wentworth have never had a Pap test, compared to 9 percent of non-immigrant women (Black and Zsoldos, 2003). Drawing upon the literature, research reveals that recent immigrants are typically less likely to be screened for chronic conditions and cancers compared to their longer-term immigrant and native-born counterparts (DesMeules et al., 2004; Goel, 1994; Hyman and Guruge, 2002; Leduc and Proulx, 2004; McDonald and Kennedy, 2005; Newbold, 2005).

Lack of knowledge, unease, and the cultural incongruity that immigrants experience upon arrival may deter the use of health services (Hyman, 2001), especially those services that are not necessarily considered essential by the individual. Additional

factors associated with a lack of screening include being single, older, reporting low income, low level of education, and speaking neither English nor French (Goel, 1994; Bryant et al., 2002). Coupled with the fact that immigrants represent 18.4 percent of the Canadian population (Statistics Canada, 2005) a growing number of women may be at risk.

In the context of immigrant settlement, immigrants tend to be highly concentrated within the nation's largest and most diverse cities. Toronto, Vancouver and Montreal represent the largest immigrant receiving centres in Canada, with 43.7 percent of the total immigrant population in Canada choosing to live in Toronto, 37.5 percent in Vancouver and 18.4 percent in Montreal in 2001 (Statistics Canada, 2005). Often settling in affordable and low-income areas (Glazier et al., 2004), recent immigrants may be particularly vulnerable.

Interactions between areas and people may also influence screening participation. Independent of individual characteristics, it is recognized that an individual's immediate environment may possess both material and social characteristics that are potentially linked to her health-seeking behaviours (Ross, Tremblay and Graham, 2004; Glazier et al., 2004; Diez Roux, 2001). For example, neighbourhoods could be sources of important information and support with regard to screening (McDonald and Kennedy, 2005). Given that immigrants as a group are less likely to participate in these services, knowledge of these health services may be less likely to occur when immigrants are living closely together. Areas with high immigrant concentrations may face even greater risk. Area level or neighbourhood characteristics might help explain the uptake of preventive health

care behaviours. Notably, the independent importance of individual and neighbourhood factors on this type of preventive care has not been investigated. Few studies adequately examine the role neighbourhood plays in the uptake of preventive health care. Here the focus is on both downstream (individual-level characteristics or risk factors) and upstream factors (broader societal or neighbourhood contexts) by examining the multilevel and cross-level influences on cervical cancer screening utilization.

Moreover, immigrant women represent an understudied population. This segment of the Canadian population is becoming an increasingly diverse group, with increasing numbers of arrivals from Asia, Africa, the Caribbean, Latin America and Eastern Europe (Citizenship and Immigration Canada, 2001). This is also important in that socio-cultural barriers may be affecting health care utilization more than ever before. Canada's immigrant population is becoming a more heterogeneous group, which may ultimately lead to further disparities among cultural groups in rates of cervical cancer incidence and mortality (Duarte-Franco and Franco, 2003).

Therefore, the purpose of this paper is to investigate the multilevel characteristics associated with the utilization (uptake and regular use) of preventive cervical cancer screening in immigrant and native-born women residing in Canada's largest Census Metropolitan Areas (CMAs). In order to address these objectives, the following questions are investigated: (1) is there evidence of between neighbourhood variation in the utilization of cervical cancer screening? (2) Does the neighbourhood concentration of immigrants account for between area differences? (3) Does utilization differ between immigrant and native-born women? (4) To what extent does CMA moderate the

association between immigrant status and utilization? (5) Is there evidence of cultural differences?

3.3 Methodology

3.3.1 Data

Data is primarily drawn from Cycle 2.1 (2003) of Statistics Canada's Canadian Community Health Survey (CCHS) master file. The objective of the CCHS is to provide timely, reliable, cross-sectional estimates of health determinants, health status and health system use at sub-provincial levels. A multi-stage stratified cluster design was used to sample household dwellings, which covered approximately 98 percent of the Canadian population aged 12 and older living in private households. Additional data comes from the 2001 Canadian census public use mirco-data file, which offers demographic, social and economic information on the population of Canada at various geographical scales. Using Statistics Canada's postal code conversion file to link with the postal codes of CCHS respondents, the 2001 census was used to provide demographic and socio-economic measures for the census tracts (neighbourhoods) in which respondents were residing. In their comparison of several "neighbourhood" units of analysis, recent Canadian research suggests that census tracts are good proxies for natural neighbourhood boundaries in studies of neighbourhood effects on health (Ross et al., 2004).

3.3.2 Sample for Analysis

Women between the ages of 18 and 69, residing in the Montreal, Toronto and Vancouver CMAs were selected. Two dependent variables are considered. The first dependent variable asks whether the respondent has ever had a Pap test. This variable captured individual lifetime use of cervical cancer screening, which may include having had a Pap test in countries other than Canada (*N* unweighted = 8,327). The second dependent variable asks those who reported ever having had a Pap test whether the respondent has had a Pap test within the past three years. The construction of this variable is based upon the recommended screening guidelines in Canada, which recommends that women have regular Pap testing at least every three years. This variable examines regular use of cervical screening services and is a binary variable.[4] Approximately 2.8 percent of this sample was lost due to non-response (don't know, refused, not stated).

3.3.3 Variables and Measures

Based on a review of the literature, demographic, health, acculturation and socio-economic variables associated with the uptake of cervical cancer screening were identified (see Appendix I). Independent individual-level variables included age, marital status and cultural origin (based on self-reported cultural/racial origin), self-reported general health, contact with a general practitioner in the past year, and immigrant status. Immigrant status was distinguished between recent (resident for ≤ 10 years) and long-term (resident > 10 years) immigrants, versus native-born (Canadian-born). As a measure

[4] It is important to note that having had a Pap test within the past three years may not be able capture 'regular' screening; this could be the case if a woman's one and only test has been in this three year window.

of acculturation, a woman's ability to speak at least one of Canada's official languages was included. Socio-economic characteristics included educational attainment and household income adequacy.

Derived from the census tract profile data from the Canadian census, the neighbourhood proportion of immigrants was also included. The percentage of immigrants at the neighbourhood (census tract) level was expressed in increments of 10 (i.e., 25 percent took on a value of 2.5). In addition, a neighbourhood disadvantage index score (NDIS) was derived from five variables (described in the Appendix I) (Boyle and Lipman, 2002). These five variables were entered into a principal component analysis. One factor emerged that account for approximately 68.0 percent of the total explained variance. To represent NDIS, a factor regression score was calculated by weighting each of the five variables by its factor loading.

3.3.4 Statistical Analyses

The analyses entailed a multi-stage process consisting of descriptive statistics and multilevel logistic regression models. Unlike traditional multivariate methods that require aggregation or disaggregating so that variables reflect the individual or group level, a multilevel approach can identify relationships among variables measured at both the individual and group levels. This approach is needed to account for the correlation of responses within naturally formed groupings, such as neighbourhoods (Boyle and Lipman, 2002). Multilevel models were developed to simultaneously consider *i* individual females (Level 1) within *j* neighbourhoods in Montreal, Toronto and Vancouver (Level 2). This model is defined as:

$$\text{logit}(\pi_{ij}) = \beta_{0j} + \beta_i x_{ij}$$
$$\beta_{0j} = \beta_0 + u_{0j} \quad (1)$$

In models with two levels of analysis, each level is associated with its own, unexplained residual error. At the individual level, the residual error is constrained to 1 in logistic regression; each successive level is associated with its own error term, which estimates the residual between-neighbourhood variation (Snijders and Bosker, 1999). This effectively means residual error is partitioned across levels in multi-level modeling. As highlighted by Boyle and Lipman (2002), the partitioning of responses across neighbourhoods is particularly important because it estimates the potential for measured and unmeasured neighbourhood variables to explain place-to-place variation in cervical cancer screening utilization. The proportion of variance accounted for by neighbourhoods can be calculated using the intra-class correlation coefficient (ICC), which is defined as

$$\rho = \sigma^2/(\sigma^2 + \pi^2/3)$$

where

$\pi^2/3=3.29$ (Snijders and Bosker, 1999).

