10-29-2018 1:30 PM

Oral health, dental insurance coverage, and preventive dental care utilization: The case of immigrants in Canada

Yujiro Sano
The University of Western Ontario

Supervisor
Abada, Teresa
The University of Western Ontario

Graduate Program in Sociology
A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy

Abstract

Oral health is essential for social, economic, and psychological well-being. Yet, we know very little about oral health among adult immigrants in Canada. Framing oral health as determined by a wide range of social, economic, cultural, and political conditions, three integrated articles in this dissertation aim to understand how some adult immigrants potentially experience disadvantages in accessing optimal oral health, dental insurance coverage, and preventive dental care utilization, due to their vulnerable positions in Canada.

Using the Canadian Community Health Survey (CCHS), the first article examines whether the 'healthy immigrant effect' extends to self-rated oral health in Ontario, Canada. Findings reveal that recent immigrants (living in Canada for less than 10 years) have a similar level of oral health to the native-born, although established immigrants (living in Canada for 10 years or more) have worse oral health than the native-born. Moreover, it is noteworthy that recent immigrants have better oral health once structural factors are adjusted for, potentially implying that the role of selective migration is important for understanding immigrants' oral health in Canada.

The second article also uses the CCHS to compare three types of dental insurance coverage (e.g., government-assisted, privately purchased, and employer-based insurance) among recent immigrants, established immigrants, and the native-born in Ontario. Findings from multinomial logistic regression indicate that recent and established immigrants are generally less likely to have government-assisted, privately purchased, and employer-based dental insurance than their native-born counterparts. Importantly, these differences are only partly explained by economic factors such as household income adequacy scale and employment status.

The third article uses the Longitudinal Survey of Immigrants to Canada to unpack the heterogeneity of newly arrived immigrants in the context of preventive dental care utilization. Specifically, the relationship between preventive dental care utilization and immigrant source region is examined. Findings from logistic regression analysis show

that recently arrived immigrants from West/East Africa, North Africa, Central Asia/Middle East, East Asia, and South Asia are all less likely to use preventive dental care than those from West/North Europe. The analysis further reveals that such disparities are largely attenuated when three types of enabling factors (e.g., social, cultural, and economic factors) are adjusted for.

Based on these findings, there are several implications for policymakers. Canada's universal healthcare system excludes dental care, and this disproportionally affects vulnerable groups such as immigrants. It is important to establish universal dental insurance to remove financial barriers to dental care utilization among immigrants, especially those from non-European regions. If dental care is to remain privately financed, however, it is then important to establish intervention programs targeting this population. Policymakers should also pay attention to social and cultural vulnerabilities of some immigrants, including lack of beneficial social network, language proficiency, and biomedical understanding of dentistry. It is also critical to put efforts in reducing economic and social inequalities between immigrants and the native-born.

Keywords: Oral health; Dental insurance; Preventive dental care; Immigrants; Ontario; Canada; Healthy immigrant effect

Co-Authorship Statement

This thesis is made up of a collection of papers. While these papers were co-authored with my supervisor, as the first author, I conducted the majority of research. The research manuscripts are as follows:

Chapter 2: Sano, Y., & Abada, T. Immigration as a social determinant of oral health: Does the 'healthy immigrant effect' extend to self-rated oral health in Ontario, Canada?

Chapter 3: Sano, Y., & Abada, T. Unequal dental insurance coverage between immigrants and the native-born in Ontario, Canada.

Chapter 4: Sano, Y., & Abada, T. The relationship between preventive dental care utilization and immigrant source region among immigrants newly arrived in Canada: Modifying Andersen's behavioural model of health care utilization.

Acknowledgments

First and foremost, I would like to express my deepest appreciation to my supervisor, Professor Teresa Abada. She has been the cornerstone for the timely completion of this dissertation. In our numerous conversations, she has shown deep interest not only in my budding career as a researcher, but also in my personal development as a whole. Going through a seemingly endless number of revisions in the completion of this dissertation, she always provided me invaluable edits and comments in a very timely manner. I must thank her for not giving up on me even when I was about to give up on myself. I count myself lucky having her as my advisor.

My appreciation also goes to the examiners: Professors Michael Buzzelli, Michael Haan, Bruce Newbold, and Andrea Willson. I appreciate your time and efforts. I am also grateful to Professors Laura Wright and Yoko Yoshida for their initial comments on earlier drafts of this dissertation that were presented at the 2018 Canadian Population Society Annual Meeting. I also thank Professor Isaac Luginaah for his interest in my life for the past four years. He has been a source of great inspiration and determination in completing this dissertation. I appreciate his invaluable contributions. Special thanks also go to the staff of the sociology department, including Denise Statham, Jacqui Saunders, Amy Jacob, and Sandra Vilovski.

I am grateful to my friends and colleagues at Western. I especially like to thank Jonathan Amoyaw, Florence Anfaara, Roger Antabe, Awish Aslam, Kilian Atuoye, Jemima Baada, Glenda Babe, Joseph Braimah, Xiangnan Chai, Cliff Davidson, Moses Kansanga, Irenius Konkor, and Eugena Kwon. I would like to thank my family for providing the needed emotional support for the past four years. Thanks for supporting me spiritually throughout my life. Finally, I will also acknowledge the invaluable contribution from the Western Graduate Research Scholarship and Richard Konrad Ontario Graduate Scholarship for their funding and making the completion of this research a success.

Table of contents

List of tables

List of appendices

Chapter 1

1 Introduction

This dissertation explores the complex and interrelated nature of immigrants' oral health, dental insurance coverage, and preventive dental care utilization in Canada. This chapter consists of four sub-sections including 1) literature review, 2) core theoretical arguments, 3) data, and 4) organization of the dissertation.

1.1 Literature review

This section briefly reviews the relevant literature that informs this dissertation. Broadly, this literature alludes to the importance of oral health, dental insurance coverage, and preventive dental care utilization on immigrants' physical, social, psychological, and economic well-being in Canada.

1.1.1 The oral health of immigrants in Canada: Why does it matter?

Representing more than 20 percent of the whole population, immigrants are a growing segment in Canada. In an effort of understanding this population, the health of Canadian immigrants has been well-documented in academic writings. Referred to as the 'healthy immigrant effect', the literature commonly finds that immigrants have better health than the native-born at the time of arrival, although their health advantage often disappears within five to 10 years. The healthy immigrant effect has been observed with health indicators such as self-rated health, chronic diseases, functional limitations, self-rated mental health, and mental disorder (Newbold, 2005a, 2006; Newbold & Danforth, 2003; see also De Maio, 2010; Vang et al., 2017).

While these studies are important, the oral health of adult immigrants is rarely explored in Canada. Paying attention to oral health is important for the general well-being

of immigrants for several reasons. For example, there are systemic linkages between oral health and physical health (Jin et al., 2016). The World Health Organization (2012) states that oral health is essential to social and economic well-being because it enables people to speak, smile, bite, chew, and kiss. Research also shows that oral health is positively associated with psychological measures such as life satisfaction and self-esteem (Benyamini, Leventhal & Leventhal, 2004; Locker, 2009). Moreover, Singhal et al. (2016) find that social welfare recipients who use dental care services are more likely to be employed than those who do not, implying that oral health is important for ensuring labour market success. Based on these studies, optimal oral health may be critical for achieving physical, social, economic, and psychological well-being. In this context, poor oral health may be a barrier for successful immigrant settlement, especially if the healthy immigrant effect extends to oral health in Canada. To this end, Chapter 2 compares oral health among recent immigrants (those who have been in Canada for less than 10 years), established immigrants (those who have been in Canada for 10 years or more), and the native-born in Ontario, Canada.

1.1.2 The importance of dental insurance coverage: The case of immigrants in Canada

Health care utilization is important for maintaining optimal health. Recognizing health as a human right, Canada's universal healthcare system ensures that 'all medically necessary care', including diagnostic, treatment, and preventive health care, is available for its citizens without direct charge (Health Canada, 2006). Unfortunately, dental care is not considered 'medically necessary' in Canada and to date, 56% and 38% of all dental care costs are being covered by private insurance and out-of-pocket payments respectively (CIHI, 2015). Canada treats dental care as a privilege, and this is problematic because more than 30% of Canadians report financial barriers as a primary reason for avoiding dental care or declining recommended dental treatment (Thompson et al., 2014). In addition to the human right perspective, lack of universal dental insurance has been problematized within the cost-benefit perspective (Maund & Stewart, 2017). Specifically, in 2014, there were almost 222,000 visits to physicians in Ontario for dental issues. It is

estimated that these visits added up to at least $7.5 million for Ontario's health care system, although physicians are not appropriate to deal with dental issues due to lack of proper training to treat underlying dental conditions. In this context, healthcare resources may be better utilized once an effective public solution is developed. Although it is the issue for many Canadians, socially and economically vulnerable populations with limited financial resources may disproportionately be affected by lack of universal dental insurance (Yamin & Norheim, 2014). Considering their frequent exposure to labour market challenges in the host society (Reitz, Curtis & Elrick, 2014), it may particularly be challenging for the foreign-born population to obtain dental insurance in Canada.

Lack of health insurance can lead to financial, physical, economic, social, and psychological risks among individuals and households (Ruger, 2007). A similar pattern is observed with dental insurance. Some economically disadvantaged households incur debt or forego basic needs such as food and housing when they have to take care of uninsured dental care expenses (Muirhead et al., 2009; Wallace & MacEntee, 2012). In addition, lack of dental insurance serves as a barrier to dental care utilization. This point is important because underutilization of dental care is associated with poor oral health, which often compromises people's physical, social, economic, and psychological well-being (World Health Organization, 2012). Therefore, the importance of dental insurance should not be narrowly understood only as a financial means to dental care utilization. Dental insurance coverage is arguably important for people's general well-being. Given this background, lack of dental insurance can be conceptualized as a potential barrier to the successful settlement of immigrants in Canada. Chapter 3 compares dental insurance coverage among recent immigrants (those who have been in Canada for less than 10 years), established immigrants (those who have been in Canada for 10 years or more), and the native-born in Ontario, Canada.

1.1.3 The importance of preventive dental care: The case of non-European newly arrived immigrants

Preventive dental care is crucial for achieving oral health through early detection and subsequent timely treatment of dental issues (Locker, Maggirias & Quiñonez 2011).

However, research shows that immigrants, particularly recent immigrants, are less likely to use preventive dental care than the native-born in Canada (Bedos et al., 2004; Newbold & Patel, 2006). These findings may point to the importance of preventive dental care utilization at the early stage of immigrant settlement, as research documents that the oral health of immigrants declines soon after their arrival to Canada (Calvasina, Muntaner & Quiñonez, 2015). Studies show that recent immigrants, especially non-European ones, often face social, cultural, linguistic, and economic barriers to preventive health care utilization (Beiser, 2005; Newbold, 2005b; Batista et al., 2018).

To understand their preventive dental care utilization, it is important to explore the heterogeneous nature of recent immigrants to Canada (Khan et al., 2017). Specifically, recent immigrants are predominantly from non-European regions, such as Asia, Africa, Middle East, South America, and the Caribbean. Many recent immigrants are expected to have different social, cultural, and linguistic characteristics from the native-born and European immigrants. Despite such differences, it is observed that dental care attuned to immigrants' cultural and linguistic differences is limited in Canada (Bowen, 2008; Dong et al., 2011). In addition, it is well-established that non-European recent immigrants are more likely to face labour market challenges than their European counterparts (Buzdugan & Halli, 2009; Nakhaie & Kazemipur, 2013). Considering that dental care is not included as part of Canada's universal healthcare system, financial barriers may restrict some non-European immigrants from accessing preventive dental care. It is possible then that lack of preventive dental care utilization persists as a barrier to achieving optimal oral health among non-European recent immigrants. To this end, Chapter 4 examines the potential disparity in preventive dental care utilization between non-European and European newly arrived immigrants (those who have been in Canada for four years).

1.2 Core theoretical frameworks

There are five main theoretical frameworks in this dissertation including 1) the social determinants of oral health framework, 2) the 'healthy immigrant effect', 3) economic approaches to dental insurance coverage, 4) Andersen's behavioural model of health care utilization, and 5) the institutional approach to immigrant integration. This section shows

how these frameworks are synthesized to understand immigrants' oral health, dental insurance coverage, and preventive dental care utilization.

1.2.1 The social determinants of oral health framework

Oral health research is historically informed by the biomedical and behavioural approaches, which consider oral diseases as a reflection of microbiological and lifestyle conditions (Watt, 2012). For the former, clinical treatment and prevention is deemed valuable in the treatment of oral diseases. For the latter, dental health education intervention plays a role in making positive changes with individual behaviours such as brushing, flossing, drinking, smoking, dietary intake, and dental care attendance. Watt (2007) argues that these 'downstream' approaches are less effective, as individuals' lifestyle choices are often shaped by the social environments in which they are part of.

The social determinants of oral health framework points to a wide range of political, social, and economic drivers of oral health inequalities (Lee & Divaris, 2014). Acknowledging the importance of both individual and structural factors, this framework treats one's position in the social hierarchy as a critical determinant of oral health (Watt & Sheiham, 2012). Specifically, oral health-damaging conditions recognized by the biomedical and behavioural approaches (e.g., exposure to biological and psychosocial risk factors, adoption of unhealthy behaviours, lack of access to healthcare facilities, and lack of social support) are understood as more prevalent among people from lower levels of the social hierarchy, leading to a greater burden of poorer oral health among this population. As oral health research mainly focuses on the biological and behavioural determinants, this framework innovatively serves as a starting point of identifying social sources of oral health inequality. The literature often identifies social and economic characteristics such as racial discrimination, income, and education as significant determinants (Borrell, Burt & Taylor, 2005; Wu et al., 2011). However, immigration status is rarely explored as s social determinant of oral health in Canada.

1.2.2 Unpacking the 'healthy immigrant effect' in Canada

The 'healthy immigrant effect' posits that immigrants are healthier at the time of arrival, but their health advantage often disappears within five to 10 years (De Maio, 2010; Vang et al., 2017). According to Beiser (2005), there are potential explanations for immigration as a social determinant of health in Canada. For example, their initial health advantage is considered a result of selective migration. Self-selection in of itself can play an important role when it comes to oral health. Prospective migrants are likely to be at the high end of the income and health distribution in their home countries, as individuals need adequate physical and financial means to migrate (Kennedy et al., 2015). In addition, Canada requires prospective immigrants to undergo a comprehensive medical screening prior to migration, which can disqualify individuals with health issues.

Immigrants' health advantage often disappears with increasing length of residence at the host country (Beiser, 2005). The convergence and resettlement perspectives here provide potential explanations. The convergence perspective points to the importance of the behavioural approach, suggesting that immigrants may eventually adopt unhealthy lifestyles commonly held among the native-born. These include diets rich in fat and sugar, smoking, drinking, and inadequate daily physical activity (Frisbie, Cho & Hummer, 2001). In contrast, the resettlement perspective centers more on the structural approach. This illustrates that immigrants are often exposed to structural disadvantages in the host society, leading to poor economic, social, and psychological outcomes among this population (Reitz & Banerjee, 2009). Focusing on the intersection between the social determinants of oral health framework and the healthy immigrant effect, Chapter 2 ascertains immigrants' oral health as possibly shaped by both structural and behavioural factors.

1.2.3 Economic approaches to dental insurance coverage

The literature on health insurance coverage is largely directed by economic approaches (Cutler & Zeckhauser, 2004; Hodgson, 2009). Such approaches (e.g., theories of rational choice and human capital) conceptualize individuals as rationally making decisions to

obtain health insurance (Meyer & Pavalko, 1996; Montez, Angel & Angel, 2009). For example, the relationship between income and health insurance coverage is often examined among full-time employers. Specifically, low-waged workers are expected to place little importance on employer-based insurance because they prefer higher income over health insurance benefits (Enthoven & Fuchs, 2006). As per human capital theory, health insurance coverage reflects individual types of human capital investment, such as investment in education and job training (Keene & Prokos, 2007). These frameworks assume health insurance as equally accessible to everyone; but dental care is not covered by Canada's universal healthcare system. Chapter 3 considers dental insurance coverage as a reflection of structural economic barriers faced by vulnerable groups such as the unemployed and those with precarious employment (Blacksher, 2012; Ruger, 2007).

1.2.4 Andersen's behavioural model of health care utilization

Andersen's model is commonly applied in the literature on health care utilization (see Babitsch, Gohl & von Lengerke, 2011). There are three clusters that are considered influential to health care utilization, including predisposing, enabling, and need clusters (Andersen, 1995). Demographic (e.g., age and gender) and social characteristics (e.g., education, employment, marital status, and place of residence) are included as part of the predisposing cluster. The enabling cluster, in turn, is linked to economic, social, and community resources that make health care accessible to people. Such resources include income, health insurance, social support, and available health personnel and facilities. Finally, perceived and/or evaluated health status is incorporated as part of the need cluster. Despite its popularity, this model has been criticized for its lack of theoretical attention to structural barriers to health care utilization as uniquely experienced by minority and vulnerable population including immigrants (Choi, 2011; Gelberg, Andersen & Leake, 2000; Yang & Hwang, 2016). Addressing this void in the literature, Chapter 4 aims to make a theoretical contribution by conceptualizing social, cultural, and economic integration as critical enabling factors for dental care utilization among newly arrived immigrants in Canada.

1.2.5 The institutional approach to immigrant integration

Reitz's institutional approach (1998) is useful in highlighting the possible mechanisms by which institutional structures of immigrant integration influence immigrants' decisions and behaviours regarding dental insurance coverage and dental care utilization in Canada. Immigrant integration is not only influenced by the characteristics of immigrants themselves, but also by the institutional structures of the host society such as immigration policy, labour market structure, educational system, ethnic and racial relations, and social welfare system (Reitz, 1998, 2002). Framing dental care as a type of welfare system in Canada, Chapters 3 and 4 make important theoretical contributions by examining whether immigrants and non-European newly arrived immigrants face disadvantages compared to the native-born and European immigrants regarding access to dental insurance and preventive dental care in Canada.

1.3 Data

This dissertation employs regression techniques to analyze large population datasets. Data are drawn from two datasets including the 2014 Canadian Community Health Survey (CCHS) and Longitudinal Survey of Immigrants to Canada (LSIC).

1.3.1 The Canadian Community Health Survey

The CCHS is a cross-sectional survey that collects information on topics such as diseases and health conditions, health, health care services, lifestyle and social conditions, and mental health and well-being, at the national, provincial and regional levels. Using three sampling frameworks (an area frame, a list frame, and a random digit dialing), the 2014 CCHS samples Canadians living in the 10 provinces and three territories aged 12 and above, with an overall response rate of 62%. It excludes residents living on reserves, full-time members of the Canadian Forces, and the institutionalized. As an optional module, the 2014 CCHS collects information on oral health and its related behaviours in Ontario and Nunavut. This module provides a unique opportunity to compare immigrants and the native-born in terms of self-rated oral health and dental insurance coverage. As the foreign-born population is very small in Nunavut, this dissertation focuses on the sample in Ontario.

1.3.2 The Longitudinal Survey of Immigrants to Canada

Collected by Statistics Canada and Citizenship and Immigration Canada, the LSIC is a nationally representative survey of immigrants who arrived in Canada between 2000 and 2001. This survey includes information relevant to immigrant settlement and integration, including educational attainment, ethnic diversity, values and attitudes, and health and health care utilization. There are three data points including 6 months (wave 1), 2 years (wave 2), and 4 years (wave 3) after the arrival in Canada. The LSIC is useful in exploring preventive dental care utilization among immigrants within a few years of their arrival. Although about 12,000 immigrants aged 15 or older were randomly selected from sampled households in wave 1, the sample included only 9,300 and 7,700 immigrants in waves 2 and 3 respectively, due to attrition. Statistics Canada provides the longitudinal weights to address this sample attrition.