This coefficient is the ratio between the neighbourhood level variation and the total variation (sum of the individual and neighbourhood level variation), where a decline in the ICC indicates that the differences between neighbourhoods have been reduced by the inclusion of explanatory variables (Ross et al, 2004).

Models for lifetime Pap and regular Pap were similarly developed to evaluate neighbourhood association with cervical cancer screening service utilization. In each case, a series of 5 models were developed. The first model created was the null model

with no explanatory variables; this serves to estimates the relative importance of individual and neighbourhood effects in accounting for variation in the outcome (Ross et al., 2005). From the null model, additional models were built incrementally, first controlling for age (mean centred), marital status, socio-economic variables, NDIS, health-related covariates, and CMA. Then the neighbourhood proportion of immigrants and immigrant-related variables were added to create the third model. In the fourth model, CMA variables and interactions between CMA and immigrant status were included, along with language ability. With the addition of cultural origin, the full model was created. Odds ratios and associated 95 percent confidence intervals were estimated.

3.4 Results

The total sample for analysis represented 3,474,352 females aged 18 to 69 residing in the Montreal, Toronto and Vancouver CMAs. The distribution of the sample over the three CMAs is shown in Figure 3.0. While the majority of the sample was born in Canada, 38.6 percent were immigrants. The sample contained a high percentage of immigrants, which was expected given the research focus on the three largest CMAs in Canada. These CMAs are also recognized as the country's largest immigrant receiving centres (Statistics Canada, 2005). Similar to the native-born and long-term immigrants, descriptive results in Table 3.1 indicate that recent immigrants tend to be highly educated, report good health and have consulted with a family doctor in the past twelve months. Unlike long-term immigrants and native-born Canadians, recent immigrants earn relatively less and a greater percentage cannot converse in English or French. Furthermore, recent immigrants appear to live in more disadvantaged neighbourhoods, as

compared to their native-born and longer-term counterparts. Similar to long-term immigrant women, recent immigrant women also tend to reside in neighbourhoods with a higher proportion of immigrants. Overall, 88.7 percent of native-born, 60.9 percent of recent immigrants, and 85.4 percent of long-term immigrant women reported having had a Pap test.

3.4.1 Descriptive Results of Lifetime Uptake

Table 3.2 presents additional descriptive information on characteristics of women reporting yes to ever having had a Pap test (lifetime Pap). In particular, this group of women appears to be well educated, married, completed post secondary education and are, on average, in their early 40s. The vast majority of this group also report positive self-reported health (greater than 89 percent) and having consulted with a general pracitioner within the past twelve months. Women in this group also appear to report middle-high household income adequacy, with the exception of recent immigrants, whereby the majority reports middle adequacy. In terms of language ability, approximately 97 percent can converse in English and/or French. Not surprisingly, close to 14 percent of recent immigrant women reporting a Pap test could not converse in one or both of Canada's official languages, as compared to 86 percent who can. Given that this question may capture Pap testing that occurred in countries other than Canada, it may be that these women had been tested outside of Canada.

3.4.2 Multilevel Models of Lifetime Uptake

Tables 3.3 and 3.4 display the multilevel results for lifetime Pap testing. These tables consist of a series of increasingly complex models. The dependent variable is lifetime Pap uptake. Building upon the null model, model 2 reveals that a higher level of education, higher household income adequacy, and having had contact with a general practitioner within the past year is associated with uptake. On the other hand, being single, achieving less than a high school education, reporting low household income adequacy, residing in Toronto (relative to Montreal) and living in a disadvantaged neighbourhood is negatively associated with uptake. Self-reported health-status appears insignificantly associated with uptake. As immigrant-specific covariates are considered in model 3, income adequacy covariates and neighbourhood disadvantage are reduced to non-significance.

As shown in Table 3.3 (model 3), the odds of ever having had a Pap test significantly decrease by 0.34 with every 10 percent increase in the concentration of immigrants. Also, the odds of having a Pap test are 0.16 and 0.50 for recent and long-term immigrant women, respectively, relative to Canadian born women. Similar to being single, being separated, widowed or divorced was negatively associated with uptake, relative to being married or living common-law. Furthermore, the direction of association between Toronto and uptake has reversed: relative to Montreal, women in Toronto and Vancouver are more likely to have ever had a Pap test.

To examine the extent to which CMA moderates the association between immigrant status and uptake, four cross-level interactions are added in Model 4. Relative

to non-immigrants residing in Montreal, the results indicate that recent immigrants in Toronto, along with recent and long-term immigrants in Vancouver, are less likely to have ever had a Pap test. However, a number of these effects become non-significant once cultural origin is taken into consideration in the full model (Model 5). The association between use and recent immigrants in Vancouver remains significant (at $p<0.05$). In relation to the white reference group, being Chinese, South Asian and other Asian origins decreases the likelihood of Pap testing. Cultural origin also appears to in part explain the effect of neighbourhood concentration of immigrants wherein the size of this effect was reduced from 0.33 ($p<0.001$) to 0.65 and insignificant.

Table 3.4 highlights evidence of between neighbourhood variations in the lifetime use of Pap testing. According to the null model, the amount of variation attributable to neighbourhoods was approximately 7.4 percent. Controlling for demographic, socio-economic, health-related factors and CMA residency, Model 2 explains only a small proportion of between neighbourhood variability. On the other hand, immigrant status, immigrant interactions and cultural origin appear to account for a larger proportion of this variability. For example, model 3 reveals that the concentration of immigrants at the neighbourhood level and immigrant status exhibit strong associations with the uptake and account for approximately half of the between neighbourhood differences. In the full model (model 5), the amount of variation attributable to the neighbourhood is decreased by 5.2 percentage points.

3.4.3 Descriptive Results of Regular Pap Use

Building upon lifetime uptake, the following section considers whether or not a woman had a Pap test within the past three years (regular Pap test). Table 3.5 presents the descriptive results of the women included in the analyses of regular Pap testing. Among women who have participated in Pap testing, 89 percent of native-born, 93 percent of recent immigrants, and 86 percent of long-term immigrant women reported having a similar test within the past three years. Regular use among recent immigrants appears to be consistent with that of their native-born and long-term immigrant counterparts, if not higher. This sample also appears to be well-educated, married, report middle household income adequacy and able to converse in either English or French. In addition, the vast majority reports being in positive health and had consulted with a general pracitioner within the past twelve months. Recent immigrants in this sample appear to live in more disadvantaged neighbourhoods, as compared to their native-born and longer-term counterparts. Recent and long-term immigrant women also appear to reside in neighbourhoods with a higher proportion of immigrants.

Table 3.6 shows the characteristics of those women who report having had a regular Pap test. Overall, this group is well-educated, married, reports middle household income adequacy, positive health and has consulted with a general pracitioner in the past twelve months. The vast majority of this group was also able to converse in either English and/or French, although a little less than 14 percent of recent immigrants reported not being able to converse in one or both of Canadian's official languages. On average, this group of women appeared to living in neighbourhoods with immigrants and did not

appear to be living in disadvantaged neighbourhoods. However, disaggregated results suggest that recent immigrants appeared to live in more disadvantaged neighbourhoods compared to their native-born and longer-term counterparts.

3.4.4 Multilevel Models of Regular Use

Tables 3.7 and 3.8 display the multilevel logistic regression results for regular Pap testing. The dependent variable is having had a Pap test within the past three years (regular Pap). After controlling for the null model (Table 3.7), model 2 reveals that age exhibits a strong and negative association with regular use, whereas positive health status, contact with a general pracitioner and residing in Toronto are strong and positively association with use. However, the effect of Toronto is reduced to non-significance in model 3. Nevertheless, neighbourhood disadvantage appears to be negatively associated with use. In addition to age and health covariates, neighbourhood concentration of immigrants is positively associated with regular use. The odds of having had a Pap test within the last three years increase by 2.21 with every 10 percent increase in the concentration of immigrants. Findings also reveal that individual immigrant status and language ability are not significantly associated with regular use. CMA covariates are also insignificant in model 3 and onwards[5]. The effects of culture are examined finally in model 4. Compared to the white reference group, reporting Chinese cultural origin is significantly associated with use. Model 4 also reveals that the effects of age and neighbourhood disadvantage remain negatively associated with use, whereas positive

[5] In model 3 of this particular analysis, the potential interactions between CMA and immigrant status were examined in preliminary analyses. However, they were removed from the model because of insignificance.

health, contact with a general pracitioner and neighbourhood concentration of immigrant remains positively associated with use.

Table 3.8 summarizes the variance components of the multilevel logistics regression models discussed above. According to the null model, approximately 3 percent of the variation is attributable to neighbourhoods. The variance at the neighbourhood-level decreased with the addition of individual- and neighbourhood-level covariates. After controlling for these covariates, the models are able to account for half of the neighbourhood variability; the final model was able to explain 1.5 percent of the variation between neighbourhoods. While individual characteristics explain much of the variation in neighbourhoods, neighbourhood characteristics were also determinants of utilization.

3.5 Discussion

Using a multilevel approach, this cross-sectional women's health study has focused on individual and neighbourhood level influences on the lifetime uptake and regular use of cervical cancer screening (Pap testing) services among women in the Montreal, Toronto and Vancouver CMAs. Pap testing can prevent invasive cervical cancer (Health Canada, 2002; Miller et al., 1991; Eddy, 1990; Health Canada, 2002). Yet, despite the advances in the secondary prevention of cervical cancer (Leyden et al., 2005), in 2006 more than 1,300 new cases and 390 deaths from this disease were estimated to occur in Canada (National Cancer Institute of Canada, 2006). It appears that certain subgroups may not be receiving appropriate levels of preventive care. As a result, this research has sought to investigate immigrant status as a potential predictor.

Findings reveal that dissimilarities in lifetime uptake exist between the native-born and the foreign-born populations, after controlling for age, marital status, socio-economic status, and health covariates. Building upon earlier studies (Goel, 1994; Maxwell, Bancej and Snider, 2001), this research has found that recent and long-term immigrant status is strongly and inversely associated with ever having had a Pap test. Possible explanations include lack of knowledge, lack of time, language barriers and cultural factors (Black and Zsoldos, 2003; Gupta, Kumar and Stewart, 2002; Hyman and Guruge, 2002; Newbold, 2005). Findings from this study indicate that language ability became insignificant once culture was considered in uptake. Due to data constraints, this study was not able to adequately test for lack of knowledge of the importance of Pap screening, or a lack of time to undertake screening. Gupta et al. (2002) suggests low levels of knowledge about the Pap test and a low prevalence of Pap testing behaviour is significantly correlated with a low level of formal education. In addition to education status, additional individual-level characteristics such as age, marital status and contact with a general practitioner were found to be associated with uptake and consistent with earlier Canadian studies (Bryant et al., 2002; Gupta et al., 2003; Maxwell et al., 2001; Snider et al., 1996). Utilization of primary care, measured through contact with a general practitioner, has consistently been shown to an important facilitator of timely cervical cancer screening services (Gupta et al., 2002; Maxwell et al., 2001).

In terms of factors associated with having had a Pap test within the past three years, individual immigrant status did not appear to influence regular use. However,

neighbourhood disadvantage and the neighbourhood concentration of immigrants appears to be significant predictors.

Although modest, there was significant between neighbourhood variation (7.4 percent) that suggests policies could focus on both people and places. There appears to be significant differences between neighbourhoods and CMAs in the uptake of cervical cancer screening among recent immigrant arrivals. While results indicate that the association between CMA and cervical cancer screening differs by immigrant status, these interactions lose their statistical significance after controlling for cultural origin. This may be due to differences in the cultural background of immigrants living in these urban centres. For example, Vancouver is home to many immigrants arriving from China, which might suggest that uptake due to residency and immigrant status maybe reflecting cultural differences. This may also be true at the neighbourhood level where controlling for cultural origin reduces the effect attributable to the neighbourhood concentration of immigrants to non-significance.

Findings also suggest that place is important in the use of regular Pap testing. Approximately 3 percent of variation in regular use appears to be attributable to between-neighbourhood differences. This suggests that there are discernible differences between neighbourhoods and between people within neighbourhoods (Merlo et al., 2005). In other words, there is moderate evidence to suggest that possible neighbourhood contextual phenomenon is shaping individual screening behaviour. Factors such as neighbourhood disadvantage and neighbourhood immigrant concentration have assisted in explain this variance.

These results provide new and unexpected insight into the preventive health behaviours of immigrant and native-born women. After controlling for age, socio-economic and demographic and health-related characteristics, neighbourhood disadvantage and the neighbourhood concentration of immigrant plays a significant role. Among women sampled who have had a least one Pap test, there appears to be a strong and positive association between neighbourhood concentration of immigrant association with regular Pap test use. That is, a higher neighbourhood concentration of immigrants is connected to positive routine screening behaviours among women who already participate in screening. Building upon the determinants of health literature, this research has also found that neighbourhood disadvantage is negatively correlated with cervical cancer screening service use, above and beyond individual socio-economic status.

Chinese origin was associated with having had a Pap test within the past three years. The direction of this relationship is distinctly different from those first set of analyses, which suggested that ever participating in cervical cancer screening is negatively associated with women of Asian background. Issues that closely reflect the ethnic or cultural makeup of the immigrant population, including diverse issues such as gender roles, trust of western medicine, attitudes and beliefs about reproductive health practices, may create differentials in the use of preventive health care, and ultimately health. There may be a cultural avoidance of invasive medical tests, such as Pap testing (Harlan, Berstein and Kessler, 1991), which can serve to further isolate a community (Gupta et al., 2002). Additional research is required to better understand the impact of

utilization and health-seeking behaviours associated with immigrant status versus ethnic and cultural background.

Given the limitation of this study's cross-sectional design, longitudinal information could provide insight into the temporal directions of the associations. This is necessary to better understand where or not women are continually having regular Pap test every three years. A lack of data regarding the role of women's attitudes, beliefs and knowledge regarding preventive health practices also limits this research. In addition, this study also relied upon self-reported information about Pap testing, which may be subject to recall bias. However, the CCHS was particularly valuable given the focus on immigrants; interviews were conducted in over twenty-two different languages.

The multilevel techniques employed have been useful and demonstrates the potential for future applications into preventive health care utilization and other health-seeking behaviours by immigrant status. This is the first known study to examine the influence of immigrant concentration on health or health-seeking behaviours. Clearly, broader contextual environments have the potential to influence health care utilization. Research at higher levels serves to identify types of geographical areas where public health interventions, aimed at individual risk reduction, may be best targeted (Pickett and Pearl, 2001). Community level interventions to increase the utilization of Pap testing should be taken into account. Multi-dimensional strategies may be able to reach subgroups that remain resistant to screening efforts (Harlan, Bernstein and Kessler, 1991). To conclude, findings not only highlighted the contextual difference in Pap test among recent immigrant women but also pointed to the role of cultural background of

these women in showing this variation. As discussed in the results, recent immigrant women to Canada and women of China, South Asia and other Asian backgrounds exhibited low uptake of Pap testing. However, results also suggest that among Chinese women, who have had a least one test, are likely to have had a regular test. This would be in accordance with cervical cancer screening recommendations. While this research is not able to conclude whether or not this is the result of particular targeting efforts aimed at reaching Chinese women, a growing body of research examining the facilitators to preventive screening among Chinese Canada women (see for example, Hislop et al., 2003). Qualitative research may be necessary. Overall, this research has served to stresses the likely need to promote greater information and awareness of public health services for cervical cancer screening most especially to recent immigrant women with Asian backgrounds.