1.4 Organization of the dissertation

This dissertation consists of five chapters. After this introductory chapter, three integrated articles are presented. Chapter 2 examines whether the 'healthy immigrant effect' extends to oral health in Ontario, Canada. Specifically, Chapter 2 seeks to understand 1) whether recent immigrants have better oral health than the native-born, 2) whether an oral health advantage, if exists, disappears among established immigrants, and 3) which factors may explain immigrants' declining oral health. Chapter 3 examines 1) whether recent and established immigrants are differently covered by dental insurance than the native-born, and if so, 2) what factors may explain such disparities in dental insurance coverage. Chapter 4 explores 1) the relationship between preventive dental care utilization and immigrant source region among newly arrived immigrants and 2) to what extent do social, cultural, and economic enabling factors explain this relationship. Chapter 5

concludes this dissertation by revisiting the main findings of the three integrated articles and providing several recommendations for policymakers and future research.

1.5 References

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

Babitsch, B., Gohl, D., & von Lengerke, T. (2012). Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998–2011. *GMS Psycho-Social-Medicine*, *9*.

Batista, R., Pottie, K., Bouchard, L., Ng, E., Tanuseputro, P., & Tugwell, P. (2018). Primary health care models addressing health equity for immigrants: a systematic scoping review. *Journal of Immigrant and Minority Health*, *20*(1), 214-230.

Bedos, C., Brodeur, M., Benigeri, M., & Olivier, M. (2004). Utilization of preventive dental services by recent immigrants in Quebec. *Canadian Journal of Public Health*, *95*(3), 219–223.

Beiser, M. (2005). The health of immigrants and refugees in Canada. *Canadian Journal of Public Health*, *96*(2), S30-S44.

Benyamini, Y., Leventhal, H., & Leventhal, E. A. (2004). Self-rated oral health as an independent predictor of self-rated general health, self-esteem and life satisfaction. *Social Science & Medicine*, *59*(5), 1109-1116.

Blacksher, E. (2012). Redistribution and recognition: Pursuing social justice in public health. *Cambridge Quarterly of Healthcare Ethics*, *21*(3), 320-331.

Borrell, L. N., Burt, B. A., & Taylor, G. W. (2005). Prevalence and trends in periodontitis in the USA: from the NHANES III to the NHANES, 1988 to 2000. *Journal of Dental Research*, *84*(10), 924-930.

Bowen, S. (2008). Providing care in a changing society: what do health care providers really need to know about cultural diversity? *Canadian Journal of Dental Hygiene*, *42*(2), 108-113.

Buzdugan, R., & Halli, S. S. (2009). Labor Market Experiences of Canadian Immigrants with Focus on Foreign Education and Experience. *International Migration Review*, *43*(2), 366-386.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2015). The deterioration of C anadian immigrants' oral health: analysis of the Longitudinal Survey of Immigrants to Canada. *Community Dentistry and Oral Epidemiology*, *43*(5), 424-432.

Choi, S. (2011). A critical review of theoretical frameworks for health service use among older immigrants in the United States. *Social Theory & Health*, *9*(2), 183-202.

CIHI. (2015). *National Health Expenditure Trends, 1975 to 2015*. Toronto, ON: CIHI. https://secure.cihi.ca/free_products/nhex_trends_narrative_report_2015_en.pdf. Accessed on August 27, 2018.

Cutler, D. M., & Zeckhauser, R. (2004). Extending the Theory to Meet the Practice of Insurance. In R. Litan & R. Herring (Eds.), *Brookings-Wharton Papers on Financial Services* (pp. 1-52). Washington DC: Brookings Institution.

De Maio, F. G. (2010). Immigration as pathogenic: a systematic review of the health of immigrants to Canada. *International Journal for Equity in Health*, *9*(1), 27.

Dong, M., Levine, A., Loignon, C., & Bedos, C. (2011). Chinese immigrants' dental care pathways in Montreal, Canada. *Journal of the Canadian Dental Association*, *77*, b131.

Enthoven, A. C., & Fuchs, V. R. (2006). Employment-based health insurance: Past, present, and future. *Health Affairs*, *25*(6), 1538-1547.

Frisbie, W., Cho, Y., & 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.

Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*, *34*(6), 1273-1302.

Health Canada. (2006) *Canada Health Act: Annual Report 2005–2006*. Ottawa, ON: Health Canada. http://www.hcsc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/chaar-ralcs-0506/chaar-ralcs-0506_e.pdf. Accessed on August 27, 2018.

Hodgson, G. M. (2009). Towards an alternative economics of health care. *Health Economics, Policy and Law*, *4*(1), 99-114.

Jin, L. J., Lamster, I. B., Greenspan, J. S., Pitts, N. B., Scully, C., & Warnakulasuriya, S. (2016). Global burden of oral diseases: emerging concepts, management and interplay with systemic health. *Oral Diseases*, *22*(7), 609-619.

Keene, J. R., & Prokos, A. H. (2007). Comparing Offers and Take-ups of Employee Health Insurance across Race, Gender, and Decade. *Sociological Inquiry*, *77*(3), 425-459.

Kennedy, S., Kidd, M. P., McDonald, J. T., & Biddle, N. (2015). The healthy immigrant effect: patterns and evidence from four countries. *Journal of International Migration and Integration*, *16*(2), 317-332.

Khan, M. M., Kobayashi, K., Vang, Z. M., & Lee, S. M. (2017). Are visible minorities "invisible" in Canadian health data and research? A scoping review. *International Journal of Migration, Health and Social Care*, *13*(1), 126-143.

Lee, J. Y., & Divaris, K. (2014). The ethical imperative of addressing oral health disparities: a unifying framework. *Journal of Dental Research*, *93*(3), 224-230.

Locker, D. (2009). Self-esteem and socioeconomic disparities in self-perceived oral health. *Journal of Public Health Dentistry*, *69*(1), 1-8.

Locker, D., Maggirias, J., & Quiñonez, C. (2011). Income, dental insurance coverage, and financial barriers to dental care among Canadian adults. *Journal of Public Health Dentistry*, *71*(4), 327-334.

Maund, J., & Stewart, H. (2017). *Private dental care fails millions in Ontario*. The Record. https://www.therecord.com/opinion-story/7223469-private-dental-care-fails-millions-in-ontario. Accessed on August 27, 2018.

Meyer, M. H., & Pavalko, E. K. (1996). Family, work, and access to health insurance among mature women. *Journal of Health and Social Behavior*, *37*(4), 311-325.

Montez, J. K., Angel, J. L., & Angel, R. J. (2009). Employment, marriage, and inequality in health insurance for Mexican-origin women. *Journal of Health and Social Behavior*, *50*(2), 132-148.

Muirhead, V. E., Quinonez, C., Figueiredo, R., & Locker, D. (2009). Predictors of dental care utilization among working poor Canadians. *Community Dentistry and Oral Epidemiology*, *37*(3), 199-208.

Nakhaie, M. R., & Kazemipur, A. (2013). Social capital, employment and occupational status of the new immigrants in Canada. *Journal of International Migration and Integration*, *14*(3), 419-437.

Newbold, K. B. (2005a). Self-rated health within the Canadian immigrant population: risk and the healthy immigrant effect. *Social Science & Medicine*, *60*(6), 1359-1370.

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

Newbold, K. B. (2006). Chronic conditions and the healthy immigrant effect: evidence from Canadian immigrants. *Journal of Ethnic and Migration Studies*, *32*(5), 765-784.

Newbold, K. B., & Danforth, J. (2003). Health status and Canada's immigrant population. *Social Science & Medicine*, *57*(10), 1981-1995.

Newbold, K. B., & Patel, A. (2006). Use of dental services by immigrant Canadians. *Journal of the Canadian Dental Association*, *72*(2), 143.

Reitz, J. G. (1998). *Warmth of the Welcome: The Social Causes of Economic Success for Immigrants in Different Nations and Cities*. Boulder, CO: Westview Press.

Reitz, J. G. (2002). Host societies and the reception of immigrants: research themes, emerging theories and methodological issues. *International Migration Review*, *36*(4), 1005-1019.

Reitz, J. G., & Banerjee, R. (2009). Racial inequality and social cohesion. In J. G. Reitz, K. K. Breton, & K. L. Dion (Eds.), *Multiculturalism and social cohesion: Potentials and challenges of diversity* (pp.123-155). New York, NY: Springer.

Reitz, J. G., Curtis, J., & Elrick, J. (2014). Immigrant skill utilization: Trends and policy issues. *Journal of International Migration and Integration*, *15*(1), 1-26.

Ruger, J. P. (2007). The moral foundations of health insurance. *Journal of the Association of Physicians*, *100*(1), 53-57.

Singhal, S., Mamdani, M., Mitchell, A., Tenenbaum, H., Lebovic, G., & Quiñonez, C. (2016). Dental treatment and employment outcomes among social assistance recipients in Ontario, Canada. *Health Policy*, *120*(10), 1202-1208.

Thompson, B., Cooney, P., Lawrence, H., Ravaghi, V., & Quiñonez, C. (2014). Cost as a barrier to accessing dental care: findings from a Canadian population-based study. *Journal of Public Health Dentistry*, *74*(3), 210-218.

Vang, Z. M., Sigouin, J., Flenon, A., & Gagnon, A. (2017). Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. *Ethnicity & Health*, *22*(3), 209-241.

Wallace, B. B., & MacEntee, M. I. (2012). Access to dental care for low-income adults: perceptions of affordability, availability and acceptability. *Journal of Community Health*, *37*(1), 32-39.

Watt, R. G. (2007). From victim blaming to upstream action: tackling the social determinants of oral health inequalities. *Community Dentistry and Oral Epidemiology*, *35*(1), 1-11.

Watt, R. G. (2012). Social determinants of oral health inequalities: implications for action. *Community Dentistry and Oral Epidemiology*, *40*, 44-48.

Watt, R. G., & Sheiham, A. (2012). Integrating the common risk factor approach into a social determinants framework. *Community Dentistry and Oral Epidemiology*, *40*(4), 289-296.

World Health Organization. (2012). Oral health information sheet. Geneva, Switzerland: World Health Organization. http://www.who.int/oral_health/publications/factsheet. Accessed on August 27, 2018.

Wu, B., Plassman, B. L., Liang, J., Remle, R. C., Bai, L., & Crout, R. J. (2011). Differences in self-reported oral health among community-dwelling black, Hispanic, and white elders. *Journal of Aging and Health*, *23*(2), 267-288.

Yamin, A. E., & Norheim, O. F. (2014). Taking equality seriously: applying human rights frameworks to priority setting in health. *Human Rights Quarterly*, *36*(2), 296-324.

Yang, P. Q., & Hwang, S. H. (2016). Explaining immigrant health service utilization: A theoretical framework. *Sage Open*, *6*(2), 1-15.

Chapter 2

2. Immigration as a social determinant of oral health: Does the 'healthy immigrant effect' extend to self-rated oral health in Ontario, Canada?

2.1 Introduction

In Canada, it is well-established that immigrants have better physical and mental health than the native-born at the time of arrival. However, the 'healthy immigrant effect' posits that their health advantage usually disappears within five years to 10 years (De Maio, 2010; Vang et al., 2017). Oral health is less well studied, except for immigrant children (Reza et al., 2016), and little is known about adult immigrants' oral health.

According to the World Health Organization (2012), oral health is 'a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity'. Poor oral health is a serious issue for several reasons. For one thing, research suggests periodontal diseases are systemically linked to many chronic diseases, including hypertension, diabetes, respiratory disease, coronary heart disease, and cardiovascular disease (Jin et al., 2016). Moreover, oral health is essential to social and economic well-being, as it gives people the ability to speak, smile, bite, chew, and kiss. Thus, it is not surprising that poor oral health is associated with lower levels of life satisfaction and self-esteem (Benyamini, Leventhal & Leventhal, 2004; Locker, 2009). Research also shows that dental treatments lead to improved employment outcomes among social welfare recipients, leading researchers to conclude that poor oral health may limit economic opportunities (Singhal et al., 2016).

Given its possibly dire consequences for physical, social, and economic well-being, poor oral health may be a major barrier for successful immigrant settlement. Despite this concern, adult immigrants' oral health is rarely explored in Canada. Drawing on data from the 2014 Canadian Community Health Survey and using self-rated oral

health as an indicator of oral health, we addressed this void in the literature by exploring whether the healthy immigrant effect extends to adult oral health in Ontario, Canada. Specifically, we asked 1) if recent immigrants report better oral health than the native-born, 2) whether an oral health advantage, if it exists, disappears among established immigrants, and, if so, 3) what factors might explain this declining oral health.

2.2 Literature review

There is a growing, yet scant, body of literature on adult immigrants' oral health in large immigrant-receiving countries, including Canada (Calvasina, Muntaner & Quiñonez, 2015; Cruz et al., 2001, 2004; Ghiabi, Matthews & Brillant, 2014; Mariño et al., 2001; Sgan-Cohen et al., 1992). Unfortunately, these studies focus exclusively on the foreign-born population and thus lack a theoretical approach to possible oral health inequalities between immigrants and the native-born. This study links two research areas to create a viable theoretical lens: the social determinants of oral health and immigration as a social determinant of health. In the former, there is growing consensus that oral health is influenced by structural inequalities at the societal level. In the latter, it is widely documented that immigrants' health is often compromised by exposure to social, economic, cultural, and political disadvantages in the host society. The following sections identify the intersection of these two research areas and generate the research hypotheses for this study.

2.2.1 Exploring the social determinants of oral health

The social determinants of health (SDH) framework highlights health inequalities generated by structural inequalities rooted in the broader social, economic, cultural, and political context. According to the World Health Organization's Commission on Social Determinants of Health, the relative positions of individuals within social hierarchies are important considerations when studying health inequalities at the societal level (Solar & Irwin, 2010). Individuals from lower levels of the hierarchy are often more exposed to health-damaging conditions (e.g., lack of material resources, exposure to biological and psychosocial risk factors, adoption of unhealthy behaviours, lack of access to healthcare

facilities, and lack of social support), leading to a greater burden of ill-health among this demographic. Therefore, understanding aspects of structural inequalities, such as socioeconomic, racial, and gender inequalities, is critical for reducing health inequalities.

Although the SDH framework is commonly applied to physical health, it is increasingly extended to oral health. Oral health research traditionally employs a narrow and reductionist approach, separating the mouth from the rest of the body (Watt, 2007). However, the effectiveness of this approach may be questionable, as evidence suggests oral and chronic diseases share common risk factors (Sheiham & Watt, 2000). In fact, complex sets of lifestyle choices, various psychosocial risks, social support, and access to dental care facilities interact to influence oral health. For example, poor oral health is linked to unhealthy lifestyle choices, such as poor dietary habits, poor oral hygiene practice, alcohol consumption, tobacco use, lack of physical exercise, and limited usage of dental care (Petersen, 2003). Another research suggests that psychosocial factors, such as life stress, work stress, life satisfaction, and self-esteem, are significant predictors of oral health (Finlayson et al., 2010). It is argued that psychosocial vulnerabilities can worsen the functions of the immune system and disturb oral hygiene practice routines and dietary habits. Similarly, although conceptualized in many ways, social support can affect oral health. For example, lack of social interactions with friends and neighbours and lower levels of sense of belonging to the community are correlated with poor oral health (McGrath & Bedi, 2002; Locker, 2009). Importantly, social support can not only improve biological and psychological responses to the immune system; it can also allow people to exchange information about dental care systems and enhance the use of dental care services (Batra et al., 2014).

Recognizing that oral health and physical health have common risk factors, Watt and Sheiham (2012) call for extending the SDH framework to oral health, arguing that oral health risk factors (e.g., lifestyle choices, psychosocial status, access to social support, and access to dental care) are generated within broader social, economic, cultural, and political contexts. According to the social determinants of oral health framework, individuals on lower levels of the social hierarchy are more exposed to oral health-damaging conditions than those on higher levels. For example, it is widely

observed that socioeconomic status, measured by such factors as income, employment status, and educational attainment, is inversely associated with oral health status, including dental caries, tooth loss, oral cancer, periodontal disease, and self-rated oral health (Elani et al., 2012). Research in the US finds African and Mexican Americans have poorer oral health than their white counterparts, largely because of racial discrimination and socioeconomic vulnerabilities (Borrell et al., 2005; Wu et al., 2011). While social determinants of oral health are increasingly documented in the literature, immigration is rarely added to the research mix. The next section asks whether immigrants to Canada are exposed to unique social, economic, cultural, and political vulnerabilities that put them more at risk of developing poor oral health than the native-born.

2.2.2 Exploring health inequalities between immigrants and the native-born in Canada: Making the case for oral health

The healthy immigrant effect posits that immigrants are healthier than the native-born at the time of arrival in Canada, although their health advantage disappears relatively quickly. This initial health advantage is explained two ways (De Maio, 2010; Vang et al., 2017). First, immigrants have to undergo comprehensive medical screening so that Canada can disqualify those with severe medical conditions from migration. Second, young, well-educated, and healthy individuals tend to self-select to migrate more than their older, less-educated, and unhealthy counterparts. Coupled with the points system,[1] this ensures Canada selects immigrants with high levels of human capital to contribute to the country.

Although comprehensive dental screening is not part of Canada's immigration process (Ghiabi et al., 2014), the self-selective nature of immigration may predict that recent immigrants have better oral health than the native-born for several reasons. For one thing, age is an important biological determinant of oral health, and younger people have better oral health than older ones (Petersen & Yamamoto, 2005). This may provide an

[1] The points system allows Canada to select immigrants based on human capital characteristics, such as education, host country language proficiency, professional skills, and age.

oral health advantage among recent immigrants, as they are younger than the native-born, on average. In addition, evidence suggests recent immigrants have lower rates of chronic diseases than the native-born in Canada (Newbold, 2006; Ng et al., 2005; Pérez, 2002). This superior physical health status may be beneficial to their oral health, as research indicates oral diseases and chronic diseases often have the same risk factors (Sheiham & Watt, 2000). Based on these arguments, we hypothesize that recent immigrants have better oral health than the native-born.

While healthier than the native-born at the time of arrival, immigrants lose their superior health status within five to 10 years. According to Beiser (2005), there are two ways of understanding their declining health status. For one, the convergence perspective suggests that with increasing length of time in Canada, immigrants take on the same risk factors as the native-born. Specifically, as part of their integration into the host society, they may be introduced to unhealthy lifestyle choices, including diets rich in fat and sugar, smoking, drinking, and inadequate daily physical activity (Frisbie, Cho & Hummer, 2001). For another, certain traditional, beneficial habits may be abandoned upon arrival. For example, chewing and cleaning sticks are used by the residents of some countries to remove plaque (Adams et al., 2013) but such practices may not be maintained upon immigration. An Israeli study finds that the abandonment of traditional chewing and cleaning sticks among immigrants partly contributes to their declining oral health after their arrival (Sgan-Cohen et al., 1992). For these reasons, we hypothesize that an initial oral health advantage disappears among established immigrants, a disappearance partly explained by the exposure to unhealthy lifestyle choices.

The convergence perspective posits that the health of immigrants becomes similar to that of the native-born over time because of their ongoing exposure to existing environmental risk factors, such as the unhealthy lifestyles of the native-born. Yet some researchers also find that immigrants can have worse health status than the native-born with increasing length of time in Canada. For example, although recent immigrants are likely to report better self-rated physical health, established immigrants are more likely to report worse health than the native-born (Veenstra, 2009). A similar trend is observed among the Canadian population aged 45 to 64 (Gee, Kobayashi & Prus, 2004). Pérez

(2002) finds that long-term immigrants have a higher prevalence of chronic diseases than the native-born, although the prevalence is lower for recent immigrants.