3.6 References

Black, M., Zsoldos., J. 2003. Lay health educators to enhance cancer screening. summary report of focus groups: planning with women from four communities. Hamilton, Ontario, Canada: Hamilton Public Health and Community Services.

Boyle, M.H., Lipman, E.L. 2002. Do Places Matter? Socioeconomic disadvantage and behavioural problems of children in Canada. *Journal of Consulting and Clinical Psychology* 70(2):378-389.

Bryant, J., Browne, A.J., Barton, S., Zumbo, B. 2002. Access to health care: social determinants of preventive cancer screening use in north British Columbia. *Social Indicators Research* 60:243-262.

Citizenship and Immigration Canada. 2001. Facts and Figures, 2000 Immigration Overview. Ministry of Public Works and Government Services, Stategic Policy, Planning and Research.

DesMeules, M., Gold, J., Kazanjian, A., Manuel, D., et al. 2004. New approaches to immigrant health assessment. *Canadian Journal of Public Health* 95(3):I22-I26.

Diez Roux, A.V. 2001. Investigating neighborhood and area effects on health. *American Journal of Public Health* 91(11):1783-1789.

Duarte-Franco, E., Franco, E.L. 2003. Cancer of the uterine cervix. Women's Health Surveillance Report. Chapter 12. Available at: http://www.phac-aspc.gc.ca/publicat/whsr-rssf/pdf/WHSR_Chap_12_e.pdf. Accessed 05/03, 2006.

Eddy, D.M. 1990. Screening for cervical cancer. *Annals of Internal Medicine* 113(214):216.

Glazier, R.H., Creatore, M.I., Gozdyra, P., Matheson, F.I., Steele, L.S., Boyle, E., et al. 2004. Geographic methods for understanding and responding to disparities in mammography use in Toronto, Canada. *Journal of General Internal Medicine* 19:952-961.

Goel, V. 1994. Factors associated with cervical cancer screening: results from the Ontario health survey. *Canadian Journal of Public* Health 85:125-127.

Gupta, A., Kumar, A., Stewart, D.E. 2002. Cervical cancer screening among South Asian women in Canada: The role of education and acculturation. *Health Care for Women International* 23:123-34.

Harlan, L.C., Bernsein, A.B., and Kessler, L.G. 1991. Cervical cancer screening: who is not screened and why? *American Journal of Public Health* 81(7): 885-890.

Health Canada. 2002. Cervical cancer screening in Canada: 1998 surveillance report. Ministry of Public Works and Government Services, Canada. Cat. No. H39-616/1998E.

Health Canada. 2004. Progress Report on Cancer Control in Canada. Cat. No. H39-4/50-2004E-PDF(05/03):1-80.

Hyman, I. 2001. *Immigration and Health.* Health Policy Working Paper Series. Working paper 01-05. Ottawa, ON: Health Canada. Available at: http://www.hc-sc.gc.ca/sr-sr/alt_formats/iacb-dgiac/pdf/pubs/hpr-rps/wp-dt/2001-0105-immigration/2001-0105-immigration_e.pdf . Accessed: 03/22, 2006.

Hyman, I., Guruge, S. 2002. A review of theory and health promotion strategies for new immigrant women. *Canadian Journal of Public Health* 93(3):183-187.

Johnston, G.M., Boyd, C.J., MacIsaac, M.A. 2004. Community-based cultural predictors of Pap smear screening in Nova Scotia. *Canadian Journal of Public Health* 95(2):95-98.

Leduc, N., Proulx, M. 2004. Patterns of health services utilization by recent immigrants. *Journal of Immigrant Health* 6(1):15-27.

Leyden, W., Manos, M.M., Geiger, A.M., Weinmann, S., et al. 2005. Cervical cancer in women with comprehensive health care access: attributable factors in the screening process. *Journal of the National Cancer Institute,* 97(9): 675-683.

Maxwell, C.J., Bancej, C.M., Snider, J., Vik, S.A. 2001. Factors important in promoting cervical cancer screening among Canadian women: findings from the 1996-97 National Population Health Survey (NPHS). *Canadian Journal of Public Health* 92(2):127-133.

McDonald, J.T., Kennedy, S. 2005. Ethnicity, immigration and cancer screening: evidence from Canadian women. Social and Economic Dimensions of an Aging Population, Working Paper Series, McMaster University 145.

Merlo, J., Chaix, B., Yang, M., Lynch, J., Rastam, L. 2005. A brief conceptual tutorial of multilevel analysis in social epidemiology: linking the statistical concept of clustering to the idea of contextual phenomenon. *Journal of Epidemiology and Community Health* 59:443-449.

Miller, A.B., Andersen, G., Brisson, J. Laidlaw, K., Le Pitre, N., Malcolmson, P. et al. 1991. Report of a national workshop on screening for cancer of the cervix. *Canadian Medical Association Journal* 145:1301-1325.

Morrison, B.J. 1994. Screening for cervical cancer. Canadian Task Force on the Periodic Health Care Examination, Canadian Guide to Clinical Preventive Health Care Ottawa: Health Canada: 870-881.

National Cancer Institute of Canada. 2006. Canadian Cancer Statistics 2006. Toronto, Ontario.

National Cancer Institute of Canada. 2007. Canadian Cancer Statistics 2007. Toronto, Ontario.

Newbold, K.B. 2005. Health status and health care of immigrants in Canada: a longitudinal analysis. *Journal of Health Services Research and Policy* 10(2):77-83.

Parboosingh, E.J., Anderson, G., Clarke, E.A., Inhaber, S., Kaegi, E., Mills, C., et al. 1997. Cervical cancer screening: are the 1989 recommendations still valid? *Canadian Medical Association Journal*:1847-1853.

Pickett, K.E., Pearl, M. 2001. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *Journal of Epidemiology and Community Health* 55:111-122.

Ross, N.A., Dorling, D., Dunn, J.R., Henriksson, G., Glover, J., Lynch, J., et al. 2005. Metropolitan income inequality and working-age mortality: a cross-sectional analysis using comparable data from five countries. *Journal of Urban Health* 82(1):101-110.

Ross, N.A., Tremblay, S.S., Graham, K. 2004. Neighbourhood influences on health in Montreal, Canada. *Social Science and Medicine* 59(7):1485-1494.

Statistics Canada. 2005. Proportion of the Foreign-born Population, 1991-2001 Census. Available at: http://www40.statcan.ca/101/cst01/demo47a.htm?sdi=foreign%20born. Accessed 03/21, 2006.

Snider, J., Beauvais, J., Levy, I., Villeneuve, P., Pennock, J. *Trends in mammography and pap smear utilization in Canada.* Chron Dis Can 1996;17:108-17.

Snijders, T., Bosker, R. 1999. Multilevel analysis: an introduction to basic and advanced multilevel modeling. London: SAGE Publications.

Yi, J.K. 1994. Factors associated with cervical cancer screening behaviour among Vietnamese women. *Journal of Community Health* 19(3):95-98.