Reflecting on these findings, Beiser (2005) introduces the resettlement stress perspective, emphasizing that recent immigrants often face unique structural barriers that prevent them from maintaining their superior health status. For example, despite their high levels of human capital, immigrants to Canada often remain economically vulnerable. This is often attributed to under-/non-recognition of their educational and professional credentials from their home countries and labour market racial discrimination (Buzdugan & Halli, 2009; Reitz, Curtis & Elrick, 2014). In addition, as host country language proficiency is an important human capital factor, some of the economic vulnerability may be attributed to immigrants' lack of proficiency in English or French (Boyd & Cao, 2009). In any event, many recent immigrants experience economic hardships, including poverty, low income, precarious employment, and unemployment. Their economically disadvantaged position may lead to the gradual adoption of unhealthy lifestyle choices, such as smoking and drinking (Abraído-Lanza, Chao & Florez, 2005), and also result in limited access to dental care services. Although medically necessary physician and hospital visits are covered by Canada's universal healthcare system, individuals are generally responsible for the full cost of dental care (Bhatti, Rana & Grootendorst, 2007). Dental insurance is mostly acquired through employment or by individual purchase (Locker, Maggirias & Quiñonez 2011). As recent immigrants are often economically disadvantaged by being unemployed or precariously employed, financing dental care through dental insurance or out-of-pocket expenditures may be particularly difficult (Calvasina, Muntaner & Quiñonez, 2014; Newbold & Patel, 2006).

Exposure to psychosocial risk is another possible factor in oral health inequalities between immigrants and the native-born. Research suggests immigrants are more likely to have poor psychosocial status, such as lower levels of life satisfaction and higher levels of perceived racial discrimination, than are the native-born (Reitz & Banerjee, 2009). As these psychosocial vulnerabilities can negatively modify the immune system and affect lifestyle choices, immigrants may be more at risk of developing poor oral health than the native-born. Similarly, it is known that immigrants often have lower levels of social

support than the native-born, when social support is measured as a sense of belonging to Canada and a sense of trust towards neighbours (Gilkinson & Sauvé, 2010; Reitz & Banerjee, 2009). Importantly, a lack of social support may reflect limited social interactions (Hagerty et al., 1996), possibly creating a barrier preventing immigrants from exchanging information about dental care services. This may be particularly problematic among recent immigrants, as they may face unique barriers to healthcare utilization, such as limited official language proficiency or a lack of comprehensive knowledge about Canadian healthcare services (Wang, Rosenberg & Lo, 2008; Zanchetta & Poureslami, 2006). We therefore hypothesize that an initial oral health advantage disappears among established immigrants, partly because of their exposure to social, economic, and psychosocial vulnerabilities.

2.3 Data and analysis

We drew on data from the 2014 Canadian Community Health Survey (CCHS). The CCHS is a cross-sectional survey that collects information on health indicators, including oral health, physical health, access to healthcare services, and lifestyle and social conditions. Using three sampling frameworks (an area frame, a list frame, and a random digit dialing), the CCHS samples Canadians living in the 10 provinces and three territories aged 12 and above. It excludes residents living on reserves, full-time members of the Canadian Forces, and the institutionalized. In the 2014 CCHS, Ontario and Nunavut were selected for content modules on oral health and its related behaviours. Given the small sample size of immigrants in Nunavut, we focused on Ontario residents. We further restricted the sample to the adult population aged 18 and above. Missing cases accounted for more than 10% of the sample; we used the Markov chain Monte Carlo method to address these missing cases. Based on Rubin's rules for scalar estimands (Rubin, 1987), we combined 10 imputed datasets and averaged them to obtain mean model parameter estimates. The final weighted sample included 8,046,430 native-born Ontarians, 2,065,780 established immigrants, and 254,390 recent immigrants.

2.3.1 Dependent variable

The dependent variable for this study is 'self-rated oral health'. There is general agreement in the literature that self-rated oral health is a valid and reliable indicator of overall oral health at the population level (Locker, Maggirias & Wexler, 2009). The CCHS has five response categories for self-rated oral health: excellent, very good, good, fair, and poor. We created a binary variable combining excellent, very good, and good into 'good' and fair and poor into 'poor' (0=good; 1=poor).

2.3.2 Independent and control variables

The independent variable is 'length of residence in Canada', measuring how long immigrants have been in Canada since their arrival (0=native-born; 1=10 years or more; 2=9 years or less). Based on the social determinants of oral health framework as well as the literature review mentioned above, we created three sets of control variables: first, variables capturing the resettlement stress perspective (e.g., visible minority status, gender, marital status, household income adequacy, employment status, regular access to dental care, perceived life stress, life satisfaction, and sense of belonging to community); second, variables capturing the convergence perspective (e.g., type of smoker, alcohol consumption, frequency of physical activity, daily fruit/vegetable consumption, and frequency of brushing teeth); and third, variables indicating immigrant selectivity (e.g., age of respondents, level of education, and self-rated physical health).

2.3.3 Statistical analysis

For the study, we performed two separate analyses. First, we used cross-classification analysis to ascertain the distributions of the dependent and independent variables by length of residence in Canada. Second, we conducted regression analysis to estimate whether length of residence in Canada is associated with self-rated oral health. For the regression analysis, we chose a logistic regression technique, because the dependent variable is dichotomous (Hosmer, Lemeshow & Sturdivantet, 2013). Models were built sequentially. We estimated the bivariate relationship between self-rated oral health and

length of residence in Canada in Model 1, while Models 2, 3, and 4 further controlled for variables capturing the resettlement stress perspective, convergence perspective, and immigrant selectivity, respectively. For more meaningful interpretation, results were reported with odds ratios (ORs). ORs larger than 1 indicate higher odds of reporting poor oral health, while ORs smaller than 1 indicate lower odds of doing so. Results from the cross-classification analysis and logistic regression analysis were adjusted using sampling weights.

2.4 Results

2.4.1 Cross-classification analysis

Table 1 shows findings from the cross-classification analysis. There are four main findings. First, compared to the native-born (13.9%), fewer recent immigrants (11.5%) but more established ones (20.4%) report poor oral health, suggesting the healthy immigrant effect may apply to oral health. Second, recent immigrants are more exposed to risk factors associated with resettlement stress than established immigrants or the native-born. For example, the majority of recent immigrants are visible minorities (85.7%); proportions drop for established immigrants (55.6%) and drop even farther for the native-born (7.0%). A larger proportion of recent immigrants fall into the lowest category of household income adequacy (5.4%) compared to the native-born (1.3%) or established immigrants (1.6%). Fewer recent immigrants report annual access to dental care (59.9%) than the native-born (75.3%) or established immigrants (71.8%). In addition, having a very weak sense of belonging to community is more common among recent immigrants (12.8%) than the native-born (8.7%) or established immigrants (6.2%). Third, our findings only partly support the convergence perspective. For example, the proportion of alcohol consumption is higher for established immigrants (66.9%) than for recent immigrants (62.6%), and more recent immigrants (85.0%) report brushing their teeth at least twice a day than established immigrants (82.7%). However, smoking daily or occasionally is more prevalent among recent immigrants (16.5%) than established immigrants (11.2%). It is also noteworthy that more native-born (70.5%) report regular physical activity than recent (51.5%) or established immigrants (58.3%). Finally, we find

evidence of immigrant selectivity. Recent immigrants are younger on average than the native-born or established immigrants (33.5 years, 46.0 years, and 54.2 years, respectively). Similarly, more recent immigrants (70.8%) report post-secondary education than the native-born (59.9%) or established immigrants (60.1%). Finally, fewer recent immigrants (5.6%) report poor physical health than the native-born (12.3%) or established immigrants (16.5%).

2.4.2 Logistic regression analysis

Findings from the logistic regression analysis are shown in Table 2. Overall, the impact of length of residence in Canada on self-rated oral health is modified by the resettlement stress factors, the convergence factors, and immigrant selectivity. In Model 1, established immigrants are shown to be more likely to report poor oral health than the native-born at the bivariate level (OR=1.59; $p<0.001$). However, the difference between recent immigrants and the native-born is not statistically significant (OR=0.80; $p>0.05$). After adjusting for the resettlement stress characteristics in Model 2, the relationship between self-rated oral health and length of residence in Canada is modified. Specifically, once household income adequacy and access to dental care are controlled for, the difference between established immigrants and the native-born is partly attenuated (OR=1.35; $p<0.01$), while the difference between recent immigrants and the native-born is largely suppressed (OR=0.46; $p<0.01$). In Model 3, recent immigrants' oral health advantage relative to the native-born is partly explained by convergence characteristics, particularly type of smoker (OR=0.47; $p<0.05$). Finally, the difference between recent immigrants and the native-born is no longer significant in Model 4, when immigrant selectivity, specifically self-rated physical health, is accounted for (OR=0.58; $p>0.05$).

In addition to length of residence in Canada, a wide range of social, economic, psychosocial, and behavioural factors are significantly associated with self-rated oral health. When we look at social and economic factors, we find blacks (OR=0.55; $p<0.05$) are less likely to report poor oral health than whites, but Chinese (OR=2.15; $p<0.01$) are more likely to report poor oral health than whites. Men are more likely to report poor oral health than women (OR=1.24; $p<0.05$). In addition, people from the higher (OR=1.35;

p<0.01), middle (OR=1.62; p<0.01), and lower categories of household income adequacy (OR=2.37; p<0.001) are more likely to report poor oral health than those from the highest category. When we turn to psychosocial factors, we find people who have not visited a dentist at least once in the last 12 months are more likely to report poor oral health than those who have (OR=2.54; p<0.001). Moreover, being neither dissatisfied/very dissatisfied (OR=1.65; p<0.01) nor satisfied with life (OR=1.36; p<0.01) is associated with higher odds of reporting poor oral health than is being very satisfied. People with a very weak (OR=1.81; p<0.01) and somewhat weak sense of belonging to their community (OR=1.67; p<0.001) are also more likely to report poor oral health than those with a very strong sense of belonging. A number of behavioural factors are significantly associated with oral health as well. For example, daily smokers are more likely to report poor oral health than non-smokers (OR=2.15; p<0.001), and people with occasional (OR=1.26; p<0.05) or infrequent physical activity (OR=1.28; p<0.05) are more likely to report poor oral health than those with regular physical activity. Similarly, brushing one's teeth less than twice a day is associated with higher odds of reporting poor oral health (OR=1.31; p<0.05). Finally, poor self-rated physical health is associated with poor self-rated oral health (OR=3.05; p<0.001).

2.5 Discussion and conclusions

Although research widely documents that immigrants' physical and mental health indicates the healthy immigrant effect, little is known about oral health. Does the healthy immigrant effect exist for oral health, and if so, does it change over time? To answer these questions, we bridge two areas of research—the social determinants of oral health and immigration as a social determinant of health—to frame immigrants' oral health within broader social, economic, cultural, and political contexts. Using this theoretical framework, we compare self-rated oral health among recent immigrants, established immigrants, and the native-born in Ontario, Canada.

Despite common findings in Canada that recent immigrants have better physical and mental health than the native-born (De Maio, 2010; Vang et al., 2017), we do not observe recent immigrants to have better oral health than the native-born. As we see it,

there are two possible reasons for this unexpected outcome. First, immigrants are required to undergo a comprehensive health examination before migration, but this does not include oral health (Ghiabi et al., 2014). As our descriptive statistics indicate, a much higher proportion of recent immigrants report poor oral health (11.5%) than poor physical health (5.6%), suggesting immigrants with oral health issues are admitted to Canada. Second, we have considered immigrants who had been in Canada for nine years or less to be recent immigrants. We acknowledge the importance of comparing more recent immigrants (e.g., those in Canada for less than five years) to the native-born to test the healthy immigrant effect. In fact, research shows that some immigrants' oral health deteriorates as quickly as two years after their arrival (Calvasina et al., 2015). Unfortunately, because of the small sample size, we were not able to break down recency of arrival.

Interestingly, recent immigrants are less likely to report poor oral health than the native-born, once the resettlement stress factors, particularly household income adequacy and access to dental care, are adjusted for. This may point to the role of selective immigration in explaining recent immigrants' oral health, especially as its significant impact is completely attenuated when type of smoker and self-rated physical health are added to the models. As highlighted by the common risk factor approach (Sheiham & Watt, 2000), oral health is closely related to physical health and its risk factors, such as unhealthy lifestyle choices. It is well-established that the comprehensive medical screening for immigrants contributes to the lower prevalence of chronic diseases among recent immigrants (Newbold, 2006; Ng et al., 2005; Pérez, 2002). Given the linkage between oral and physical health, it is possible that individuals with severe oral health issues are also disqualified from migrating to Canada. By the same token, despite their economically vulnerable position and low rate of utilizing dental care services in Canada, recent immigrants' oral health may be similar to that of the native-born, possibly because of their better physical health and healthier lifestyle choices, including lower incidence of daily smoking.

Consistent with previous studies using physical health indicators (Gee et al., 2004; Pérez, 2002; Veenstra, 2009), we find that immigrants' oral health deteriorates after 10

years in Canada, making it worse than the oral health of the native-born. Established immigrants' oral health disadvantage relative to the native-born is partially explained by the resettlement stress perspective, particularly household income adequacy and access to dental care. According to our descriptive statistics, even though established immigrants fare better in the measurement of household income adequacy than recent immigrants, they are still disadvantaged compared to the native-born. Previous research suggests immigrants' earnings may not catch up with those of the native-born, although their earnings expand with an increasing length of time in Canada (Hum & Simpson, 2004). Moreover, established immigrants, especially visible minorities and those with limited host country language proficiency, continue to face barriers to economic integration, such as underemployment or part-time employment (Galarneau & Morissette, 2008; Hira-Friesen, 2017). Thus, immigrants' economically disadvantaged position may influence their oral health negatively, even after 10 years in Canada.

However, we cannot fully explain why established immigrants have worse oral health than the native-born. We suggest three possible explanations for this unexplained outcome. First, despite established evidence that sugar and fat intakes rise with increasing length of time in Canada (Lesser, Gasevic & Lear, 2014), we were not able to control for them, given the limitations of the CCHS. Although the convergence factors do not explain established immigrants' oral health disadvantage in our study, it is possible that sugar and fat intakes put them at risk of developing poor oral health (Petersen, 2003). Second, the relationship between health status and social environments is not static but dynamic (Pavalko & Willson, 2011), highlighting the importance of understanding the intra-individual nature of health changes over time. In our study context, it is possible that immigrants' declining oral health over time reflects their cumulative exposure to a wide range of social, economic, and political disadvantages (Dean & Wilson, 2009). Third, due to changes in Canada's immigration policy, it is important to account for the cohort effect, as immigrants in earlier cohorts may have different characteristics than more recent ones (Kobayashi & Prus, 2012). Established immigrants are predominantly from Europe, while more recent source countries are found in Asia, the Middle East, the Caribbean, and Africa. Notwithstanding the social, cultural and economic differences among these world regions, levels of human capital at the time of arrival were also lower

among earlier immigrants than they are among the more recent ones. Consequently, established immigrants may not have had a health advantage over the native-born at their time of arrival. Unfortunately, the cross-sectional nature of the CCHS does not allow us to explain whether oral health is influenced by intra-individual variations or the cohort effect.

In light of our findings, we can offer several policy recommendations. Given the finding that immigrants' declining oral health may be linked to their economically vulnerable position in Canada, it would be helpful to address economic inequalities between immigrants and the native-born. Previous studies suggest that providing immigrants with opportunities to upgrade their educational and professional credentials and improve their language proficiency is a promising strategy (Kaida, 2013). This may lead to non-precarious jobs, which often provide health benefits, including dental insurance. As immigrants' oral health declines over time, oral health interventions targeting them are particularly needed. Ensuring access to affordable and culturally sensitive dental care and creating opportunities to learn about oral health and its related behaviours could be critical in reducing immigrants' oral health burden in Canada.

There are several limitations to this study. As mentioned above, one limitation is the cross-sectional nature of the CCHS. Longitudinal information about oral health is very limited in Canada, however. Although the Longitudinal Survey of Immigrants to Canada allows us to explore immigrants' oral health over a four-year period after arrival (Calvasina et al., 2015), the sample is solely focused on immigrants. This does not allow us to compare the oral health of immigrants to the native-born. In addition, the CCHS does not include clinically measured oral health variables. We recommend future studies incorporate clinically constructed indicators of oral health, such as untreated cavities, false teeth, and salivary flow, to examine whether the healthy immigrant effect extends to oral health (see Ghiabi et al., 2014). Comparing self-rated oral health and clinical indicators may be particularly useful in unpacking the trajectory of immigrants' oral health over time in the host society, which is likely to be informed by the cultural understandings of oral health. In this context, employing in-depth qualitative approaches would be helpful in capturing immigrants' lived experiences and perceptions about oral

health and its related issues in relation to immigrant source region as well as length of residence in Canada.

Moreover, the CCHS does not allow us to explore the role of immigrant class on oral health. Studies show that refugees may have poorer physical and mental health than family-class and economic-class immigrants at the time of arrival (Amoyaw & Abada, 2016; Newbold, 2009). It is possible, then, that refugees are more vulnerable in their oral health. Finally, our sample was limited to Ontario. Previous research suggests that the economic and social experiences of immigrants are different between gateway destinations such as Ontario and non-gateway destinations such as the Prairies or Atlantic Canada (Haan, 2008; Ray & Preston, 2013; Sano, Kaida & Swiss, 2017). Accordingly, oral health trajectories may differ. We therefore recommend that future studies use nationally representative surveys to examine oral health inequalities between immigrants and the native-born; the results may inform oral health policies at the national level.

Table 2.1 Cross-classification analysis of dependent and independent variables by length of residence in Canada (in percentage otherwise noted)

	Native-born	Established immigrants	Recent immigrants
Self-rated oral health			
Good	86.1	79.6	88.5
Poor	13.9	20.4	11.5
Visible minority status			
White	93.0	44.6	14.3
South Asian	1.3	14.8	20.7
Black	1.2	7.8	8.4
Chinese	1.0	9.7	11.9
Filipino	0.4	5.1	16.9
Latin American	0.3	4.3	7.0
Southeast Asian	0.5	2.5	5.3
Middle Eastern	0.3	1.5	3.8
Other	2.0	9.7	11.7
Gender			
Women	51.5	50.9	51.8
Men	48.5	49.1	48.2
Marital status			
Married	48.9	67.4	61.1
Common-law	9.6	3.7	1.9
Widowed	4.7	6.8	1.1
Separated	2.6	3.5	0.9
Divorced	5.2	5.5	2.9
Never married	29.0	13.1	32.0
Household income adequacy			
Highest	55.9	44.7	27.8
Higher	26.8	31.8	35.9
Middle	13.0	18.0	26.3
Lower	3.0	3.9	4.6
Lowest	1.3	1.6	5.4

Employment status			
Full-time	56.3	44.3	57.0
Part-time	10.5	12.2	8.8
Not employed	33.2	43.5	34.2
Regular access to dental care			
At least once a year	75.3	71.8	59.9
Less than once a year	24.7	28.2	40.1
Perceived life stress			
Not at all	10.4	14.3	9.4
Not very	23.8	20.8	22.6
A bit	43.2	43.9	45.5
Quite a bit	19.0	15.9	19.2
Extremely	3.6	5.1	3.3
Life satisfaction			
Very satisfied	38.7	34.4	32.9
Satisfied	53.3	53.3	57.8
Neither/dissatisfied/very dissatisfied	8.0	12.3	9.3
Sense of belonging to community			
Very strong	17.3	21.6	15.3
Somewhat strong	49.0	48.4	49.1
Somewhat weak	25.0	23.8	22.8
Very weak	8.7	6.2	12.8
Type of smoker			
Not smoker	78.5	88.8	83.5
Daily smoker	16.5	8.6	10.9
Occasional smoker	5.0	2.6	5.6
Had alcohol in the past 12 months			
No	15.0	33.1	37.4
Yes	85.0	66.9	62.6
Frequency of physical activity			
Regular	70.5	58.3	51.5
Occasional	14.5	14.0	17.8
Infrequent	15.0	27.7	30.7
Daily fruit/vegetable consumption			

Less than 5 times	62.5	61.4	67.9
5-10 times a day	34.7	36.0	31.1
more 10 times a day	2.8	2.6	1.0
Frequency of brushing teeth			
At least twice a day	78.9	82.7	87.1
Less than twice a day	21.1	17.2	12.9
Age of respondents (mean)	46.0	54.2	35.5
Level of education			
Post-secondary education	59.9	60.1	70.1
Some post-secondary education	6.2	3.0	4.4
Secondary education	22.8	21.1	18.0
Less than secondary education	11.0	15.0	6.8
Self-rated physical health			
Good	87.7	83.5	94.4
Poor	12.3	16.5	5.6
Total	8,046,430	2,065,780	254,390

Data source: 2014 Canadian Community Health Survey

Table 2.2 Logit models predicting 'self-rated oral health' in Ontario, Canada

	Model 1	Model 2	Model 3	Model 4
	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Length of residence in Canada				
Native-born	1.00	1.00	1.00	1.00
Established immigrants	1.59 (0.155)***	1.35 (0.149)**	1.44 (0.165)**	1.44 (0.166)**
Recent immigrants	0.80 (0.167)	0.46 (0.134)**	0.47 (0.142)*	0.58 (0.173)
Visible minority status				
White		1.00	1.00	1.00
South Asian		0.82 (0.185)	0.82 (0.185)	0.91 (0.201)
Black		0.52 (0.155)*	0.54 (0.154)*	0.55 (0.162)*
Chinese		1.96 (0.466)**	2.09 (0.498)**	2.15 (0.503)**
Filipino		1.01 (0.501)	1.01 (0.505)	1.10 (0.574)
Latin American		0.74 (0.333)	0.85 (0.369)	0.95 (0.435)
Southeast Asian		2.18 (1.120)	2.44 (1.290)	2.61 (1.326)
Middle Eastern		1.69 (0.610)	1.68 (0.619)	1.98 (0.756)
Other		1.46 (0.383)	1.50 (0.394)	1.64 (0.420)
Gender				
Women		1.00	1.00	1.00
Men		1.46 (0.383)***	1.30 (0.122)**	1.24 (0.114)*
Marital status				
Married		1.00	1.00	1.00
Common-law		1.32 (0.208)	1.20 (0.196)	1.24 (0.203)
Widowed		1.05 (0.165)	1.05 (0.169)	0.92 (0.153)
Divorced		0.85 (0.148)	0.79 (0.144)	0.78 (0.146)
Never married		1.02 (0.179)	0.96 (0.174)	0.97 (0.187)
Common-law		0.85 (0.097)	0.86 (0.099)	0.95 (0.125)
Household income adequacy				
Highest		1.00	1.00	1.00
Higher		1.49 (0.162)***	1.37 (0.150)**	1.35 (0.149)**
Middle		1.97 (0.277)***	1.70 (0.235)***	1.62 (0.229)**

Lower	2.97 (0.734)***	2.38 (0.609)**	2.37 (0.563)***
Lowest	1.50 (0.363)	1.33 (0.324)	1.26 (0.309)
Employment status			
Full-time	1.00	1.00	1.00
Part-time	1.07 (0.181)	1.11 (0.192)	1.11 (0.190)
Not employed	1.39 (0.142)**	1.44 (0.150)***	1.11 (0.124)
Access to dental care			
At least once a year	1.00	1.00	1.00
Less than once a year	3.03 (0.282)***	2.64 (0.251)***	2.54 (0.241)***
Perceived life stress			
Not at all	1.00	1.00	1.00
Not very	0.94 (0.152)	0.97 (0.157)	0.95 (0.152)
A bit	1.30 (0.205)	1.30 (0.207)	1.26 (0.200)
Quite a bit	1.38 (0.245)	1.37 (0.244)	1.31 (0.231)
Extremely	1.39 (0.347)	1.20 (0.330)	1.05 (0.278)
Life satisfaction			
Very satisfied	1.00	1.00	1.00
Satisfied	1.55 (0.161)***	1.46 (0.151)***	1.36 (0.140)**
Neither/dissatisfied/very dissatisfied	2.92 (0.465)***	2.49 (0.407)***	1.65 (0.281)**
Sense of belonging to community			
Very strong	1.00	1.00	1.00
Somewhat strong	1.12 (0.153)	1.08 (0.145)	1.05 (0.142)
Somewhat weak	1.80 (0.260)***	1.70 (0.242)***	1.67 (0.240)***
Very weak	2.16 (0.407)***	1.92 (0.375)**	1.81 (0.343)**
Type of smoker			
Not smoker		1.00	1.00
Daily smoker		2.26 (0.248)***	2.15 (0.236)***
Occasional smoker		1.36 (0.290)	1.29 (0.292)
Had alcohol in the past 12 months			
No		1.00	1.00
Yes		0.82 (0.092)	0.92 (0.107)
Frequency of physical activity			

Regular			1.00	1.00
Occasional			1.34 (0.160)*	1.26 (0.150)*
Infrequent			1.45 (0.171)**	1.28 (0.152)*
Daily fruit/vegetable consumption				
Less than 5 times			1.00	1.00
5-10 times a day			0.88 (0.092)	0.87 (0.092)
more 10 times a day			1.07 (0.326)	1.07 (0.311)
Frequency of brushing teeth				
At least twice a day			1.00	1.00
Less than twice a day			1.32 (0.143)*	1.31 (0.140)*
Age of respondents				1.00 (0.003)
Level of education				
Post-secondary education				1.00
Some post-secondary education				1.57 (0.342)*
Secondary education				1.16 (0.133)
Less than secondary education				1.22 (0.151)
Self-rated physical health				
Good				1.00
Poor				3.05 (0.403)***
F test	11.98***	16.82***	15.15***	17.93***

*p<0.05. **p<0.01, ***p<0.001; OR for odds ratio; SE for standard error; Data source: 2014 Canadian Community Health Survey

Appendix 2.1 Summary of variables

Variables	Categories†
Self-rated oral health	0=Good oral health
	1=Poor oral health
Length of residence in Canada	0=Native-born
	1=Established immigrants
	2=Recent immigrants
Visible minority status	0=White
	1=South Asian
	2=Black
	3=Chinese
	4=Filipino
	5=Latin American
	6=Southeast Asian
	7=Middle Eastern
	8=Other
Gender	0=Women
	1=Men
Marital status	0=Married
	1=Common-law
	2=Widowed
	3=Separated
	4=Divorced
	5=Never married
Household income adequacy	0=Highest
	1=Higher
	2=Middle
	3=Lower
	4=Lowest
Employment status	0=Full-time
	1=Part-time
	2=Not employed
Access to dental care	0=At least once a year
	1=Less than once a year
Perceived life stress	0=Not at all

	1=Not very 2=A bit 3=Quite a bit 4=Extremely
Life satisfaction	0=Very satisfied 1=Satisfied 2=Neither/dissatisfied/very dissatisfied
Sense of belonging to community	0=Very strong 1=Somewhat strong 2=Somewhat weak 3=Very weak
Type of smoker	0=Not smoker 1=Daily smoker 2=Occasional smoker
Had alcohol in the past 12 months	0=No 1=Yes
Frequency of physical activity	0=Regular 1=Occasional 2=Infrequent
Daily fruit/vegetable consumption	0=Less than 5 times 1=5-10 times a day 2=More 10 times a day
Frequency of brushing teeth	0=At least twice a day 1=Less than twice a day
Age of respondents	Continuous variable
Level of education	0=Post-secondary education 1=Some post-secondary education 2=Secondary education 3=Less than secondary education
Self-rated physical health	0=Good physical health 1=Poor physical health

†Reference category coded as '0' for each variable

2.6 References

Abraido-Lanza, A. F., Chao, M. T., & Florez, K. R. (2005). Do healthy behaviors decline with greater acculturation?: Implications for the Latino mortality paradox. *Social Science & Medicine*, *61*(6), 1243-1255.

Adams, M. J. H., Young, M. S., Laird, L. D., Geltman, P. L., Cochran, M. J. J., Hassan, M. A., ... & Barnes, L. L. (2013). The cultural basis for oral health practices among Somali refugees pre-and post-resettlement in Massachusetts. *Journal of Health Care for the Poor and Underserved*, *24*(4), 1474-1485.

Amoyaw, J. A., & Abada, T. (2016). Does helping them benefit me? Examining the emotional cost and benefit of immigrants' pecuniary remittance behaviour in Canada. *Social Science & Medicine*, *153*, 182-192.

Batra, M., Tangade, P., Rajwar, Y. C., Dany, S. S., & Rajput, P. (2014). Social capital and oral health. *Journal of Clinical and Diagnostic Research*, *8*(9), ZE10-ZE11.

Beiser, M. (2005). The health of immigrants and refugees in Canada. *Canadian Journal of Public Health*, *96*(2), S30-S44.

Benyamini, Y., Leventhal, H., & Leventhal, E. A. (2004). Self-rated oral health as an independent predictor of self-rated general health, self-esteem and life satisfaction. *Social Science & Medicine*, *59*(5), 1109-1116.

Bhatti, T., Rana, Z., & Grootendorst, P. (2007). Dental insurance, income and the use of dental care in Canada. *Journal of Canadian Dental Association*, *73*(1), 57.

Borrell, L. N., Burt, B. A., & Taylor, G. W. (2005). Prevalence and trends in periodontitis in the USA: from the NHANES III to the NHANES, 1988 to 2000. *Journal of Dental Research*, *84*(10), 924-930.

Boyd, M., & Cao, X. (2009). Immigrant language proficiency, earnings, and language policies. *Canadian Studies in Population*, *36*(1-2), 63-86.

Buzdugan, R., & Halli, S. S. (2009). Labor Market Experiences of Canadian Immigrants with Focus on Foreign Education and Experience. *International Migration Review*, *43*(2), 366-386.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2014). Factors associated with unmet dental care needs in Canadian immigrants: an analysis of the longitudinal survey of immigrants to Canada. *BMC Oral Health*, *14*(1), 145.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2015). The deterioration of C anadian immigrants' oral health: analysis of the Longitudinal Survey of Immigrants to Canada. *Community Dentistry and Oral Epidemiology*, *43*(5), 424-432.

Cruz, G. D., Galvis, D. L., Kim, M., Le-Geros, R. Z., Barrow, S. Y. L., Tavares, M., & Bachiman, R. (2001). Self-perceived oral health among three subgroups of Asian-Americans in New York City: a preliminary study. *Community Dentistry and Oral Epidemiology*, *29*(2), 99-106.

Cruz, G. D., Shore, R., Le Geros, R. Z., & Tavares, M. (2004). Effect of acculturation on objective measures of oral health in Haitian immigrants in New York City. *Journal of Dental Research*, *83*(2), 180-184.

Dean, J. A., & Wilson, K. (2009). 'Education? It is irrelevant to my job now. It makes me very depressed…': exploring the health impacts of under/unemployment among highly skilled recent immigrants in Canada. *Ethnicity & Health*, *14*(2), 185-204.

De Maio, F. G. (2010). Immigration as pathogenic: a systematic review of the health of immigrants to Canada. *International Journal for Equity in Health*, *9*(1), 27.

Elani, H. W., Harper, S., Allison, P. J., Bedos, C., & Kaufman, J. S. (2012). Socio-economic inequalities and oral health in Canada and the United States. *Journal of Dental Research*, *91*(9), 865-870.

Finlayson, T. L., Williams, D. R., Siefert, K., Jackson, J. S., & Nowjack-Raymer, R. (2010). Oral health disparities and psychosocial correlates of self-rated oral health in the National Survey of American Life. *American Journal of Public Health*, *100*(S1), S246-S255.

Frisbie, W., Cho, Y., & 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., & Morissette, R. (2008). *Immigrants' education and required job skills*. Ottawa: Statistics Canada. Catalogue No. 75-001-X.

Gee, E. M. T., Kobayashi, K. M., & Prus, S. G. (2004). Examining the healthy immigrant effect in mid-to later life: findings from the Canadian Community Health Survey. *Canadian Journal on Aging*, *23*(5), S55-S63.

Ghiabi, E., Matthews, D. C., & Brillant, M. S. (2014). The oral health status of recent immigrants and refugees in Nova Scotia, Canada. *Journal of Immigrant and Minority Health*, *16*(1), 95-101.

Gilkinson, T., & Sauve, G. (2010). *Recent immigrants, earlier immigrants and the Canadian-born: Association with collective identities*. Research and Evaluation. Citizenship and Immigration Canada.

Haan, M. (2008). The place of place: Location and immigrant economic well-being in Canada. *Population Research and Policy Review*, *27*(6), 751-771.

Hagerty, B. M., Williams, R. A., Coyne, J. C., & Early, M. R. (1996). Sense of belonging and indicators of social and psychological functioning. *Archives of Psychiatric Nursing*, *10*(4), 235-244.

Hosmer, D., Lemeshow, S., & Sturdivant, R. (2013). *Applied Logistic Regression, 3rd edition*. New York, NY: John Wiley and Sons.

Hum, D., & Simpson, W. (2004). Economic integration of immigrants to Canada: A short survey. *Canadian Journal of Urban Research, 13*(1), 46-61.

Hira-Friesen, P. (2017). The effect of labour market characteristics on Canadian immigrant employment in precarious work, 2006-2012. *Canadian Journal of Urban Research, 26*(1), 1-15.

Jin, L. J., Lamster, I. B., Greenspan, J. S., Pitts, N. B., Scully, C., & Warnakulasuriya, S. (2016). Global burden of oral diseases: emerging concepts, management and interplay with systemic health. *Oral Diseases*, *22*(7), 609-619.

Kaida, L. (2013). Do host country education and language training help recent immigrants exit poverty? *Social Science Research*, *42*(3), 726-741.

Kobayashi, K. M., & Prus, S. G. (2012). Examining the gender, ethnicity, and age dimensions of the healthy immigrant effect: Factors in the development of equitable health policy. *International Journal for Equity in Health*, *11*(1), 8.

Lesser, I. A., Gasevic, D., & Lear, S. A. (2014). The association between acculturation and dietary patterns of South Asian immigrants. *PLoS One*, *9*(2), e88495.

Locker, D. (2009). Self-esteem and socioeconomic disparities in self-perceived oral health. *Journal of Public Health Dentistry*, *69*(1), 1-8.

Locker, D., Maggirias, J., & Wexler, E. (2009). What frames of reference underlie self-ratings of oral health?. *Journal of Public Health Dentistry*, *69*(2), 78-89.

Mariño, R., Stuart, G. W., Wright, F. C., Minas, I. H., & Klimidis, S. (2001). Acculturation and dental health among Vietnamese living in Melbourne, Australia. *Community Dentistry and Oral Epidemiology*, *29*(2), 107-119.

McGrath, C., & Bedi, R. (2002). Influences of social support on the oral health of older people in Britain. *Journal of Oral Rehabilitation*, *29*(10), 918-922.

Newbold, K. B. (2009). The short-term health of Canada's new immigrant arrivals: evidence from LSIC. *Ethnicity & Health, 14*(3), 315-336.

Ng, E., Wilkins, R., Gendron, F., & Berthelot, J. (2005). *Dynamics of immigrants' health in Canada: Evidence from the National Population Health Survey*. Ottawa: Statistics Canada. Catalogue No. 82-618-MWE2005002.

Pavalko, E., and Willson, A. (2011). Life course approaches to health, illness and healing. In B. Pescosolido, J. Martin, J. McLeod, & A. Rogers (Eds.),

Handbook of the Sociology of Health, Illness, and Healing (pp. 449-464). New York, NY: Springer.

Petersen, P. E. (2003). The World Oral Health Report 2003: continuous improvement of oral health in the 21st century–the approach of the WHO Global Oral Health Programme. *Community Dentistry and oral epidemiology*, *31*, 3-24.

Pérez, C. 2002. Health status and health behaviour among immigrants. *Health Reports* 13: 89-100.

Petersen, P. E., & Yamamoto, T. (2005). Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dentistry and Oral Epidemiology*, *33*(2), 81-92.

Ray, B., & Preston, V. (2013). Experiences of discrimination and discomfort: A comparison of metropolitan and non-metropolitan locations. *The Canadian Geographer*, *57*(2), 233-254.

Reitz, J. G., & Banerjee, R. (2009). Racial inequality and social cohesion. In J. G. Reitz, K. K. Breton, & K. L. Dion (Eds.), *Multiculturalism and social cohesion: Potentials and challenges of diversity* (pp.123-155). New York, NY: Springer.

Reitz, J. G., Curtis, J., & Elrick, J. (2014). Immigrant skill utilization: Trends and policy issues. *Journal of International Migration and Integration*, *15*(1), 1-26.

Reza, M., Amin, M. S., Sgro, A., Abdelaziz, A., Ito, D., Main, P., & Azarpazhooh, A. (2016). Oral health status of immigrant and refugee children in North America: a scoping review. *Journal of Canadian Dental Association*, *82*(g3).

Rubin, D. (1987). *Multiple Imputation for Nonresponse in Surveys*. New York, NY: John Wiley.

Sano, Y., Kaida, L., & Swiss, L. (2017). Earnings of Immigrants in Traditional and Non-Traditional Destinations: A Case Study from Atlantic Canada. *Journal of International Migration and Integration*, *18*(3), 961-980.

Sgan-Cohen, H. D., Steinberg, D., Zusman, S. P., & Sela, M. N. (1992). Dental caries and its determinants among recent immigrants from rural Ethiopia. *Community Dentistry and Oral Epidemiology*, *20*(6), 338-342.

Sheiham, A., & Watt, R. G. (2000). The common risk factor approach: a rational basis for promoting oral health. *Community Dentistry and Oral Epidemiology: Commentary*, *28*(6), 399-406.

Singhal, S., Mamdani, M., Mitchell, A., Tenenbaum, H., Lebovic, G., & Quiñonez, C. (2016). Dental treatment and employment outcomes among social assistance recipients in Ontario, Canada. *Health Policy*, *120*(10), 1202-1208.

Solar, O., & Irwin, A. (2010). *A conceptual framework for action on the social determinants of health*. Social determinants of health discussion paper 2 (policy and practice). Geneva, Switzerland: World Health Organization.

Vang, Z. M., Sigouin, J., Flenon, A., & Gagnon, A. (2017). Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. *Ethnicity & Health*, *22*(3), 209-241.

Veenstra, G. (2009). Racialized identity and health in Canada: results from a nationally representative survey. *Social Science & Medicine*, *69*(4), 538-542.

Wang, L., Rosenberg, M., & Lo, L. (2008). Ethnicity and utilization of family physicians: A case study of Mainland Chinese immigrants in Toronto, Canada. *Social Science & Medicine*, *67*(9), 1410-1422.

Watt, R. G. (2007). From victim blaming to upstream action: tackling the social determinants of oral health inequalities. *Community Dentistry and Oral Epidemiology*, *35*(1), 1-11.

Watt, R. G., & Sheiham, A. (2012). Integrating the common risk factor approach into a social determinants framework. *Community Dentistry and Oral Epidemiology*, *40*(4), 289-296.

World Health Organization. (2012). Oral health information sheet. Geneva, Switzerland: World Health Organization. http://www.who.int/oral_health/publications/factsheet. Accessed on August 27, 2018.

Wu, B., Plassman, B. L., Liang, J., Remle, R. C., Bai, L., & Crout, R. J. (2011). Differences in self-reported oral health among community-dwelling black, Hispanic, and white elders. *Journal of Aging and Health*, *23*(2), 267-288.

Zanchetta, M. S., & Poureslami, I. M. (2006). Health literacy within the reality of immigrants' culture and language. *Canadian Journal of Public Health*, *97*(Suppl 2): S26-S30.

Chapter 3

3. Unequal dental insurance coverage between immigrants and the native-born in Ontario, Canada

3.1 Introduction

Canada's publicly funded healthcare system provides universal health insurance, ensuring that 'all medically necessary care', including diagnostic, treatment, and preventive health care, is available for its citizens without direct charge (Health Canada, 2006). Universal health insurance enables Canada to provide social protections against health and financial risks to its citizens, particularly socially and economically vulnerable groups (Ruger, 2007). However, dental care is not considered 'medically necessary' in Canada. As a result, 56% and 38% of dental care is covered by private insurance and out-of-pocket payments respectively (CIHI, 2015).

Lack of universal dental insurance is problematic in many ways. For example, more than one-third of Canadians avoid dental care or decline recommended dental treatment due to financial barriers (Thompson et al., 2014). Lack of dental insurance coverage is also negatively associated with preventive dental care utilization, which is essential for optimal oral health through early detection and subsequent treatment of dental issues (Zangiabadi, Costanian & Tamim, 2017). This situation is concerning because oral health is essential to physical health. There are reciprocal relationships between periodontal diseases and many chronic diseases such as hypertension, diabetes, respiratory disease, coronary heart disease, and cardiovascular disease (Jin et al., 2016). According to the World Health Organization (2012), social, psychological, and economic well-being are all linked to oral health because it enables people to speak, smile, bite, chew, and kiss. Research also documents that economically disadvantaged households are at risk of incurring debt or compromising basic needs such as food to meet the cost of dental care (Muirhead et al., 2009; Wallace & MacEntee, 2012).