Figure 3.0 Total Selected Sample by CMA (%), weighted

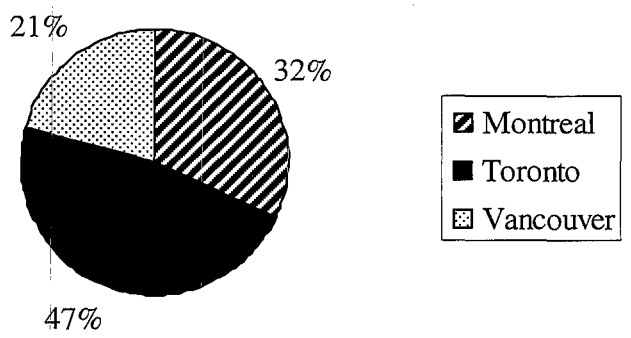

Table 3.1 Descriptive characteristics (%) of sample, Lifetime Pap uptake, weighted

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Sample	100	61.4	14.5	24.1
Have you ever had a Pap test				
No	16.1	11.4	39.1	14.6
Yes	83.9	88.7	60.9	85.4
Age (Mean)	41	40	35	47
Marital Status				
Married, Common-law	61.7	56.9	68.5	69.6
Separated, Divorced, Widowed	12.7	12.4	8.3	16.2
Single	25.6	30.7	23.2	14.2
Educational Attainment				
Less than High School	13	11	13.3	18
High School Graduate	27.3	28.3	25.8	25.3
Post Secondary Graduate	59.7	60.6	60.9	56.8
Household Income Adequacy				
Low	9.7	6.9	24.7	8.8
Middle	50.6	47.1	60.4	54.3
High	39.7	46	15	36.9
Self-Reported General Health				
Negative (Fair, Poor)	10.7	8.7	10.1	16.1
Positive (Excellent, Very Good, Good)	89.3	91.3	89.9	83.9
Consultation with GP/family doctor				
No	17.8	18.6	19.4	15.1
Yes	82.2	81.4	80.6	84.9
Can Converse in English and/or French				
Yes	96	99.7	85	93.3
No	4	0.3	15	6.7
Cultural/Racial Origin				
White	70.3	91.2	21.5	46.3
Black	4	1.3	6.7	9.3
Other Asian	0.9	0.3	3.1	0.9
Filipino	2.2	0.5	5.2	4.7
Chinese	8.7	1.9	26.3	15.2
South Asian	5.1	0.8	16.3	9.4
South East Asian	1.2	0.4	2.7	2.3
Latin American	2	0.2	6	4.2
Other	5.7	3.4	12.3	7.8
Neighbourhood Proportion of Immigrants (Mean)	0.35	0.28	0.5	0.44
Neighbourhood Disadvantage Index Score (Mean)	0.06	-0.04	0.47	0.08
N (weighted)	3,474,352	2,134,383	502,138	837,842

Table 3.2 Descriptive characteristics (%) of sample reporting Yes, Lifetime Pap uptake, weighted

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Have you ever had a Pap test				
Yes	100	64.9	10.5	24.6
Age (Mean)	43	41	37	48
Marital Status				
Married, Common-law	65.6	61.2	77.8	72.2
Separated, Divorced, Widowed	13.6	13.2	10.6	15.9
Single	20.8	25.7	11.6	11.9
Educational Attainment				
Less than High School	11.8	10.4	10.2	16.2
High School Graduate	26	26.9	21.8	25.3
Post Secondary Graduate	62.3	62.7	68	58.5
Household Income Adequacy				
Low	8.2	6.5	20.4	7.8
Middle	49.9	46.4	61.9	54.5
High	41.9	47.1	17.7	37.7
Self-Reported General Health				
Negative (Fair, Poor)	10.6	8.7	11.1	15.6
Positive (Excellent, Very Good, Good)	89.4	91.3	88.9	84.4
Consultation with GP/family doctor				
No	16	16.7	15.9	14.1
Yes	84	83.3	84.1	85.9
Can Converse in English and/or French				
Yes	97	99.8	86.1	94.2
No	3	0.2	13.9	5.8
Cultural/Racial Origin				
White	75.4	92.7	28.7	49.7
Black	3.8	1.3	7.3	9.1
Other Asian	0.7	0.3	2.7	0.8
Filipino	1.8	0.2	5.3	4.7
Chinese	6.5	1.3	22.6	13.3
South Asian	3.8	0.5	13.6	8.2
South East Asian	0.7	0.3	1.4	1.5
Latin American	2.1	0.2	7.1	4.7
Other	5.3	3.3	11.4	8
Neighbourhood Proportion of Immigrants (Mean)	0.34	0.27	0.49	0.43
Neighbourhood Disadvantage Index Score (Mean)	-0.01	-0.08	0.38	0.02
N (weighted)	2,913,728	1,892,213	305,723	715,793

Table 3.3 Multilevel logistic regression models: Lifetime Pap test uptake

Fixed Effects	**Null Model**	**Model 2**			**Model 3**			**Model 4**			**Model 5**		
	β (se)	**β (se)**			**β (se)**			**β (se)**			**β (se)**		
Intercept	1.87‡ (0.04)	1.50‡ (0.15)			2.02‡ (0.16)			1.96‡ (0.17)			1.417‡ (0.1		
			95% CI			**95% CI**			**95% CI**			**95% CI**	
		OR	**Lower**	**Upper**	**OR**	**Lower**	**Upper**	**OR**	**Lower**	**Upper**	**OR**	**Lower**	**Upper**
Age Centred		1.04 ‡	1.03	1.04	1.04 ‡	1.03	1.05	1.03 ‡	1.03	1.04	1.03 ‡	1.02	1.04
Education (ref=High School Graduate)													
Less than High School		0.53 ‡	0.66	0.43	0.51 ‡	0.41	0.64	0.54 ‡	0.43	0.67	0.52 ‡	0.42	0.65
Post Secondary Graduate		1.56 ‡	1.33	1.82	1.80 ‡	1.53	2.12	1.75 ‡	1.49	2.06	1.79 ‡	1.52	2.12
Income Adequacy (ref=middle)													
Low		0.74 †	0.60	0.91	0.89	0.72	1.11	0.91	0.73	1.13	0.94	0.75	1.17
High		1.57 ‡	1.32	1.87	1.18	0.98	1.42	1.18	0.98	1.42	1.16	0.96	1.39
Marital Status (ref=Married/Common-law)													
Separated, Widowed, Divorced		0.89	0.71	1.10	0.70 †	0.56	0.88	0.69 †	0.55	0.86	0.62 ‡	0.49	0.79
Single		0.48 ‡	0.41	0.57	0.31 ‡	0.25	0.37	0.30 ‡	0.25	0.36	0.28 ‡	0.23	0.33
Neighbourhood Disadvantage Index Score		0.86 ‡	0.80	0.92	1.04	0.95	1.13	1.05	0.96	1.14	1.02	0.93	1.11
Self-Reported Health (ref=negative)													
Positive		1.20	0.96	1.49	1.18	0.94	1.48	1.17 ‡	0.94	1.47	1.13	0.89	1.42
Consultation with GP/family doctor (ref=no)													
Yes		1.95 ‡	1.65	2.29	1.91 ‡	1.62	2.26	1.93 ‡	1.63	2.28	1.90 ‡	1.60	2.25
CMA (ref=Montreal)													
Toronto		0.81 *	0.67	0.97	1.79 ‡	1.40	2.30	1.93 ‡	1.45	2.56	1.75	1.32	2.34
Vancouver		0.89	0.73	1.08	1.73 ‡	1.36	2.19	2.55 ‡	1.90	3.44	2.67 ‡	1.97	3.62
Neighbourhood Proportion of Immigrant					0.34 ‡	0.20	0.61	0.33 ‡	0.19	0.58	0.65	0.36	1.15
Immigrant Status (ref=Native-born)													
Recent Immigrant (0-10 Years in Canada)					0.16 ‡	0.13	0.20	0.34 ‡	0.22	0.52	0.37 ‡	0.24	0.59
Long-term Immigrant (11+ Years in Canada)					0.50 ‡	0.41	0.61	0.60 *	0.40	0.90	0.67 ‡	0.43	1.02
Cross-level interactions (ref=Montreal Native-born)													
Toronto*Recent Immigrant Status								0.57 *	0.34	0.93	0.80	0.48	1.34
Toronto*Long-term Immigrant Status								0.92	0.57	1.49	1.14	0.69	1.87
Vancouver*Recent Immigrant Status								0.32 ‡	0.19	0.54	0.51 *	0.30	0.89
Vancouver*Long-term Immigrant Status								0.58	0.34	0.98	0.88	0.50	1.52
Can Converse in English and/or French (ref=yes)													
No, neither English nor French								0.53 ‡	0.42	0.67	0.72	0.51	1.00
Cultural/Racial Origin (ref=White only)													
Black											1.36	0.89	2.08
Other Asian											0.46 *	0.25	0.83
Filipino											0.48 †	0.30	0.77
Chinese											0.25 ‡	0.19	0.33
South Asian											0.27 ‡	0.20	0.38
South East Asian											0.24 ‡	0.14	0.42
Latin American											1.63	0.86	3.11
Other											1.55 ‡	1.14	2.12