In this context, Canada is not able to mitigate such risks to the physical, social, psychological, and economic well-being for its citizens due to a lack of universal dental insurance coverage. Unfortunately, this disproportionately affects socially and

economically vulnerable groups with greater oral health risks and fewer available resources—including immigrants (Yamin & Norheim, 2014). Research shows that recent Canadian immigrants tend to underutilize dental care, including preventive dental care (Bedos et al., 2004; Calvasina, Muntaner & Quiñonez, 2014; Newbold & Patel, 2006). Consequently, the oral health of immigrants quickly deteriorates within two years of their arrival in Canada (Calvasina, Muntaner & Quiñonez, 2015). Similarly, recent immigrants to Canada are observed to have oral health advantage to their native-born counterparts, although their advantage disappears among established immigrants (Sano & Abada, 2018). Coupled with poor oral health, there may be negative economic consequences for paying for uninsured dental care services among immigrants and their families, who often face challenges to fully integrate into the mainstream labour market in Canada (Reitz, Curtis & Elrick, 2014).

Arguably, dental insurance is essential not only for dental care utilization and oral health, but also for people's physical, social, psychological, and economic well-being. Therefore, lack of dental insurance may be a major barrier to successful immigrant settlement in Canada. Despite this concern, the literature pays very little attention to dental insurance coverage among adult immigrants in Canada. Using the 2014 Canadian Community Health Survey, this study aims to address this void by comparing dental insurance coverage among recent immigrants, established immigrants, and the native-born in Ontario, Canada. Specifically, we examine 1) whether recent and established adult immigrants are differently covered by dental insurance than their native-born counterparts, and if so, 2) what factors might explain such disparities in dental insurance coverage.

3.2 Theoretical framework

The literature on health insurance is largely informed by economic approaches such as theories of rational choice and human capital. These approaches primarily document the role of labour market factors on employer-based health insurance coverage among full-time workers (Meyer & Pavalko, 1996; Montez, Angel & Angel, 2009). According to the rational choice approach, low-wage workers are expected to place little importance on employer-based health insurance because they prefer higher income over health insurance benefits (Enthoven & Fuchs, 2006). In addition, the

human capital approach suggests that individual types of human capital, such as education, job training, and job tenure, are critical determinants of health insurance coverage (Keene & Prokos, 2007). Economic approaches are often considered individualistic, arguing that individuals are rational actors who make choices as to whether they attain health insurance and develop their human capital.

Despite the frequent applications of economic approaches in the literature, they often overlook structural arguments to health insurance coverage. This observation is consistent with previous research (Blacksher, 2012; Ruger, 2007), suggesting that it is essential to understand that lack of health insurance coverage is a reflection of structural barriers faced by vulnerable groups in society. For example, there is little theoretical attention on health insurance attained by economically disadvantaged people such as part-time workers and unemployed people (Fronstin, 2007). Similarly, there are other sources of dental insurance other than employer-based coverage such as privately purchased and government-assisted dental insurance. This realization is important because such sources may be the only alternatives to being uninsured among economically disadvantaged people who do not have access to employer-based dental insurance (Meyer & Pavalko, 1996). Therefore, lack of theoretical attention to privately purchased and government-assisted dental insurance is a challenge to researchers and policymakers alike.

Given this background, we argue that there are structural barriers that potentially restrain recent and established immigrants from attaining dental insurance in Canada (Calvasina et al., 2018). Specifically, we draw a theoretical insight from the institutional framework of immigrant integration (Reitz, 1998). According to this framework, the economic integration of immigrants is shaped not only by the characteristics of immigrants themselves, but also by a wide range of institutional characteristics of the host society, including immigration policy, racial and ethnic relations, labour market structure, and the welfare system (Reitz, 1998, 2002). The following section aims to illustrate potential mechanisms in which recent and established immigrants are institutionally excluded from three types of dental insurance coverage—employer-based, privately purchased, and government-assisted dental insurance.

3.2.1 Immigrants' dental insurance coverage: An institutional approach

Canada introduced the 'points system' in 1967. Under this system, the majority of immigrants are recruited to Canada from non-European regions based on their human characteristics, such as age, education, host country language proficiency, and professional experiences (Akbari & MacDonald, 2014). As a result, more contemporary immigrants are documented to have high levels of human capital. Yet, research shows that some immigrants face challenges to their economic integration into the mainstream labour market, and these challenges include low income, precarious employment, poverty, and unemployment (Frank et al., 2013; Girard & Smith, 2013; Kazemipur & Halli, 2001). The literature points to several potential explanations for their economically disadvantaged position in Canada. For example, recent immigrants may lack job-related information and networks (Frank et al., 2013). Contemporary immigrants to Canada are also predominantly racial/ethnic minorities, potentially experiencing labour market racial discrimination (Li & Li, 2013; Oreopoulos & Dechief, 2011). Moreover, some recent immigrants face devaluation of foreign credentials, as the number of highly educated Canadians has rapidly increased over the last decade (Reitz et al., 2014). Interestingly, some cross-sectional and longitudinal studies show that the gaps in labour market outcomes between immigrants and the native-born Canadians reduce over time; however, significant disadvantages among long-term immigrants remain (Girard & Smith, 2013; Hum & Simpson, 2004).

Although some immigrants are observed to struggle economically in the host society, research finds that Canada's universal health insurance can minimize financial barriers to accessing health care among them (Setia et al., 2011; Siddiqi, Zuberi & Nguyen, 2009; Wu, Penning & Schimmele, 2005). Understanding health care access as a human right, publicly funded health care is a crucial social program that protects economically vulnerable groups by mitigating financial barriers to health care utilization (Yamin & Norheim, 2014). By contrast, dental care is not covered by universal health insurance, leaving dental care almost exclusively financed privately. Consequently, the Canadian Health Measures Survey shows that more than one-third of Canadians do not have any type of dental insurance (Health Canada, 2010).

Similarly, it is found that only 5% are covered by government-assisted dental insurance in Ontario, while 55% and 5% depend on employer-based and privately purchased dental insurance respectively. In this context, the dental care financing system seems to promote pro-rich distribution in Canada, treating dental insurance as a privilege and making dental care inaccessible to the poor (Leake & Birch, 2008).

Reflecting on the dominance of employer-based dental insurance in Canada, it is likely that some immigrants face economic barriers in attaining dental insurance for at least two reasons. For one, dental insurance is often provided as part of employee benefits. Thus, unemployment and precarious employment may be a major barrier to obtaining dental insurance among some immigrants and their families (see Cranford, Vosko & Zukewich, 2003; Quiñonez & Figueiredo, 2010). Specifically, research shows that immigrants are more likely to have jobs in smaller businesses that do not offer employee benefits (Noack & Vosko, 2011). This is a potential barrier to dental insurance coverage, as Kiil (2011) suggests that the size of business is positively associated with the chance of receiving employee benefits including health insurance. Low wage is also documented as a potential barrier. Studies indicate that some low-wage workers remain uninsured, even when eligible for employer-based coverage, because it allows them to achieve higher income, instead of health benefits, to cover other expenses (Abraham, Vogt & Gaynor, 2006; Royalty & Hagens, 2005). In this context, we posit that employer-based dental insurance is treated as a privilege in Canada, structurally excluding economically disadvantaged groups from attaining dental insurance. Therefore, low income, an indicator of lack of economic integration, may be a major factor that promotes some immigrants to opt out of employer-based dental insurance. Based on these arguments, we hypothesize that employer-based dental insurance is less attained among recent and established immigrants than among the native-born.

Although less common in Canada, privately purchased dental insurance may be important among some people to offset the loss of employer-based insurance. However, economic barriers to private purchase of dental insurance among some immigrants may persist. Specifically, Quiñonez and Figueiredo (2010) show that lack of employer-based coverage is often a reflection of unemployment and precarious employment, which often lead to limited financial resources at the household level. It

is also found that uninsured people tend to spend a large proportion of income to meet their daily needs such as food and housing, pointing out that private purchase of insurance is financially challenging among those without employer-based coverage (Levy & DeLeire, 2008). Because of economic constraints, recent immigrants may see other life challenges such as housing and child care costs to address as more pressing than health and health care (Woltman & Newbold, 2007). In this context, like employer-based one, purchasing private dental insurance—even less expensive plans with minimum dental coverage—may not be an affordable option for some immigrants. To this end, we hypothesize that privately purchased dental insurance is less attained among recent and established immigrants than among the native-born.

While the majority are covered by private insurance, government-assisted dental insurance is available to 6% of Canadians, primarily socially and economically vulnerable groups such as the disabled, Aboriginal groups, refugees, and social welfare recipients (Blomqvist & Woolley, 2018). In other words, the government considers dental care as a privilege, which is not accessible among some disadvantaged groups without special policy attentions. Despite evidence that immigrants are more likely to face labour market challenges than their native-born Canadians, immigrant status itself is not recognized as vulnerable in the context of dental care. Government-assisted dental insurance is not available to immigrants, except for newly arrived refugees and those who receive social welfare. Research shows that immigrants are less likely to participate in social welfare programs than their native-born counterparts (Smith-Carrier & Mitchell, 2015). The lack of recognition of their economically dire position in the dental care market may be an important structural barrier for some immigrants, preventing them from receiving government-assisted dental insurance. We hypothesize that government-assisted dental insurance is less attained among recent and established immigrants than among the native-born.

3.3 Data and analysis

We use data from the 2014 Canadian Community Health Survey (CCHS), in which three sampling frameworks (e.g., an area frame, a list frame, and a random digit dialing) were employed to obtain a representative sample of respondents aged 12 and

above from 10 provinces and three territories. The sampling frameworks excluded residents living on reserves, full-time members of the Canadian Forces, and the institutionalized populations. In the 2014 CCHS, Ontario and Nunavut were selected for content modules on oral health and its related behaviours. Given the small sample size of immigrants in Nunavut, we focus on Ontario residents. For this study, we limit the sample to those older than 18 years old. As missing cases are larger than 10% of the sample, the Markov chain Monte Carlo method is employed to address these missing cases. Based on Rubin's rules for scalar estimands (Rubin, 1987), we combine 10 imputed datasets and average them to obtain mean model parameter estimates. In the end, our weighted sample includes 8,046,430 native-born Ontarians, 2,065,780 established immigrants, and 254,390 recent immigrants.

3.3.1 Dependent variable

The dependent variable for this study is 'dental insurance coverage'. Respondents were asked whether they are covered by three types of dental insurance including government-assisted, privately purchased, and employer-based dental insurance. We use this question to construct our dependent variable (0=no insurance; 1=government-assisted; 2=privately purchased; 3=employer-based).

3.3.2 Independent and control variables

The focal independent variable is 'length of residence', measuring how long immigrants have been in Canada (0=native-born; 1=10 years or more (established immigrants); 2=less than 10 years (recent immigrants)). To capture immigrants' economic performance, we use two such indicators including household income adequacy (0=highest; 1=higher; 2=middle; 3=lower; 4=lowest) and employment status (0=full-time employed; 1=part-time employed; 2=self-employed; 3=unemployed). Based on previous research (Carrasquillo, Carrasquillo & Shea 2000; Ku & Matani, 2001), we further include six control variables to account for potential confounding factors such as visible minority status, gender, age of respondents, marital status, self-rated oral health, and level of education.

3.3.3 Statistical analysis

There are two separate analyses for this study. First, we employ the cross-classification analysis to understand the distributions of the dependent and independent variables by length of residence. Second, we employ the regression analysis to determine the relationship between dental insurance coverage and length of residence. Considering the polytomous nature of the dependent variable, we apply the multinomial logistic regression technique (Hosmer, Lemeshow & Sturdivantet, 2013). This technique generates a K-1 set of parameter estimates and compares different categories on the dependent variable to the base category. For this study, we treat 'no insurance' as the base category. For meaningful interpretations, we report findings with relative risk ratios (RRRs). RRRs larger than 1 imply higher chances of being covered by government-assisted, privately purchased, or employer-based dental insurance than being uninsured, while those smaller than 1 imply lower chances of being so. Results from the cross-classification analysis and multinomial logistic regression analysis were adjusted using sampling weights.

3.4 Results

3.4.1 Cross-classification analysis

Table 1 shows findings from the cross-classification analysis. We find that the larger proportion of recent (52%) and established immigrants (40%) do not have any type of dental insurance than the native-born (31%). Although privately purchased insurance is equally attained among the three groups (5%), both recent (3% and 40% respectively) and established immigrants (4% and 51% respectively) have lower rates of attaining government-assisted and employer-based insurance coverage than the native-born (6% and 58%). For economic factors, we find that fewer recent (28%) and established immigrants (45%) are in the highest category of the income adequate scale than the native-born (56%). At the same time, more recent immigrants (5%) belong to the lowest category in comparison to established immigrants (2%) and the native-born (1%). For employment status, however, recent immigrants and the native-born share a very similar pattern. Specifically, 47% and 48% of recent immigrants and the native-born are employed full-time respectively. By contrast, the more established

immigrants (43%) are not employed compared to recent immigrants (34%) and the native-born (33%).

3.4.2 Regression analysis

Findings from our regression analysis are shown in Table 2. We build models sequentially. Model 1 first examines the bivariate association between dental insurance coverage and length of residence in Canada. We find that both recent and established immigrants, compared to the native-born, have lower chances of obtaining government-assisted (RRR=0.31, $p<0.01$; RRR=0.53, $p<0.01$ for recent and established immigrants respectively), privately purchased (RRR=0.52, $p<0.05$; RRR=0.71, $p<0.1$ respectively), and employer-based dental insurance (RRR=0.40, $p<0.001$; RRR=0.67, $p<0.001$ respectively) than being uninsured. Findings remain largely consistent with the bivariate findings after including the control variables in Model 2, except that the differences between established immigrants and the native-born in privately purchased (RRR=0.79, $p>0.1$) and employer-based dental insurance (RRR=0.78, $p<0.01$) are further attenuated respectively. Model 3 further adjusts for economic characteristics. For government-assisted dental insurance, although the difference between established immigrants and the native-born remains consistent with Model 2, we observe that the difference between recent immigrants and the native-born widens when economic factors such as income adequate scale and employment status are considered (RRR=0.19, $p<0.001$). By contrast, for privately purchased dental insurance, the difference between recent immigrants and the native-born is fully explained when we control for economic characteristics, particularly income adequate scale (RRR=0.50, $p>0.05$). For employer-based dental insurance, we observe that established immigrants' lower coverage is fully explained by economic factors such as income adequate scale and employment status (RRR=0.84, $p>0.05$). However, the difference between recent immigrants and the native-born is only partially explained by income adequacy scale (RRR=0.33, $p<0.01$).

In addition to length of residence in Canada, several control variables are significantly associated with dental insurance coverage. For example, unmarried people are less likely to have employer-based dental insurance than married people (RRR=0.41, $p<0.001$). A one-year increase in age is also negatively associated with

having government-assisted (RRR=0.98, p<0.001) and employer-based dental insurance (RRR=0.98, p<0.001). Similarly, poor self-rated oral health is negatively associated with the odds of having privately purchased (RRR=0.57, p<0.01) and employer-based dental insurance (RRR=0.58, p<0.001). Moreover, respondents without secondary education are less likely to have privately purchased (RRR=0.27, p<0.01) and employer-based dental insurance (RRR=0.63, p<0.001) than those with post-secondary education. Although households with higher income adequacy generally report higher chances of having privately purchased and employer-based dental insurance, government-assisted dental insurance is more commonly attained among households with lower income adequacy. Part-time employment (RRR=0.44, p<0.001), self-employment (RRR=0.14, p<0.001), and unemployment (RRR=0.31, p<0.001) are negatively associated with employer-based dental insurance coverage. Unemployment on the other hand, is positively associated with government-assisted (RRR=2.31, p<0.001) and privately purchased dental insurance coverage (RRR=1.85, p<0.01).

3.5 Discussion and conclusions

Dental insurance is essential for ensuring people's physical, social, psychological, and economic well-being. However, as dental care is not part of publicly funded care, the lack of dental insurance is widely prevalent among Canadians, particularly economically disadvantaged populations. Although evidence suggests that immigrants often face labour market challenges in the host society, the literature rarely investigates the dental insurance coverage among recent and established immigrants. Framing dental insurance coverage as structurally determined, we address this void in the literature by asking whether recent and established immigrants are less likely to have government-assisted, privately purchased, and employer-based dental insurance than their native-born counterparts in Ontario, Canada.

The chance of having employer-based dental insurance among recent immigrants is observed to be lower than that of being uninsured, in comparison with the native-born. This difference is partly explained by household income adequacy. Our cross-classification analysis shows that recent immigrants have lower levels of household income adequacy. This result is consistent with our expectation that recent

immigrants often face barriers when it comes to integrating into the mainstream labour market (Reitz et al., 2014). This in turn poses a critical barrier in attaining employer-based dental insurance. Reflecting on their lower levels of household income adequacy, recent immigrants may be more likely than the native-born to opt out of employer-based dental insurance in favour of higher income over dental care benefits (Abraham et al., 2006; Royalty & Hagens, 2005).

It is noteworthy, however, that the significant disparity in employer-based dental insurance coverage between recent immigrants and the native-born remains significant after controlling for economic factors. There are at least two possible explanations for this. For one, there may be an unobserved labour market characteristic that is impacting employer-based dental insurance coverage. Specifically, employment in large firms and public sector is beneficial in receiving employer-based health insurance (Montez et al., 2009). Yet, Noack and Vosko (2011) find a large proportion of recent immigrants working in small firms that do not provide any employee benefits in Canada. Also, lack of oral health-related knowledge may be another factor that explains this disparity. Specifically, many low- and middle-income countries in Africa, Asia, and Latin America lack a basic dental care infrastructure (Petersen et al., 2005). Considering that many recent immigrants come to Canada from such countries, a lack of comprehensive knowledge about oral health and dental care utilization may cause them to opt out of employer-based dental insurance.

We find that established immigrants' lower employer-based dental insurance coverage is completely explained by economic factors, including employment status and household income adequacy. It is noteworthy that our cross-classification analysis shows that more established immigrants are unemployed and have lower levels of household income adequacy than the native-born. This may point to their lack of economic integration as a barrier to attaining employer-based dental insurance among immigrants, even after 10 years of residence in Canada. Indeed, some studies suggest that it is difficult for immigrants to achieve full economic integration into the mainstream labour market regardless of length of residence in Canada (Hum & Simpson, 2004; Kaushal et al., 2016). We acknowledge that it is difficult for us to identify the source of their economic vulnerabilities in this study, due to the cross-

sectional nature of the CCHS. Specifically, we are not tracking the same individuals over time. Therefore, it is possible that the labour market challenges of established immigrants may be linked to the cohort effect, rather than the duration of stay effect, as earlier cohorts of immigrants are documented to have lower levels of human capital (Green & Green, 2004). Nonetheless, our analysis raises the possibility that established immigrants lack employer-based dental insurance coverage due to their economic position in the host society.

We also observe that the chance of purchasing private dental insurance is lower than that of being uninsured among recent and established immigrants, compared with the native-born. For recent immigrants, this difference is completely explained by household income adequacy, indicating that privately purchased dental insurance may not serve as the alternative to being uninsured because of the economic difficulties that they face. This finding lends support to the affordability issue among recent immigrants (Levy & DeLeire, 2008; Quiñonez & Figueiredo, 2010). Health insurance may not necessarily be the priority among poorer households, as they have other basic needs such as food and housing that must be met. Recent immigrants may prioritize more important life events than oral health and dental care utilization (Woltman & Newbold, 2007). Thus, it may not be appropriate for policymakers to assume that recent immigrants are privately purchasing dental insurance as a means of offsetting the loss of employer-based insurance.