* $p<0.05$, † $p<0.01$, ‡ $p<0.001$, OR Odds Ratio, 95% CI Confidence Interval

Table 3.4 Summary of variance (standard error) components, multilevel logistic regression: Lifetime Pap uptake

Random Effects	**Null Model**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Level 2, Neighbourhood	0.261(0.06)	0.231(0.07)	0.125(0.06)	0.096(0.06)	0.067(0.06)
Level 1, Individual	1.00	1.00	1.00	1.00	1.00
Intra-class correlation coefficient (%)	7.35	6.56	3.66	2.84	2.00

Table 3.5 Descriptive characteristics (%) of sample, Regular Pap use, weighted

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Sample	100	65.1	10.4	24.5
Have you had a Pap test within the past three years				
No	11.3	11	6.8	13.9
Yes	88.7	89	93.2	86.1
Age (Mean)	43	41	37	48
Marital Status				
Married, Common-law	65.6	61.2	77.6	72.1
Separated, Divorced, Widowed	13.6	13.2	10.7	16
Single	20.8	25.6	11.7	11.9
Educational Attainment				
Less than High School	11.7	10.4	10.3	15.8
High School Graduate	26	27	21.5	25.4
Post Secondary Graduate	62.3	62.6	68.2	58.8
Household Income Adequacy				
Low	8.2	6.5	20.6	7.7
Middle	49.9	46.4	61.8	54.5
High	42	47.2	17.6	37.8
Self-Reported General Health				
Negative (Fair, Poor)	10.5	8.6	11.2	15.2
Positive (Excellent, Very Good, Good)	89.5	91.4	88.8	84.8
Consultation with GP/family doctor				
No	16	16.7	15.9	14.2
Yes	84	83.3	84.1	85.8
Can Converse in English and/or French				
No	2.9	0.2	14.1	5.4
Yes	97.1	99.8	85.9	94.6
Cultural/Racial Origin				
White	75.4	92.7	28.8	49.5
Black	3.8	1.3	7.1	9.1
Other Asian	0.7	0.3	2.7	0.8
Filipino	1.8	0.2	5.1	4.8
Chinese	6.5	1.3	22.7	13.4
South Asian	3.8	0.5	13.5	8.2
South East Asian	0.7	0.3	1.4	1.5
Latin American	2.1	0.2	7.2	4.7
Other	5.3	3.3	11.4	8
Neighbourhood Proportion of Immigrants (Mean)	0.34	0.27	0.49	0.43
Neighbourhood Disadvantage Index Score (Mean)	0.03	-0.04	0.42	0.06
N (weighted)	2,900,626	1,886,794	302,603	711,229

Table 3.6 Descriptive characteristics (%) of sample reporting yes, Regular Pap use, weighted

Variables	Total Sample	Native-born	Recent Immigrant	Long-term Immigrant
Have you had a Pap test within the past three years				
Yes	100	65.2	11	23.8
Age (Mean)	42	40	37	47
Marital Status				
Married, Common-law	65.6	61	77.8	72.4
Separated, Divorced, Widowed	12.6	12	10.4	15.1
Single	21.9	27	11.8	12.6
Educational Attainment				
Less than High School	10.4	8.8	10.4	14.9
High School Graduate	25.9	27.5	20.7	24.1
Post Secondary Graduate	63.7	65.5	68.9	61
Household Income Adequacy				
Low	7.6	6	20.3	6.6
Middle	48.9	45	61.8	54
High	43.5	49	18	39.4
Self-Reported General Health				
Negative (Fair, Poor)	9.5	7.5	10.6	14.5
Positive (Excellent, Very Good, Good)	90.5	92.5	89.4	85.5
Consultation with GP/family doctor				
No	14.5	15	15.4	12.8
Yes	85.5	85	84.6	87.2
Can Converse in English and/or French				
No	2.8	0.2	13.5	5
Yes	97.2	99.8	86.5	95
Cultural/Racial Origin				
White	74.9	92.2	28.2	48.9
Black	4	1.3	7.4	9.6
Other Asian	0.6	0.3	2.2	0.7
Filipino	1.8	0.2	4.9	4.6
Chinese	6.8	1.4	23.4	14.1
South Asian	3.7	0.6	12.9	8
South East Asian	0.7	0.2	1.3	1.5
Latin American	2.2	0.3	7.7	5
Other	5.5	3.6	12.1	7.8
Neighbourhood Proportion of Immigrants (Mean)	0.34	0.28	0.49	0.44
Neighbourhood Disadvantage Index Score (Mean)	0.01	-0.07	0.45	0.04
N (weighted)	2,573,119	1,678,748	281,898	612,473

Table 3.7 Multilevel logistic regression models: Regular Pap test use

Fixed Effects	**Null Model**	**Model 2**			**Model 3**			**Model 4**		
	β (se)	**β (se)**			**β (se)**			**β (se)**		
Intercept	1.99‡ (0.04)	0.79‡ (0.15)			0.70‡ (0.16)			0.69‡ (0.16)		
			95% CI			**95% CI**			**95% CI**	
		OR	**Lower**	**Upper**	**OR**	**Lower**	**Upper**	**OR**	**Lower**	**Upper**
Age Centred		0.94 ‡	0.94	0.95	0.94 ‡	0.94	0.95	0.94 ‡	0.94	0.95
Education (ref=High School Graduate)										
Less than High School		0.94	0.74	1.19	0.95	0.75	1.20	0.95	0.75	1.21
Post Secondary Graduate		1.09	0.92	1.30	1.07	0.90	1.28	1.08	0.91	1.29
Income Adequacy (ref=middle)										
Low		0.92	0.71	1.19	0.92	0.71	1.19	0.90	0.70	1.17
High		1.17	0.97	1.40	1.18	0.98	1.42	1.18	0.98	1.42
Marital Status (ref=Married/Common-law)										
Separated, Widowed, Divorced		0.90	0.75	1.08	0.91	0.75	1.09	0.90	0.75	1.09
Single		0.88	0.71	1.10	0.87	0.70	1.09	0.86	0.69	1.08
Neighbourhood Disadvantage Index Score		0.92	0.85	1.00	0.87 †	0.79	0.95	0.87 †	0.80	0.96
Self-Reported Health (ref=negative)										
Positive		1.72 ‡	1.40	2.11	1.73 ‡	1.41	2.13	1.75 ‡	1.42	2.15
Consultation with GP/family doctor (ref=no)										
Yes		2.70 ‡	2.25	3.23	1.10 ‡	0.92	1.32	2.67 ‡	2.23	3.20
CMA (ref=Montreal)										
Toronto		1.11 *	0.93	1.34	0.87	0.68	1.11	0.88	0.69	1.13
Vancouver		1.15	0.94	1.40	0.94	0.74	1.19	0.94	0.74	1.19
Neighbourhood Proportion of Immigrant					2.21 †	1.23	3.97	2.11 *	1.17	3.82
Immigrant Status (ref=Native-born)										
Recent Immigrant (0-10 Years in Canada)					1.12	0.77	1.62	1.09	0.74	1.63
Long-term Immigrant (11+ Years in Canada)					1.00	0.83	1.21	0.98	0.79	1.20
Can Converse in English and/or French (ref=yes)										
No, neither English nor French					1.09	0.67	1.79	0.97	0.58	1.62
Cultural/Racial Origin (ref=White only)										
Black								1.33	0.78	2.27
Other Asian								0.70	0.35	1.41
Filipino								0.75	0.41	1.37
Chinese								1.57 *	1.01	2.44
South Asian								0.72	0.45	1.15
South East Asian								0.61	0.24	1.56
Latin American								1.42	0.59	3.40
Other								1.15	0.77	1.74