We find that the chance of having government-assisted dental insurance is lower than that of being uninsured among recent and established immigrants, compared with their native-born counterparts. Importantly, such disparities are not explained by economic factors including employment status and household income adequacy. Based on these results, we argue that government-assisted dental insurance may not effectively provide the financial means to secure dental care among immigrants. In Ontario, some adult populations, such as the unemployed and disabled populations, are recognized as financially vulnerable for the purposes of dental care utilization. Hence, they are eligible for dental insurance through the Ontario Works and the Ontario Disability Support Program (Adams et al., 2017). At the national level, social welfare recipients can receive dental insurance. However, research shows that immigrants are less likely to receive social welfare than the native-born

Canadians (Smith-Carrier & Mitchell, 2015). Consistent with our expectation, recent and established immigrants may be structurally restricted from attaining government-assisted dental insurance, even with their lower rates of employer-based and privately purchased dental insurance coverage.

There are several implications for this study. Universal health insurance is a useful approach to removing financial barriers to health care utilization, especially among socially and economically vulnerable populations. As we find that recent and established immigrants have lower rates of dental insurance coverage, the implementation of universal dental insurance may promote regular access to dental care among this population. Considering the reciprocal linkage between periodontal diseases and many chronic diseases, it may be useful to consider the inclusion of dental care as part of the universal publicly funded health care system. Alternatively, if dental care is to remain individually and privately managed, it must be recognized that the disparity in dental insurance coverage exists between immigrants and the native-born. Thus, we recommend that policymakers work towards addressing the economic disadvantages among immigrants, such as low income, precarious employment, and unemployment, a move that may increase their uptake of dental insurance. In addition to economic barriers, it is possible that immigrants, particularly recent immigrants, lack adequate knowledge about oral health, including the dental insurance system of Canada. It may be helpful for policymakers to establish a program that educates them about oral health.

There are some limitations to this study. As mentioned above, we use a cross-sectional survey. Although it is ideal to use a longitudinal survey that allows us to capture dental insurance coverage of the same respondents over time, there are very few datasets like that in Canada. The CCHS also does not have any variable that captures oral health knowledge. Moreover, the CCHS does not collect information on oral health in all the provinces. As the literature suggests that immigrants integrate into the dominant society differently in gateway destinations such as Ontario than in non-gateway destinations such as the Prairies or Atlantic Canada (Haan, 2008; Ray & Preston, 2013; Sano, Kaida & Swiss, 2017), it is important to examine whether similar patterns can be observed at the national level. These limitations highlight the need to

collect a comprehensive longitudinal survey on oral health-related information, including dental insurance coverage, in Canada.

Table 3.1 Cross-classification analysis of dependent and independent variables by length of residence in Canada (in percentage unless otherwise noted)

	Native-born	Established	Recent
Dental insurance coverage			
No insurance	31	40	52
Government-assisted	6	4	3
Privately purchased	5	5	5
Employer-based	58	51	40
Visible minority status			
White	93	45	14
South Asian	1	15	21
Black	1	8	8
Chinese	1	10	12
Other	4	22	45
Gender			
Women	52	51	52
Men	48	49	48
Marital status			
Married	57	70	63
Unmarried	43	30	37
Age of respondents†	46	54	36
Self-rated oral health			
Good	88	84	94
Poor	12	16	6
Level of education			
Post-secondary	60	60	70
Some post-secondary	6	3	4
Secondary	23	21	18
Less than secondary	11	16	7
Income adequate scale			
Highest	56	45	28
Higher	27	32	36
Middle	13	18	26
Lower	3	4	5
Lowest	1	2	5
Employment status			
Full-time employed	48	40	47
Part-time employed	9	5	10
Self-employed	10	12	9
Not employed	33	43	34
Weighted Ns	8,046,430	2,065,780	254,390

†Mean scores reported; Data source: 2014 Canadian Community Health Survey

Table 3.2 Multinomial logit models of 'dental insurance coverage' in Ontario, Canada

	Model 1			Model 2			Model 3		
	GA	PP	EB	GA	PP	EB	GA	PP	EB
Length of residence									
Native-born	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Established immigrants	0.53**	0.71†	0.67***	0.57**	0.79	0.78**	0.54**	0.83	0.84
Recent immigrants	0.31**	0.52*	0.40***	0.22**	0.45*	0.25***	0.19***	0.50	0.33**
Visible minority status									
White				1.00	1.00	1.00	1.00	1.00	1.00
South Asian				1.04	1.06	0.93	0.95	1.19	1.32
Black				1.80	0.72	1.22	1.61	0.84	1.28
Chinese				0.97	1.20	0.78	0.99	1.08	0.82
Other				1.38	0.78	0.86	1.20	0.82	0.97
Gender									
Women				1.00	1.00	1.00	1.00	1.00	1.00
Men				1.02	0.86	1.02	1.27	0.91	0.91
Marital status									
Married				1.00	1.00	1.00	1.00	1.00	1.00
Unmarried				1.11	0.83	0.34***	0.87	0.89	0.41***
Age of respondents†				0.98***	1.00	0.97***	0.98***	0.99	0.98***
Self-rated oral health									
Good				1.00	1.00	1.00	1.00	1.00	1.00
Poor				1.22	0.49***	0.46***	1.05	0.57**	0.58***
Level of education									
Post-secondary				1.00	1.00	1.00	1.00	1.00	1.00
Some post-secondary				0.98	1.17	0.71*	0.75	1.00	1.02
Secondary education				1.35	0.53***	0.69***	1.10	0.56**	0.95
Less than secondary				1.42*	0.22***	0.35***	0.96	0.27***	0.63***
Income adequate scale									
Highest							1.00	1.00	1.00
Higher							0.57**	0.57***	0.46***
Middle							0.84	0.30***	0.21***

Lower	2.18**	0.23**	0.09***
Lowest	2.43**	0.97	0.25***
Employment status			
Full-time employed	1.00	1.00	1.00
Part-time employed	1.17	2.22**	0.44***
Self-employed	0.26***	1.03	0.14***
Not employed	2.31***	1.85**	0.31***

Bivariate in Model 1, Model 1+controls in Model 2, Model 2+economic characteristics in Model 3; GA=government-assisted, PP=privately purchased, EB=employer-based; †p<0.1, *p<0.05, **p<0.01, ***p<0.001; Model 1 F=9.60***, Mode 2 F=23.08***, Model 3 F=29.37***; Data source: 2014 Canadian Community Health Survey

Appendix 3.1 Summary of variables

Variables	Categories†
Dental insurance coverage	0=No dental insurance
	1=Government-assisted dental insurance
	2=Privately purchased dental insurance
	3=Employer-based dental insurance
Length of residence in Canada	0=Native-born
	1=Established immigrants
	2=Recent immigrants
Visible minority status	0=White
	1=South Asian
	2=Black
	3=Chinese
	4=Other
Gender	0=Women
	1=Men
Marital status	0=Married
	1=Unmarried
Age of respondents	Continuous variable
Self-rated oral health	0=Good oral health
	1=Poor oral health
Level of education	0=Post-secondary education
	1=Some post-secondary education
	2=Secondary education
	3=Less than secondary education
Household income adequacy	0=Highest
	1=Higher
	2=Middle
	3=Lower
	4=Lowest
Employment status	0=Full-time
	1=Part-time
	2=Not employed

†Reference category coded as '0' for each variable

3.6 References

Abraham, J. M., Vogt, W. B., & Gaynor, M. S. (2006). How do households choose their employer-based health insurance? *INQUIRY*, *43*(4), 315-332.

Adams, A., Yarascavitch, C., Quiñonez, C., & Azarpazhooh, A. (2017). Use of and Access to Deep Sedation and General Anesthesia for Dental Patients: A Survey of Ontario Dentists. *Journal of Canadian Dental Association*, *83*(h4).

Akbari, A. H., & MacDonald, M. (2014). Immigration policy in Australia, Canada, New Zealand, and the United States: An overview of recent trends. *International Migration Review*, *48*(3), 801-822.

Bedos, C., Brodeur, M., Benigeri, M., & Olivier, M. (2004). Utilization of preventive dental services by recent immigrants in Quebec. *Canadian Journal of Public Health, 95*(3), 219–223.

Blacksher, E. (2012). Redistribution and recognition: Pursuing social justice in public health. *Cambridge Quarterly of Healthcare Ethics*, *21*(3), 320-331.

Blomqvist, A., & Woolley, F. (2018). *Filling the Cavities: Improving the Efficiency and Equity of Canada's Dental Care System*. C.D. Howe Institute Commentary 510. Toronto, ON: C.D. Howe Institute.

Calvasina, P., Gastaldo, D., Quiñonez, C., & Muntaner, C. (2018). Developing a Research Agenda on the Political Economy of Immigrants' Oral Health. *Journal of Immigrant and Minority Health, 20*(3), 759-761.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2014). Factors associated with unmet dental care needs in Canadian immigrants: an analysis of the longitudinal survey of immigrants to Canada. *BMC Oral Health*, *14*(1), 145.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2015). The deterioration of Canadian immigrants' oral health: analysis of the Longitudinal Survey of Immigrants to Canada. *Community Dentistry and Oral Epidemiology*, *43*(5), 424-432.

Carrasquillo, O., Carrasquillo, A. I., & Shea, S. (2000). Health insurance coverage of immigrants living in the United States: differences by citizenship status and country of origin. *American Journal of Public Health*, *90*(6), 917-923.

CIHI. (2015). *National Health Expenditure Trends, 1975 to 2015*. Toronto, ON: CIHI. https://secure.cihi.ca/free_products/nhex_trends_narrative_report_2015_en.pdf. Accessed on August 28, 2018.

Cranford, C. J., Vosko, L. F., & Zukewich, N. (2003). Precarious employment in the Canadian labour market: A statistical portrait. *Just labour*, *3*(fall), 6-22.

Enthoven, A. C., & Fuchs, V. R. (2006). Employment-based health insurance: Past, present, and future. *Health Affairs*, *25*(6), 1538-1547.

Frank, K., Phythian, K., Walters, D., & Anisef, P. (2013). Understanding the economic integration of immigrants: A wage decomposition of the earnings disparities between native-born Canadians and recent immigrant cohorts. *Social Sciences*, *2*(2), 40-61.

Fronstin, P. (2007). *The Future of Employment-Based Health Benefits: Have Employers Reached a Tipping Point?* Issue Brief No. 312. Washington, D.C.: Employee Benefit Research Institute.

Girard, M., & Smith, M. (2013). Working in a regulated occupation in Canada: An immigrant-native born comparison. *Journal of International Migration and Integration*, *14*(2), 219-244.

Green, A. G., & Green, D. (2004). The goals of Canada's immigration policy: A historical perspective. *Canadian Journal of Urban Research*, *13*(1), 102-139.

Haan, M. (2008). The place of place: Location and immigrant economic well-being in Canada. *Population Research and Policy Review*, *27*(6), 751-771.

Health Canada. (2006). *2006 Canada Health Act: Annual Report 2005–2006*. Ottawa, ON: Health Canada. http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/chaar-ralcs-0506/chaar-ralcs-0506_e.pdf. Accessed on August 28, 2018.

Hum, D., & Simpson, W. (2004). Economic integration of immigrants to Canada: A short survey. *Canadian Journal of Urban Research*, *13*(1), 46-61.

Hosmer, D., Lemeshow, S., & Sturdivant, R. (2013). *Applied Logistic Regression, 3rd edition*. New York, NY: John Wiley and Sons.

Jin, L. J., Lamster, I. B., Greenspan, J. S., Pitts, N. B., Scully, C., & Warnakulasuriya, S. (2016). Global burden of oral diseases: emerging concepts, management and interplay with systemic health. *Oral Diseases*, *22*(7), 609-619.

Kazemipur, A., & Halli, S. S. (2001). The changing colour of poverty in Canada. *Canadian Review of Sociology*, *38*(2), 217-238.

Kaushal, N., Lu, Y., Denier, N., Wang, J. S. H., & Trejo, S. J. (2016). Immigrant employment and earnings growth in Canada and the USA: evidence from longitudinal data. *Journal of Population Economics*, *29*(4), 1249-1277.

Keene, J. R., & Prokos, A. H. (2007). Comparing Offers and Take-ups of Employee Health Insurance across Race, Gender, and Decade. *Sociological Inquiry*, *77*(3), 425-459.

Kiil, A. (2011). Determinants of employment-based private health insurance coverage in Denmark. *Nordic Journal of Health Economics*, *1*(1), 29-60.

Ku, L., & Matani, S. (2001). Left out: immigrants' access to health care and insurance. *Health Affairs*, *20*(1), 247-256.

Leake, J. L., & Birch, S. (2008). Public policy and the market for dental services. *Community Dentistry and Oral Epidemiology*, *36*(4), 287-295.

Levy, H., & DeLeire, T. (2008). What do people buy when they don't buy health insurance and what does that say about why they are uninsured? INQUIRY, *45*(4), 365-379.

Li, P. S., & Li, E. X. (2013). Decomposing immigrants' economic integration in earnings disparity: Racial variations in unexpected returns. *Canadian Ethnic Studies*, *45*(3), 81-94.

Meyer, M. H., & Pavalko, E. K. (1996). Family, work, and access to health insurance among mature women. *Journal of Health and Social Behavior*, *37*(4), 311-325.

Montez, J. K., Angel, J. L., & Angel, R. J. (2009). Employment, marriage, and inequality in health insurance for Mexican-origin women. *Journal of Health and Social Behavior*, *50*(2), 132-148.

Muirhead, V. E., Quinonez, C., Figueiredo, R., & Locker, D. (2009). Predictors of dental care utilization among working poor Canadians. *Community Dentistry and Oral Epidemiology*, *37*(3), 199-208.

Newbold, K. B., & Patel, A. (2006). Use of dental services by immigrant Canadians. *Journal of the Canadian Dental Association*, *72*(2), 143.

Noack, A. M., & Vosko, L. F. (2011). *Precarious jobs in Ontario: Mapping dimensions of labour market insecurity by workers' social location and context*. Toronto: Law Commission of Ontario.

Oreopoulos, P., & Dechief, D. (2011). *Why do some employers prefer to interview Matthew, but not Samir? New Evidence from Toronto, Montreal, and* Vancouver. Centre of Excellence for Research on Immigration and Diversity, Working Paper Series 11, no. 13, Metropolis British Columbia.

Petersen, P. E., Bourgeois, D., Ogawa, H., Estupinan-Day, S., & Ndiaye, C. (2005). The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization, 83*(9), 661-669.

Quiñonez, C., & Figueiredo, R. (2010). Sorry doctor, I can't afford the root canal, I have a job: Canadian dental care policy and the working poor. *Canadian Journal of Public Health*, *101*(6), 481-485.

Ray, B., & Preston, V. (2013). Experiences of discrimination and discomfort: A comparison of metropolitan and non-metropolitan locations. *The Canadian Geographer, 57*(2), 233-254.

Reitz, J. G. (1998). *Warmth of the Welcome: The Social Causes of Economic Success for Immigrants in Different Nations and Cities*. Boulder, CO: Westview Press.

Reitz, J. G. (2002). Host societies and the reception of immigrants: research themes, emerging theories and methodological issues. *International Migration Review*, *36*(4), 1005-1019.

Reitz, J. G., Curtis, J., & Elrick, J. (2014). Immigrant skill utilization: Trends and policy issues. *Journal of International Migration and Integration*, *15*(1), 1-26.

Rubin, D. (1987). *Multiple Imputation for Nonresponse in Surveys*. New York, NY: John Wiley.

Ruger, J. P. (2007). The moral foundations of health insurance. *Journal of the Association of Physicians*, *100*(1), 53-57.

Royalty, A. B., & Hagens, J. (2005). The effect of premiums on the decision to participate in health insurance and other fringe benefits offered by the employer: evidence from a real-world experiment. *Journal of Health Economics*, *24*(1), 95-112.

Sano, Y., & Abada, T. (2017). Immigration as a social determinant of oral health in Ontario, Canada. Presented at the Canadian Population Society Annual Meeting. Regina, SK.

Sano, Y., Kaida, L., & Swiss, L. (2017). Earnings of Immigrants in Traditional and Non-Traditional Destinations: A Case Study from Atlantic Canada. *Journal of International Migration and Integration*, *18*(3), 961-980.

Setia, M. S., Quesnel-Vallee, A., Abrahamowicz, M., Tousignant, P., & Lynch, J. (2011). Access to health-care in Canadian immigrants: a longitudinal study of the National Population Health Survey. *Health & Social Care in the Community*, *19*(1), 70-79.

Siddiqi, A., Zuberi, D., & Nguyen, Q. C. (2009). The role of health insurance in explaining immigrant versus non-immigrant disparities in access to health care:

Comparing the United States to Canada. *Social Science & Medicine*, *69*(10), 1452-1459.

Smith-Carrier, T., & Mitchell, J. (2015). Immigrants on social assistance in Canada: Who are they and why are they there? In D. Béland & P-M. Daigneault (Eds.), *Welfare reform in Canada: Provincial social assistance in comparative perspective*. (pp. 305-322). Toronto, ON: University of Toronto Press.

Thompson, B., Cooney, P., Lawrence, H., Ravaghi, V., & Quiñonez, C. (2014). Cost as a barrier to accessing dental care: findings from a Canadian population-based study. *Journal of Public Health Dentistry*, *74*(3), 210-218.

Wallace, B. B., & MacEntee, M. I. (2012). Access to dental care for low-income adults: perceptions of affordability, availability and acceptability. *Journal of Community Health*, *37*(1), 32-39.

Woltman, K. J., & Newbold, K. B. (2007). Immigrant women and cervical cancer screening uptake: a multilevel analysis. *Canadian Journal of Public Health*, *98*(6), 470-475.

World Health Organization. (2012). Oral health information sheet. Geneva, Switzerland: World Health Organization. http://www.who.int/oral_health/publications/factsheet. Accessed on August 27, 2018.

Wu, Z., Penning, M. J., & Schimmele, C. M. (2005). Immigrant status and unmet health care needs. *Canadian Journal of Public Health*, *96*(5), 369-373.

Yamin, A. E., & Norheim, O. F. (2014). Taking equality seriously: applying human rights frameworks to priority setting in health. *Human Rights Quarterly*, *36*(2), 296-324.

Zangiabadi, S., Costanian, C., & Tamim, H. (2017). Dental care use in Ontario: the Canadian community health survey (CCHS). *BMC Oral Health*, *17*(1), 165.

Chapter 4

4. The relationship between preventive dental care utilization and immigrant source region among immigrants newly arrived in Canada: Modifying Andersen's behavioural model of health care utilization

4.1 Introduction

The 'healthy immigrant effect', whereby immigrants have better physical and mental health than the native-born at the time of arrival, is widely observed in Canada. However, this health advantage often disappears within five to 10 years after arrival (De Maio, 2010; Vang et al., 2017). Although the mechanism is complex, immigrants' limited use of primary and preventive health care, including the use of family physicians, maternity health care, cancer screening, and mental health care, is considered an important cause of their declining health (Beiser, 2005; Newbold, 2005; Batista et al., 2018).

One aspect of health care relatively unacknowledged by the literature is preventive dental care. Studies in Canada and elsewhere show that preventive dental care leads to better oral health (Aldossary, Harrison & Bernabé, 2015; Health Canada, 2010) through early detection and the subsequent timely treatment of dental issues, especially as these are often preventable with relatively simple and proven modalities (Locker, Maggirias & Quiñonez, 2011). According to Gilbert, Duncan, and Shelton (2003), a lack of regular dental care can lead to tooth removal, as seeking dental care in response to a specific dental issue often delays treatment. Recognizing its importance, the Canadian Dental Association recommends at least one dental visit a year for preventive purposes, depending on individual oral health needs (Ubelacker, 2015).

A few studies find recent immigrants make limited use of dental care in Canada. For example, recent female immigrants in Quebec are less likely to use preventive dental care than their native-born counterparts (Bedos et al., 2004). Newbold and Patel (2006) also find that very recent immigrants have lower rates of dental care utilization than

established immigrants. Research also shows that about 30% of very recent immigrants report their dental needs are unmet (Calvasina, Muntaner & Quiñonez, 2014). These findings are alarming because the oral health of adult immigrants deteriorates as quickly as two years after their arrival in Canada (Calvasina, Muntaner & Quiñonez, 2015). In fact, established immigrants have poorer oral health than the native-born in Ontario (Sano & Abada, 2018).

This study addresses three voids in the literature. First, little is known about adult immigrants' utilization of preventive dental care in Canada, as most studies focus on immigrant children (see Reza et al., 2016). Second, studies often aggregate recent immigrants by combining those who have been in Canada for less than 10 years, largely due to the lack of available data (De Maio, 2010; Vang et al., 2017). However, it is crucial to understand immigrants' preventive dental care within the first few years of arrival, as these years seem to serve as an important period for explaining their declining oral health. Third, the relationship between health care utilization and immigrant source region is rarely explored in Canada, even though immigrants come from many world regions (Khan et al., 2017). Considering that recent immigrants from non-European regions face a wide range of social, cultural, and economic issues (Reitz & Banerjee, 2009), it is curious that so little is known about the role of immigrant source region on health care utilization, including dental care. The Longitudinal Survey of Immigrants to Canada, which tracks immigrants for four years after their arrival, provides a unique opportunity to address these issues. To this end, this study explores the relationship between preventive dental care utilization and immigrant source region among newly arrived adult immigrants in Canada.

4.2 Andersen's behavioural model of health care utilization

We use Andersen's model as a conceptual framework. The framework suggests an individual's heath care utilization is determined by three clusters of factors: need, enabling, and predisposing clusters (Andersen, 1995). In the need cluster, perceived and/or evaluated health status is influential to health care utilization. There is an element of choice involved in need, and the framework distinguishes between discretionary and

non-discretionary health care utilization, with the latter referring to a lack of choice triggered by severe health conditions (see Wu et al., 2013).

The enabling cluster is linked to economic, social, and community resources that make health care accessible to people, such as income, health insurance, social resources, and available health personnel and facilities. Income is a key factor in dental care, with low income Canadians facing financial barriers to dental care utilization (Thompson et al., 2014). Social resources, often conceptualized as social capital, are another factor. Social capital represents resources derived from a person's networks and the quality of his or her relationships (Putnam, 2000). Active participation in networks and relationships can serve as a platform for exchanging information about dental care (Batra et al., 2014). Research shows that social capital measurements, such as social interactions and participation, are positively correlated with dental care utilization (Burr & Lee, 2013). It is also important to understand that health care is only accessible when health personnel and facilities are available in places where people live and work. Research shows that the density of and distance to dental clinics correlate with regular dental visits (Aida et al., 2011).

The predisposing cluster includes demographic and social structure characteristics. Demographic factors such as age and gender can influence health status, as can factors relevant to social structure, such as education, employment, marital status, and place of residence. Andersen (1995) argues that the role of the predisposing cluster in health care utilization is indirect, reflecting differences in available resources and health status. Different levels of social, economic, and community resources are variably available, depending on a person's position in the social hierarchy. For example, socioeconomic status, expressed in terms of education and employment, is known to shape health behaviours through money, knowledge, prestige, power, and beneficial social connections (Link & Phelan, 1995). Thus, it is not surprising that education and employment are associated with dental care utilization in Canada (Locker et al., 2011). Marriage is another social factor known to promote healthy behaviours because married people's health behaviours are monitored and shaped by their spouses, often with emotional support (Miller & Dimatteo, 2013). Finally, healthcare facilities are not equally

available in all provinces, with some, like Newfoundland and Saskatchewan, lagging behind; as a result, geographical disparities in healthcare utilization persist in Canada (Wilson & Rosenberg, 2002).

4.3 Immigrant source region and preventive dental care utilization in Canada: The institutional approach to immigrant integration

Despite its popularity, Andersen's model has been criticized for its lack of recognition of structural barriers to health care utilization among minority and vulnerable populations, such as the homeless, drug and alcohol abusers, and immigrants (Gelberg, Andersen & Leake, 2000). With respect to the latter, although previous studies show immigrant integration is an important predictor of health care utilization, there is little effort to systematically conceptualize its role (see Choi, 2011; Yang & Hwang, 2016). According to Reitz (1998), immigrant integration is a function not only of the characteristics of immigrants themselves, but also of the institutional characteristics of the host society, such as immigration policy, labour market structure, educational system, pre-existing ethnic and racial relations, and welfare regime. Through this institutional approach, we frame immigrant source region as a predisposing factor and expect that its role on preventive dental care utilization is explained by different social, cultural, linguistic, and economic integration patterns between non-European and European immigrants newly arrived in Canada.

Canada's immigrant recruitment used to be racially discriminatory, with preference given to white immigrants from Europe. In 1967, however, Canada implemented its 'points system' to recruit immigrants based on human capital characteristics, such as age, education, occupational skills, and proficiency in English or French. This is considered reflective of the change in industrial structure from a factory-based to a knowledge-based economy in Canada and other developed nations. Specifically, it was considered important for Canada to increase the level of human capital at the national level to maintain its international economic competitiveness

(Akbari & MacDonald, 2014). As a result, Canada recruited immigrants with high levels of human capital from non-European regions, such as Asia, Latin America, the Caribbean, and Africa. Consequently, a large proportion of recently arrived immigrants represent visible minorities.

Research shows that visible minority recent immigrants, despite their high skill status, face the prospect of poverty, low income, precarious employment, and even unemployment (Kazemipur & Halli, 2001; Nakhaie & Kazemipur, 2013). Human capital does not necessarily translate into economic success for several reasons. For one thing, accreditation requirements are based on Canadian educational/occupational systems, thus posing problems for those trained elsewhere (Bauder, 2003). For another, as the number of highly educated people has increased in Canada since the 1970s, employers in today's labour market have a large pool of skilled workers to draw from; employers may choose native-born candidates over equally skilled immigrant candidates because of personal prejudice toward or unfamiliarity with foreign educational/occupational systems (Reitz, 2001). Importantly, research shows the devaluation of foreign credentials is particularly salient among visible minority immigrants from less developed regions (Buzdugan & Halli, 2009). Non-European immigrants may also be exposed to labour market racial discrimination; Oreopoulos and Dechief (2011) find that callback rates for job applications are lower for those with Indian and Chinese names than European names in Montreal, Toronto, and Vancouver. Previous studies also find that visible minority immigrants have lower earnings than their white counterparts, even after accounting for social and human capital factors (Nakhaie & Kazemipur, 2013).

Given the economic vulnerabilities of non-European immigrants, social welfare programs, including health care, may be critical for their successful settlement in Canada. Recognizing health as a human right, Canada's publicly funded health care system ensures that 'all medically necessary care', including diagnostic, treatment, and preventive health care, is available for its citizens without direct charge (Health Canada, 2006). Unfortunately, at this point, dental care is not covered by the publicly funded system; 56% and 38% of dental care are covered by private insurance and out-of-pocket payments respectively (CIHI, 2015). Not surprisingly, many Canadians cannot afford

dental care (Thompson et al., 2014). Publicly funded dental care is available to certain economically and socially vulnerable groups, including the Aboriginal population, people with disabilities, and refugees (Health Canada, 2010). However, in addition to excluding many of the most economically vulnerable, the policy only covers 'basic dental services'; it focuses on treating existing dental issues and overlooks the value of preventive dental care (Shaw & Farmer, 2015).

As they may not be well integrated economically and are expected to pay for dental services, non-European immigrants are more likely to face barriers to preventive dental care than their European counterparts. This leads to the first hypothesis of the study:

H_1: Non-European immigrants are less likely to use preventive dental care than European immigrants. This disparity is partly explained by their limited economic integration as reflected in their lower household income, perceived financial wellbeing, and lack of dental insurance.

Cultural and linguistic issues also hamper the integration of many immigrants. Culture is portable and persistent, and immigrants' lives are shaped by the norms, beliefs, and traditions they bring with them (Abada, Frank & Hou, 2017). In fact, immigrants can live in two cultures simultaneously—the Canadian culture and the home country culture. Differences in values and communication styles are known to influence immigrants' cultural adaptation (Kosic, 2002). Non-European immigrants may have greater cultural differences from Canadian norms and values than European immigrants and, if so, they may be more comfortable with the customs of their home countries (Berry, 2005). Language is another issue. Immigrants from former colonies and countries where people officially or predominantly use English and French tend to have adequate language skills in Canada (Zemlyanukhina, 2011). Even among immigrants from non-English speaking countries, however, European immigrants, particularly those from West Europe, tend to have better English language skills than those from non-European regions (Chiswick & Miller, 2001).

In this context, cultural and linguistic minority immigrants may face a barrier to dental care utilization. Exacerbating the issue is the fact that Canadian dental education is largely guided by a biomedical approach and thus lacks consideration of the need for culturally and linguistically competent dental care (Bowen, 2008). This may be problematic because health beliefs and behaviours are based on culture. For example, some East and South Asian immigrants believe illness is a result of the imbalance of body harmony between two opposite yet complementary forces (Yang & Hwang, 2016). Other immigrants may continue to rely on traditional practices, such as the use of chewing and cleaning sticks for oral self-care, instead of switching to modern oral hygiene tools, such as toothbrushes and flossing (Geltman et al., 2014). When they encounter dental problems, some use traditional remedies (Dong et al., 2007). One study finds that Chinese immigrants may find it difficult to trust dentists of Western origins, because their cultural understandings about oral health are so different (Dong et al., 2011). Language is a related issue; Anderson et al. (2003) suggest that the inability to communicate with healthcare providers often undermines trust in the quality of medical care on the one hand and results in diagnostic errors and inappropriate treatment on the other. For these reasons, immigrants with traditional health beliefs and/or limited language proficiency may prefer ethnicity-concordant healthcare providers, a preference that cannot be met given the shortage of culturally and linguistically competent dental care professionals (Bowen, 2008).

Considering the importance of cultural and linguistic resources, and the comparative advantages/disadvantages of the two groups, non-European immigrants may be less likely to access preventive dental care than their European counterparts. This leads to the second hypothesis of the study:

H_2: Non-European immigrants are less likely to use preventive dental care than European immigrants. This disparity is partly explained by their limited linguistic and cultural integration, as reflected in their lack of host country language proficiency, stronger attachment to traditional cultural beliefs, and greater preference for co-ethnic healthcare providers.

It is difficult for some recent visible minority immigrants to achieve social integration. They tend to have low levels of sense of belonging to Canada and high levels of perceived discrimination, suggesting they are treated as cultural outsiders and excluded from the dominant society (Reitz & Banerjee, 2009). Walks and Bourne (2006) point to a high degree of residential concentration of visible minorities in Canada. On the one hand, this implies visible minorities may have limited daily social interactions with the dominant society. On the other hand, visible minority immigrants often settle in ethnic communities that allow them to maintain heritage languages and traditional values, allowing them to develop ethnic solidarity through intergroup contact and socialization (Berry, 2005). This is a mixed blessing when it comes to dental care, however. Although social capital is considered useful for promoting dental care utilization (Batra et al., 2014), the benefit of ethnic solidarity may be questionable, as social capital is useful only when the norm in a social network is to value formal health care (Deri, 2005). Ethnic solidarity may actually lower preventive dental care utilization, as the networks may promote reliance on traditional medicine instead of formal health care (Choi, 2011). In addition, immigrants in ethnic communities may share the norm that priority should be given to more important life events than health care (Woltman & Newbold, 2007).

Based on the findings cited above, non-European immigrants are more likely to face barriers to social integration into the dominant society than their European counterparts, and these barriers will be reflected in their use of preventive dental care services. This leads to the third hypothesis of the study:

H_3: Non-European immigrants are less likely to use preventive dental care than European immigrants. This disparity is partly explained by their more limited social integration, defined as having only co-ethnic friends and having more co-ethnic members in associational involvement.

4.4 Data and analysis

We drew on data from the Longitudinal Survey of Immigrants to Canada (LSIC), a national longitudinal survey of immigrants who arrived in Canada between 2000 and

2001, collected by Statistics Canada and Citizenship and Immigration Canada. The LSIC has three data points, 6 months (wave 1), 2 years (wave 2), and 4 years (wave 3) after the arrival in Canada. It has information relevant to immigrant settlement and integration, including educational attainment, ethnic diversity, values and attitudes, and health and health care utilization. Although about 12,000 immigrants aged 15 or older were randomly selected from sampled households in wave 1, the sample included only 9,300 and 7,700 immigrants in waves 2 and 3 respectively, due to attrition. Statistics Canada designed and provided the longitudinal weights to address this sample attrition. For this study, we limited the sample to adult immigrants aged 18 or older. We employed the listwise deletion technique to address missing cases, as they accounted for less than 2% of the whole sample. The weighted sample for this study was 145,650 adult immigrants.

4.4.1 Dependent variable

The dependent variable was 'preventive dental care utilization'. The LSIC asks respondents whether they use dental care for treatment and preventive purposes in the last 12 months (0=no dental care visit; 1=only treatment; 2=only preventive; 3=treatment and preventive). Given our interest in capturing preventive dental care utilization, we categorized 'only preventive' and 'treatment and preventive' as 'yes' and 'no dental care visit' and 'only treatment' as 'no' (0=no; 1=yes). Although this question was available in waves 2 and 3, information about dental insurance was available only in wave 3. Therefore, we did not explore preventive dental care utilization between waves 1 and 2. We focused on whether respondents used preventive dental care in the last 12 months after 4 years (wave 3) of their arrival in Canada.

4.4.2 Focal independent variable

The focal independent variable was 'immigrant source region'. Although the literature on immigrant health in Canada commonly includes fewer categories of immigrant source regions (see Amoyaw & Abada, 2016; Newbold, 2009), we considered 12 source regions to explore the heterogeneous nature of immigrant origins: West/North Europe, East Europe, South Europe, West/East Africa, Central/South Africa, North Africa, Central

Asia/Middle East, East Asia, Southeast Asia, South Asia, Caribbean/Bermuda/Central/South America, and US/UK/Oceania.

4.4.3 Other explanatory variables

Based on the Andersen's model as well as the literature review mentioned above,e included three types of enabling factors: social, cultural/linguistic, and economic resources. To capture ethnic solidarity, we included two variables related to social relations within ethnic networks. Specifically, social resources included the number of co-ethnic friends (0=not all friends; 1=all friends; 3=no friend) and the number of co-ethnic members in associational involvement (0=not all members; 1=all members; 2=no involvement). Three variables measured cultural/linguistic resources. First, framing health beliefs as part of traditional beliefs, we included the importance of traditional value maintenance (0=not important; 1=important). Second, we included the preference for co-ethnic healthcare providers (0=no; 1=yes), and third, we looked for host country language proficiency (0=proficient; 1=not proficient). We included three variables measuring financial resources: dental insurance (0=yes; 1=no), perceived financial wellbeing (0=more than enough; 1=just about enough; 2=not enough), and household income (0=more than $70000; 1=$45000 to $69999; 2=$25000 to $44999; 3=$10000 to $24999; 4=less than $10000). For control variables, we included predisposing and need factors, following Andersen's model. The predisposing cluster included marital status, gender, place of residence, employment status, age of respondents, and level of education. We included self-rated oral health as part of the need cluster.

4.4.4 Analytical technique

We performed two separate analyses. First, we conducted univariate analysis to describe the sample's characteristics. Second, we used regression analysis to explore the relationship between preventive dental care utilization and immigrant source regions. We employed logistic regression analysis because of the dichotomous nature of the dependent variable (Hosmer, Lemeshow & Sturdivant, 2013). We built models sequentially to explore whether social, cultural/linguistic, and economic resources attenuated the impact

of immigrant source region on preventive dental care utilization. Model 1 estimates the bivariate relationship between preventive dental care utilization and immigrant source regions, while Model 2 controls for the predisposing and need clusters. We added social, cultural/linguistic, and economic resources in Models 3, 4, and 5 respectively. For more meaningful interpretations, we reported results with odds ratios (ORs). ORs larger than 1 indicate that newly arrived immigrants are more likely to use preventive dental care, while those smaller than 1 indicate lower odds of doing so. All the results shown were weighted using the sampling weights provided by Statistics Canada.

4.5 Findings

Table 1 shows findings from the univariate analysis. We find that 43% of immigrants use preventive dental care between 2 and 4 years after arrival. The largest proportion come from East Asia (25%) and South Asia (25%), followed by Central Asia/Middle East (9%), Southeast Asia (9%), and East Europe (8%). It is noteworthy that 15% and 10% of immigrants have only co-ethnic friends and are members of ethnic associations respectively. About 60% and 70% of immigrants are not proficient in English and/or French and do not think having co-ethnic healthcare providers is important respectively. We also find that about two fifths of immigrants (43%) do not have dental insurance, and about 20% do not think they have enough money. It is also noteworthy that 30% report household income lower than $25,000.

Table 2 shows findings from the logistic regression analysis. Overall, the relationship between preventive dental care utilization and immigrant source region is modified by social, cultural, and economic resources. In Model 1, we find at the bivariate level that newly arrived immigrants from West/East Africa (OR=0.46; $p<0.001$), North Africa (OR=0.32; $p<0.001$), Central Asia/Middle East (OR=0.45; $p<0.001$), East Asia (OR=0.62; $p<0.01$), and South Asia (OR=0.40; $p<0.001$) are less likely to use preventive dental care than those from West/North Europe. Even after controlling for the predisposing and need characteristics in Model 2, the findings remain largely consistent with the bivariate findings, except that the significance for West/East Africans is partly attenuated once level of education is controlled for (OR=0.51; $p<0.01$). In Model 3, the

significance for Central Asians/Middle Easterners (OR=0.55; p<0.01) and East Asians (OR=0.64; p<0.05) is partly attenuated once we control for social resources, specifically the number of co-ethnic friends. Moreover, in Model 4, linguistic and cultural resources, specifically language proficiency and preference for co-ethnic healthcare providers, partly and completely attenuate the significance for Central Asians/Middle Easterners (OR=0.68; p<0.05) and East Asians (OR=0.87; p>0.05) respectively. We also find that the difference between Southeast Asians and West/North Europeans is supressed by cultural resources in Model 4. That is, although this relationship is not significant in Model 3, Southeast Asians are more likely to use preventive dental care than West/North Europeans in Model 4 once the importance of traditional value maintenance and preferences for co-ethnic healthcare providers are adjusted for (OR=1.65; p<0.05). Finally, in Model 5, economic resources, such as dental insurance, perceived financial wellbeing, and household income, completely attenuate the significance for Central Asians/Middle Easterners (OR=0.88; p>0.05) and partly attenuate the significance for West/East Africans (OR=0.59; p<0.05), North Africans (OR=0.48; p<0.01), and South Asians (OR=0.59; p<0.05).

4.6 Discussion and conclusions

Research documents that recent immigrants are less likely to use dental care than the native-born in Canada. This is problematic because immigrants' oral health is observed to worsen quickly after their arrival, following the downward trend of the 'healthy immigrant effect'. Therefore, it is important to pay attention to immigrants' preventive dental care utilization within a few years of arrival. We argue that it is equally important to consider the role of immigrant source region. Modifying Andersen's behavioural model and adapting the institutional approach to immigrant integration, we examine the relationship between preventive dental care utilization and immigrant source region among newly arrived immigrants in Canada.

At the bivariate level, we find that newly arrived immigrants from non-European regions, such as West/East Africa, North Africa, Central Asia/Middle East, East Asia, and South Asia, are less likely to use preventive dental care than those from West/North

Europe. This finding is largely consistent with previous Canadian studies. Newbold and Patel (2006) find that Asian immigrants are less likely to use dental care once a year than European immigrants. Moreover, African, Middle Eastern, South Asian, and Chinese immigrants are more likely to have unmet dental care needs than European immigrants (Calvasina et al., 2014). These findings suggest non-European immigrants encounter more barriers to dental care utilization than their European counterparts.