* $p<0.05$, † $p<0.01$, ‡ $p<0.001$, OR Odds Ratio, 95% CI Confidence Interval

Table 3.8 Summary of variance (standard error) components, multilevel logistic regression: Regular Pap Use

Random Effects	**Null Model**	**Model 2**	**Model 3**	**Model 4**
Level 2, Neighbourhood	0.103(0.06)	0.06(0.07)	0.053(0.07)	0.050(0.06)
Level 1, Individual	1.00	1.00	1.00	1.00
Intra-class correlation coefficient (%)	3.04	1.79	1.59	1.50

CHAPTER FOUR: Conclusion

4.1 Introduction

This thesis presents the results of two major analyses of CCHS data, combined with the Canadian Census, comparing the health care utilization of immigrant women to that of native-born Canadians. The main purpose has been to examine the use of particular health care services among immigrant women in Canada. This research set out to achieve the following objectives:

- To investigate evidence of disparities in the use of primary health care services (general practitioner), between immigrant and native-born women;
- To explore the factors that determines uptake of preventive cervical cancer screening services (lifetime Pap testing) among immigrant women, as compared to the native-born population.
- To explore the factors that determines compliance with regular cervical cancer screening services guidelines in Canada (regular Pap testing) among immigrant women, as compared to the native-born population.

These objectives were met by conducting descriptive and multilevel regression analyses of the 2003 CCHS masterfile and the 2001 Canadian Census public use micro-data file. This concluding chapter provides a summary of the results and describes the overall contributions of this research. The final sections of this chapter offer suggestions for future research.

4.2 Summary of Major Findings

Through descriptive and multilevel logistic regression analyses, the utilization of primary and preventive health care services among immigrant and native-born women residing in urban Canada were examined in several ways: (a) consultation with a general practitioner (at least once in the past year vs. not); (b) pap (smear) testing in terms of lifetime uptake (ever vs. never); and (c) regular use of Pap (smear) testing (within the past three years or more than three years ago) in accordance with the Canadian Task Force on Preventive Health Care guidelines (Morrison, 1994). Together these analyses provide unique insight into the complex predictors of health care use, with a special focus on immigrant status.

Starting with the investigation of primary health care service use, Chapter 2 found that individual-, neighbourhood- and CMA-level characteristics influence the utilization of primary health care (GP utilization) . Key covariates were drawn from Andersen's behavioural model of health care utilization. In addition to age, this research found that health status, education, income adequacy and cultural origin modified the association between utilization (stronger associations at higher levels), and neighbourhood level variables exerted a significant influence on utilization. Neighbourhood disadvantage was negatively associated, while the neighbourhood concentration of immigrants was positively associated with having consulted with a GP within the past year.

Most notably, these findings revealed significant neighbourhood differences, suggesting that important associations between contextual factors and utilization remain,

even after controlling for individual-level factors. The between-neighbourhood variation was accounted for partially by the socioeconomic and demographic characteristics of the women in the study, even after controlling for age and health status. Self-reported cultural origin also accounted for this variation. Based on these results, we conclude that neighbourhoods appear to play an important role above and beyond individual characteristics.

Focusing on a preventive health care, a service usually administered by a general practitioner or family doctor, Chapter 3 examines the utilization of cervical cancer screening. Specifically, it focused on individual and neighbourhood level influences on the lifetime uptake and regular use of cervical cancer screening services (Pap testing) among women in the Montreal, Toronto and Vancouver CMAs. Findings reveal that dissimilarities in lifetime uptake exist between the native-born and the foreign-born populations, after controlling for age, marital status, socio-economic status, and health covariates. In addition to education status, additional individual-level characteristics such as age, marital status and contact to a GP were associated with uptake and consistent with earlier Canadian studies (Bryant et al., 2002; Gupta et al., 2003; Maxwell et al., 2001; Snider et al., 1996).

In terms of factors associated with having had a Pap test within the past three years, individual immigrant status did not appear to influence use. However, neighbourhood disadvantage and the neighbourhood concentration of immigrants are significant predictors. Although modest, there was significant between-neighbourhood variation in the lifetime uptake and regular utilization of Pap testing.

4.3 Limitations

Given the limitation of this study's cross-sectional design, longitudinal information could provide insight into the temporal directions of the associations. For example, longitudinal data is necessary to better understand whether or not women are continually having regular Pap test every three years. Furthermore, a lack of data regarding the role of women's attitudes, beliefs and knowledge regarding primary and preventive health practices also limits this research. This type of information could help researchers better understand health behaviours, including motivations. Qualitative research methodologies could be particularly valuable. Finally, this study also relied upon self-report information about GP use and Pap testing. It is important to recognize that these self-reported variables may have been subject to recall bias. Nevertheless, the CCHS was particularly valuable given the focus on immigrants; interviews were conducted in over twenty-two different languages.

4.4 Policy Implications and Research Contributions

This multilevel secondary data analysis project has examined a growing concern within the public health care sector of the inequities in health care use amongst immigrants. Findings are able to contribute information to aid in the design of effective public health policies through the identification of who may have less contact with a general practitioner and who under-uses cervical cancer screening services. This research can assist in the identification of how programs can be better tailored to meet the specific needs of a variety of different groups of women by understanding the role of immigrant

status, neighbourhood disadvantage, and cultural characteristics that significantly influence health care use.

Findings from this research underline key neighbourhood characteristics that can be used to better understand at-risk groups and uncover inequities in order to increase the utilization of preventive care for all immigrant women that settle in the Toronto, Vancouver and Montreal CMAs. Coupled with the growth of medium-sized cities and an expanding immigrant population, these results may also be important to other area across Canada. This research can be used to mobilize for action in particular neighbourhoods and serve as a resource to community-based initiatives and government policy-makers.

Adding to the growing body of scholarly work regarding immigrants and health services research, this thesis has identified important variables associated with the utilization of primary and preventive health care. Studies involving immigrants to Canada are increasingly recognizing the importance of heterogeneities within this group. In addition to key age, health-related characteristics and socioeconomic characteristics of the individual, several immigrant-related characteristics were analyzed and proved to be significant. This research has also found that among the woman sampled, one's ability to converse in either English and/or French was not a significant predictor of health care use.

Studying broader neighbourhood influence, in addition to individual ones, is of interested because of its ability to potential to influence broader groups of people; for example, effective interventions at the community level could benefit larger number of women more effectively than intervening one woman at a time (Boyle et al., 2007). This

research is the first known study to examine the influence of immigrant concentration on health or health-seeking behaviours. To date, many existing multilevel studies have focused on neighbourhood influences of health status within the general population. As demonstrated by a qualitative research in this area (see for example, Wellstood, Wilson and Eyles, 2006), broader contextual environments have the potential to influence health care utilization.

The multilevel techniques considered in this research have demonstrated the potential for future applications into preventive health care utilization and other health-seeking behaviours by immigrant status. Drawing upon census tract profile information and the use of these advanced statistical techniques, this research was able to simultaneously examine individual level and neighbourhood (aggregate) level data. Moreover, this type of research, examining multiple individual characteristics and contextual 'exposures' concurrently, supports the adoption of a more comprehensive perspective on the determinants of health when planning future policy interventions (Litaker et al., 2005).

4.5 Conclusions and Future Research

Identifying the forces that shape health trajectories following immigration is critical to understanding immigrant's use of health care services (Jasso et al., 2004). While the health status of immigrants has been widely studied, it has been previously recognized that research on immigrants' utilization of health care services has yielded inconclusive results (Anson, 2001). Therefore, this thesis has aimed to highlight the use

of health care among recent immigrants. Until recently, this type of research has been largely understudied in the literature.

Disparities in health care use can ultimately impact immigrant health. Improving access to health care services is one means through which population health can be improved (Bryant et al., 2002) Several researchers address these issues surrounding health care utilization, given under use and potential unmet needs (see for example, Newbold, 2005; Laroche, 2000; Remennick, 1999; Woloshin et al., 1999; Wu and Schimmele, 2005). In this research, the relationship between health status, duration of residence, and health care use has been investigated. As suggested by Remennick (1999), problems using health care are shaped by the very nature of the immigration experience and immigrants' often marginal status in their host country, with the resulting limited accesses to health services, and social and cultural barriers to their utilization. Attempts to understand disparities in primary and preventive health care use have revealed multiple barriers to equitable health care use, which may be subject to country of origin, culture, socioeconomic status, and immigrant status. For example, there are some differences with respect to cultural background, although few studies have investigated this aspect. This research highlights the importance of culture in significantly influences health care use in certain respects (Wu and Schimmele, 2005). Immigrants in Canada constitute a diverse population (Fowler, 1998), meaning additional research is required to better understand the impact of uptake and health-seeking behaviours associated with immigrant status versus ethnic and cultural background.

4.6 References

Anson, O. 2001. Inequality in the access to preventive health care: the case of immigrants in Belgium. *Social Science and Medicine,* 59: 265- 279.

Boyle, M.H., Geogriades, K., Racine, Y., Mustard, C. 2007. Neighbourhood and family influences on educational attainment: results from the Ontario Child Health Survey follow-up 2001. *Child Development* 78(1):168-189.

Bryant, J., Browne, A.J., Barton, S., Zumbo, B. 2002. Access to health care: social determinants of preventive cancer screening use in north British Columbia. *Social Indicators Research* 60:243-262.

Fowler, N. 1998. Providing primary health care to immigrants and refugees: the North Hamilton experience. *Canadian Medical Association Journal,* 159(4): 388-391.

Gupta, A., Kumar, A., Stewart, D.E. 2002. Cervical cancer screening among South Asian women in Canada: The role of education and acculturation. *Health Care for Women International* 23:123-34.

Jasso, G., Massey, D.S., Rosenzweig, M.R., Smith, J.P. 2004. *Immigrant Health: Selectivity and Acculturation.* Institute for Fiscal Studies, Working Paper Series 04/23. (Accessed on 15 November 2005, URL: http://www.ifs.org.yk/wps/wp0423.pdf).

Laroche, M. 2000. Health status and health services utilization of Canada's immigrant and non-immigrant populations. *Canadian Public Policy*, 24(1): 51-75.

Litaker, D., Koroukian, S.M., and Love, T.E. (2005). Context and healthcare access: looking beyond the individual. *Medical Care*, 43(6): 531-540.

Maxwell, C.J., Bancej, C.M., Snider, J., Vik, S.A. 2001. Factors important in promoting cervical cancer screening among Canadian women: findings from the 1996-97 National Population Health Survey (NPHS). *Canadian Journal of Public Health* 92(2):127-133.

Morrison, B.J. 1994. Screening for cervical cancer. Canadian Task Force on the Periodic Health Care Examination, Canadian Guide to Clinical Preventive Health Care. Ottawa: Health Canada: 870-881.

Newbold, KB. 2005. Health status and health care of immigrants in Canada: a longitudinal analysis. *Journal of Health Services Research and Policy*, 10(2): 77-83.

Newbold, K.B., and Danforth, J. 2003. Health Status and Canada's immigrant population. *Social Science and Medicine, 57,* 1981-1995.

Remennick, L.I. 1999. Preventive behavior among recent immigrants: Russian-speaking women and cancer screening in Israel. *Social Science and Medicine,* 48:1669-1684.

Snider, J., Beauvais, J., Levy, I., Villeneuve, P., Pennock, J. *Trends in mammography and pap smear utilization in Canada.* Chron Dis Can 1996;17:108-17.

Wellstood, K., Wilson, K. and J. Eyles. 2006. 'Reasonable access' to primary care: assessing the role of individual and system characteristics. *Health and Place* 12: 121-130.

Woloshin,S., Schwartz, L.M., Katz, S.J., and Welch, G. 1997. Is language a barrier to the use of preventive services? *Journal of General Internal Medicine,* 12(8): 472-477.

Wu, Z., Penning, MJ., and Schimmele, CM. 2005. Immigrant status and unmet health care needs. *Canadian Journal of Public Health,* 96(5): 369- 373.

APPENDIX I

List of independent variables used for the analyses of Pap test utilization

Variable	**Description**	**Coding**
Age	Age in Years	(Mean centred)
Marital Status		
	Married, Common-law	Reference category
	Separated, Divorced, Widowed	Dummy Indicator (1 = yes, 0 = no)
	Single	Dummy Indicator (1 = yes, 0 = no)
Educational Attainment		
	Less than High School	Dummy Indicator (1 = yes, 0 = no)
	High School Graduate	Reference category
	Post Secondary Graduate	Dummy Indicator (1 = yes, 0 = no)
Household Income Adequacy		*(Based on household income and size)*
	Low	Dummy Indicator (1 = yes, 0 = no)
	Middle (Lower Middle, Upper Middle)	Reference category
	High	Dummy Indicator (1 = yes, 0 = no)
Neighbourhood Disadvantage Index Score (Mean)		(See additional description in text)
	Proportion of the total neighbourhood income coming from government transfer payments	
	Proportion of the neighbourhood 15 years and older without a secondary school diploma	
	Mean household income, reverse coded	
	Proportion of families in the neighbourhood with household incomes below the poverty line	
	Proportion of individuals in the neighbourhood 15 years and older who were unemployed	
Self-Reported General Health		
	Negative (Fair, Poor)	Reference category
	Positive (Excellent, Very Good, Good)	Dummy Indicator (1 = yes, 0 = no)
Had a least one consultation with a general practitioner in the past year		
	No	Reference category
	Yes	Dummy Indicator (1 = yes, 0 = no)
Census Metropolitan Area (CMA)		
	Toronto	Reference category
	Montreal	Dummy Indicator (1 = yes, 0 = no)
	Vancouver	Dummy Indicator (1 = yes, 0 = no)
Neighbourhood Proportion of Immigrants		(See description in text)

Immigrant Status		
	Native-born (non-immigrant)	Reference category
	Recent Immigrant (resident for ≤ 15 years)	Dummy Indicator (1 = yes, 0 = no)
	Long-term Immigrant (resident > 15 years)	Dummy Indicator (1 = yes, 0 = no)
Can Converse in English and/or French		
	Yes	Reference category
	No	Dummy Indicator (1 = yes, 0 = no)
Cultural Origin		
	White	Reference category
	Black	Dummy Indicator (1 = yes, 0 = no)
	Chinese	Dummy Indicator (1 = yes, 0 = no)
	South Asian (East Indian, Pakistani, Sri Lankan)	Dummy Indicator (1 = yes, 0 = no)
	Other Asian (Filipino, Japanese, Korean, Laotian Cambodian, Indonesian, Vietnamese)	Dummy Indicator (1 = yes, 0 = no)
	All Others (Arab, Afghan, Iranian, multiple races, native, self-reported other)	Dummy Indicator (1 = yes, 0 = no)