Multivariate analysis proves useful in understanding whether such barriers are linked to a lack of social, cultural, linguistic, and/or economic integration among non-European immigrants. We observe that lower rates of preventive dental care utilization among Central Asians/Middle Easterners and East Asians than West/North Europeans are partially explained by the number of co-ethnic friends. This is consistent with our expectation that strong ethnic solidarity may have a negative impact on formal health care utilization, in this case, preventive dental care. According to Fong and Isajiw (2000), the formation of co-ethnic friendship is partially motivated by the systemic racial and linguistic exclusion of minority groups from the dominant society. It is possible that members of linguistic and racial minority immigrant groups engage less in preventive dental care if these networks value traditional medicine or perceive other life events as more important than health care utilization (Choi, 2011; Woltman & Newbold, 2007). The lack of social integration into the dominant society may be detrimental to visible and linguistic minority groups, such as Central Asians/Middle Easterners and East Asians.

We also find preferences for co-ethnic healthcare providers and language proficiency explain the lower rates of preventive dental care utilization by Central Asians/Middle Easterners and East Asians than West/North Europeans. This corroborates our expectation that some immigrants may be affected by the lack of culturally and linguistically competent dental care in Canada. Dentistry is largely guided by the biomedical model (Butani, Weintraub & Barker, 2008). This model is culturally insensitive and can create situations where immigrants who prefer cultural alternatives are uncomfortable (Dong et al., 2011). Similarly, the unavailability of professional dental care interpreters is problematic for many (Bowen, 2008). Not surprisingly, they may prefer dental care from a co-ethnic dentist, but this is difficult given the shortage of

culturally and linguistically competent dental care in Canada. Our findings indicate that a lack of cultural and linguistic integration stops many immigrants from accessing preventive dental care, especially those from non-European regions, such as Central Asia, the Middle East, and East Asia.

Interestingly, the differences between South Asians and West/North Europeans are suppressed by cultural resources, such as the importance of traditional value maintenance and preference for the same ethnic healthcare providers. This may be attributed to their educational characteristics, as Southeast Asian immigrants, particularly those from the Philippines, often have educational backgrounds in nursing (Salami, 2016). It is possible that the importance of regular dental care is more widely understood in this group.

Perceived financial wellbeing, dental insurance, and household income partly explain the lower rates of preventive dental care utilization among West/East Africans, North Africans, Central Asians/Middle Easterners, and South Asians than among West/North Europeans. It is well-established that non-European immigrants are more likely to experience unemployment, precarious employment, low income, and poverty (Buzdugan & Halli, 2009; Nakhaie & Kazemipur, 2013). As preventive dental care is only covered by private dental insurance and out-of-pocket expenditures (CIHI, 2015; Shaw & Farmer, 2015), our analysis emphasizes that a lack of economic integration is a barrier to preventive dental care utilization by non-European immigrants, such as West/East Africans, North Africans, Central Asians/Middle Easterners, and South Asians.

We are not able to fully explain why West/East Africans, North Africans, and South Asians have lower rates of preventive dental care utilization than West/North Europeans. There are at least two potential reasons for this. First, we conceptualize oral health beliefs as part of cultural beliefs and thus control for the importance of traditional value maintenance. However, it may be useful to include a variable that specifically focuses on cultural beliefs about oral health, as some cultural myths may restrict some immigrants from using preventive dental care (Butani et al., 2008). Second, we were not able to control for preventive dental care utilization prior to migration, and this is

considered influential for health care utilization in the host country (Yang & Hwang, 2016). Many countries in Africa, Asia, and Latin America have shortages of oral health personnel and facilities and place little emphasis on preventive dental care (Petersen et al., 2005). These factors may explain why West/East Africans, North Africans, and South Asians have lower rates of preventive dental care utilization.

These findings have several policy implications. Having only co-ethnic friends partially explains lower rates of preventive dental care utilization by Central Asians/Middle Easterners and East Asians. It may be useful to disseminate information about oral health and dental care utilization in ethnic institutions, such as churches, grocery stores, schools, and restaurants. Lacking proficiency in English or French and preferring co-ethnic healthcare providers also explain lower rates of preventive dental care utilization among Central Asians/Middle Easterners and East Asians. Accordingly, we need to increase the number of visible minority and immigrant dental care professionals, as well as language interpreters in the field. Finally, the lack of financial resources explains lower preventive dental care utilization by many non-European immigrants, pointing to the need for affordable preventive dental care for this group.

We acknowledge several limitations in this study. First, estimating the role of culture in health care utilization is difficult, especially in quantitative analysis (Butani et al., 2008). Future work could examine how traditional values related to oral health and oral health care utilization influence immigrants' preventive dental care utilization. Second, we were not able to control for preventive dental care utilization prior to migration, as the LSIC does not have relevant information. Third, we could not explore preventive dental care utilization six months and two years after arrival, due to the lack of information on dental care and dental insurance. Given that immigrants are most economically disadvantaged at the time of their arrival (Phythian, Walters & Anisef, 2009), the lack of financial resources, including dental insurance, may be more detrimental between six months and two years post-arrival. Taken together, these limitations suggest the need to collect comprehensive longitudinal data on immigrants' oral health and dental care utilization. Finally, we examined the role of immigrant source region on preventive dental care utilization to explore the heterogeneity of newly arrived

immigrants. While this approach is useful, we were not able to explore the role of admission class as immigrant source region and admission class were highly correlated. Addressing this void seems to be important as research has increasingly shown that refugees tend to report poor physical and emotional health than other immigrant groups (Amoyaw & Abada, 2017; Newbold, 2009).

Table 4.1 Univariate analysis of dependent and independent variables

	Percentage
Preventive dental care	
No	57
Yes	43
Immigrant source region	
West/North Europe	3
East Europe	8
South Europe	3
West/East Africa	3
Central/South Africa	1
North Africa	5
Central Asia/Middle East	9
East Asia	25
Southeast Asia	9
South Asia	25
Caribbean/Bermuda/Central/South America	6
US/UK/Oceania	3
Number of co-ethnic friends	
Not all friends	79
All friends	15
No friend	6
Number of co-ethnic members in association	
Not all members	17
All members	10
No associational involvement	73
Language proficiency	
Proficient	42
Not proficient	58
Importance of traditional values	
Not important	14
Somewhat important	51
Very important	35
Importance of co-ethnic healthcare providers	
Not important	67
Somewhat important	19
Very important	14
Dental insurance	
Yes	57
No	43
Perceived financial wellbeing	
More than enough	17
Just enough	62
Not enough	21
Household income	
>$70000	16
$45000-$69999	23

$25000-$44999	31
$10000-$24999	22
<$10000	8

†Mean score; Findings for control variables not shown due to space limitation but available upon request; Data Source: The Longitudinal Survey of Immigrants to Canada

Table 4.2 Multivariate analysis of 'preventive dental care utilization' among immigrants newly arrived in Canada

	Model 1			Model 2			Model 3			Model 4			Model 5		
	OR	SE		OR	SE		OR	SE		OR	SE		OR	SE	
Immigrant source region															
West/North Europe	1.00			1.00			1.00			1.00			1.00		
East Europe	1.05	0.18		0.85	0.16		0.88	0.16		1.08	0.21		1.22	0.26	
South Europe	1.04	0.20		1.13	0.24		1.17	0.25		1.48	0.33		1.59	0.38	
West/East Africa	0.46	0.10	***	0.51	0.12	**	0.49	0.11	**	0.49	0.12	**	0.59	0.15	*
Central/South Africa	0.93	0.22		1.09	0.28		1.03	0.27		0.99	0.26		1.12	0.30	
North Africa	0.32	0.06	***	0.33	0.07	***	0.34	0.07	***	0.37	0.08	***	0.48	0.11	**
Central Asia/Middle East	0.45	0.08	***	0.53	0.10	***	0.55	0.11	**	0.68	0.13	*	0.88	0.19	
East Asia	0.62	0.09	**	0.61	0.11	**	0.64	0.11	*	0.87	0.16		1.09	0.22	
Southeast Asia	1.37	0.23		1.36	0.26		1.35	0.26		1.65	0.32	*	1.73	0.37	*
South Asia	0.40	0.06	***	0.40	0.07	***	0.43	0.08	***	0.50	0.09	***	0.59	0.12	*
Caribbean/Central/South America	0.95	0.17		1.06	0.21		1.05	0.21		1.19	0.24		1.34	0.30	
US/UK/Oceania	1.26	0.24		1.46	0.31		1.41	0.30		1.30	0.28		1.17	0.28	
Number of co-ethnic friends															
Not all friends							1.00			1.00			1.00		
All friends							0.67	0.06	***	0.73	0.07	***	0.75	0.07	**
No friend							0.82	0.10		0.84	0.10		0.92	0.11	
Number of co-ethnic members in association															
Not all members							1.00			1.00			1.00		
All members							0.90	0.10		0.94	0.11		0.95	0.11	
No associational involvement							0.80	0.06	**	0.83	0.06	*	0.86	0.07	
Language proficiency															
Proficient										1.00			1.00		
Not proficient										0.68	0.05	***	0.77	0.05	***
Importance of traditional values															
Not important										1.00			1.00		
Somewhat important										0.90	0.07		0.91	0.08	
Very important										0.79	0.07	*	0.79	0.08	*

Importance of co-ethnic healthcare providers									
Not important				1.00			1.00		
Somewhat important				0.91	0.07		0.95	0.08	
Very important				0.81	0.08	*	0.86	0.08	
Dental insurance									
Yes							1.00		
No							0.28	0.02	***
Perceived financial wellbeing									
More than enough							1.00		
Just enough							0.85	0.07	
Not enough							0.75	0.08	**
Household income									
>$70000							1.00		
$45000-$69999							0.80	0.08	*
$25000-$44999							0.74	0.07	**
$10000-$24999							0.59	0.06	***
<$10000							0.70	0.10	*
Log pseudo-likelihood	-90323.02		-89931.46	-89278.70			-83216.19		

OR=odds ratio; SE=standard error; *p<0.05, **p<0.01, ***p<0.001; Control variables adjusted in Models 2, 3, 4, and 5 but not shown; Results for control variables available upon request; Data Source: The Longitudinal Survey of Immigrants to Canada

Appendix 4.1 Summary of variables

Variables	Categories†
Preventive dental care	0=No
	1=Yes
Immigrant source region	0=West/North Europe
	1=East Europe
	2=South Europe
	3=West/East Africa
	4=Central/South Africa
	5=North Africa
	6=Central Asia/Middle East
	7=East Asia
	8=Southeast Asia
	9=South Asia
	10=Caribbean/Bermuda/Central/South America
	11=US/UK/Oceania
Number of co-ethnic friends	0=Not all friends
	1=All friends
	2=No friend
Number of co-ethnic members in association	0=Not all members
	1=All members
	2=No associational involvement
Language proficiency	0=Proficient
	1=Not proficient
Importance of traditional values	0=Not important
	1=Somewhat important
	2=Very important
Importance of co-ethnic healthcare providers	0=Not important
	1=Somewhat important
	2=Very important
Dental insurance	0=Yes
	1=No
Perceived financial wellbeing	0=More than enough
	1=Just enough
	2=Not enough

Household income	0=>$70000 1=$45000-$69999 2=$25000-$44999 3=$10000-$24999 4=<$10000

ǂReference category coded as ‘0’ for each variable; Control variables not mentioned here but available upon request

4.7 References

Abada, T., Frank, K., & Hou, F. (2018). Between Two Worlds: Source-Country Gender Roles and Gender Differences in Educational Attainment among Immigrant Children. *Sociological Inquiry, 88*(1), 131-154.

Akbari, A. H., & MacDonald, M. (2014). Immigration policy in Australia, Canada, New Zealand, and the United States: An overview of recent trends. *International Migration Review, 48*(3), 801-822.

Aldossary, A., Harrison, V. E., & Bernabé, E. (2015). Long-term patterns of dental attendance and caries experience among British adults: a retrospective analysis. *European Journal of Oral Sciences, 123*(1), 39-45.

Amoyaw, J. A., & Abada, T. (2016). Does helping them benefit me? Examining the emotional cost and benefit of immigrants' pecuniary remittance behaviour in Canada. *Social Science & Medicine, 153*, 182-192.

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

Anderson, L. M., Scrimshaw, S. C., Fullilove, M. T., Fielding, J. E., Normand, J., & Task Force on Community Preventive Services. (2003). Culturally competent healthcare systems: A systematic review. *American Journal of Preventive Medicine, 24*(3), 68-79.

Aida, J., Kondo, K., Kondo, N., Watt, R. G., Sheiham, A., & Tsakos, G. (2011). Income inequality, social capital and self-rated health and dental status in older Japanese. *Social Science & Medicine, 73*(10), 1561-1568.

Batista, R., Pottie, K., Bouchard, L., Ng, E., Tanuseputro, P., & Tugwell, P. (2018). Primary health care models addressing health equity for immigrants: a systematic scoping review. *Journal of Immigrant and Minority Health, 20*(1), 214-230.

Batra, M., Tangade, P., Rajwar, Y. C., Dany, S. S., & Rajput, P. (2014). Social capital and oral health. *Journal of Clinical and Diagnostic Research, 8*(9), ZE10-ZE11.

Bauder, H. (2003). "Brain abuse", or the devaluation of immigrant labour in Canada. *Antipode, 35*(4), 699-717.

Bedos, C., Brodeur, M., Benigeri, M., & Olivier, M. (2004). Utilization of preventive dental services by recent immigrants in Quebec. *Canadian Journal of Public Health, 95*(3), 219–223.

Beiser, M. (2005). The health of immigrants and refugees in Canada. *Canadian Journal of Public Health, 96*(2), S30-S44.

Berry, J. W. (2005). Acculturation: Living successfully in two cultures. *International Journal of Intercultural Relations*, *29*(6), 697-712.

Burr, J. A., & Lee, H. J. (2013). Social relationships and dental care service utilization among older adults. *Journal of Aging and Health*, *25*(2), 191-220.

Butani, Y., Weintraub, J. A., & Barker, J. C. (2008). Oral health-related cultural beliefs for four racial/ethnic groups: Assessment of the literature. *BMC Oral Health*, *8*(1), 26.

Buzdugan, R., & Halli, S. S. (2009). Labor Market Experiences of Canadian Immigrants with Focus on Foreign Education and Experience. *International Migration Review*, *43*(2), 366-386.

Bowen, S. (2008). Providing care in a changing society: what do health care providers really need to know about cultural diversity? *Canadian Journal of Dental Hygiene*, *42*(2), 108-113.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2014). Factors associated with unmet dental care needs in Canadian immigrants: an analysis of the longitudinal survey of immigrants to Canada. *BMC Oral Health*, *14*(1), 145.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2015). The deterioration of Canadian immigrants' oral health: analysis of the Longitudinal Survey of Immigrants to Canada. *Community Dentistry and Oral Epidemiology*, *43*(5), 424-432.

Choi, S. (2011). A critical review of theoretical frameworks for health service use among older immigrants in the United States. *Social Theory & Health*, *9*(2), 183-202.

Chiswick, B. R., & Miller, P. W. (2001). A model of destination-language acquisition: Application to male immigrants in Canada. *Demography*, *38*(3), 391-409.

CIHI. (2015). *National Health Expenditure Trends, 1975 to 2015*. Toronto, ON: CIHI. https://secure.cihi.ca/free_products/nhex_trends_narrative_report_2015_en.pdf. Accessed on August 28, 2018.

De Maio, F. G. (2010). Immigration as pathogenic: a systematic review of the health of immigrants to Canada. *International Journal for Equity in Health*, *9*(1), 27.

Deri, C. (2005). Social networks and health service utilization. *Journal of Health Economics*, *24*(6), 1076-1107.

Dong, M., Levine, A., Loignon, C., & Bedos, C. (2011). Chinese immigrants' dental care pathways in Montreal, Canada. *Journal of the Canadian Dental Association*, *77*, b131.

Dong, M., Loignon, C., Levine, A., & Bedos, C. (2007). Perceptions of oral illness among Chinese immigrants in Montreal: a qualitative study. *Journal of Dental Education, 71*(10), 1340-1347.

Fong, E., & Isajiw, W. W. (2000). Determinants of friendship choices in multiethnic society. *Sociological Forum*, *51*(2), 249-271.

Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*, *34*(6), 1273-1302.

Gilbert, G. H., Paul Duncan, R., & Shelton, B. J. (2003). Social determinants of tooth loss. *Health Services Research*, *38*(6p2), 1843-1862.

Health Canada. (2006). *2006 Canada Health Act: Annual Report 2005–2006*. Ottawa, ON: Health Canada. http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/chaar-ralcs-0506/chaar-ralcs-0506_e.pdf. Accessed on August 28, 2018.

Health Canada. (2010). *Report on the findings of the oral health component of the Canadian Health Measures Survey 2007–2009*. Ottawa, ON: Health Canada. http://www.fptdwg.ca/assets/PDF/CHMS/CHMS-E-tech.pdf. Accessed on August 28, 2018.

Hosmer, D., Lemeshow, S., & Sturdivant, R. (2013). *Applied Logistic Regression, 3rd edition*. New York, NY: John Wiley and Sons.

Kazemipur, A., & Halli, S. S. (2001). The changing colour of poverty in Canada. *Canadian Review of Sociology*, *38*(2), 217-238.

Khan, M. M., Kobayashi, K., Vang, Z. M., & Lee, S. M. (2017). Are visible minorities "invisible" in Canadian health data and research? A scoping review. *International Journal of Migration, Health and Social Care*, *13*(1), 126-143.

Kosic, A. (2002). Acculturation attitudes, need for cognitive closure, and adaptation of immigrants. *Journal of Social Psychology*, *142*(2), 179-201.

Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. Journal of Health and Social Behavior, *extra issue*, 80-94.

Locker, D., Maggirias, J., & Quiñonez, C. (2011). Income, dental insurance coverage, and financial barriers to dental care among Canadian adults. *Journal of Public Health Dentistry*, *71*(4), 327-334.

Miller, T. A., & DiMatteo, M. R. (2013). Importance of family/social support and impact on adherence to diabetic therapy. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 6*, 421-426.

Nakhaie, M. R., & Kazemipur, A. (2013). Social capital, employment and occupational status of the new immigrants in Canada. *Journal of International Migration and Integration*, *14*(3), 419-437.

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

Newbold, B. (2009). The short-term health of Canada's new immigrant arrivals: evidence from LSIC. *Ethnicity & Health*, *14*(3), 315-336.

Newbold, K. B., & Patel, A. (2006). Use of dental services by immigrant Canadians. *Journal of the Canadian Dental Association*, *72*(2), 143.

Oreopoulos, P., & Dechief, D. (2011) *Why do some employers prefer to interview Matthew, but not Samir? New Evidence from Toronto, Montreal, and* Vancouver. Centre of Excellence for Research on Immigration and Diversity, Working Paper Series 11, no. 13, Metropolis British Columbia.

Petersen, P. E., Bourgeois, D., Ogawa, H., Estupinan-Day, S., & Ndiaye, C. (2005). The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization*, *83*(9), 661-669.

Phythian, K., Walters, D., & Anisef, P. (2009). Entry class and the early employment experience of immigrants in Canada. *Canadian Studies in Population*, *36*(3-4), 363-382.

Putnam, R. (2000). Bowling Alone: America's Declining Social Capital. IN Crothers L, & Lockhart C. (Eds.), *Culture and Politics* (pp. 223–234). New York, NY: Palgrave Macmillan.

Reitz, J. G. (1998). *Warmth of the Welcome: The Social Causes of Economic Success for Immigrants in Different Nations and Cities*. Boulder, CO: Westview Press.

Reitz, J. G. (2001). Immigrant skill utilization in the Canadian labour market: Implications of human capital research. *Journal of International Migration and Integration*, *2*(3), 347-378.

Reitz, J. G., & Banerjee, R. (2009). Racial inequality and social cohesion. In J. G. Reitz, K. K. Breton, & K. L. Dion (Eds.), *Multiculturalism and social cohesion: Potentials and challenges of diversity* (pp.123-155). New York, NY: Springer.

Reza, M., Amin, M. S., Sgro, A., Abdelaziz, A., Ito, D., Main, P., & Azarpazhooh, A. (2016). Oral health status of immigrant and refugee children in North America: a scoping review. *Journal of Canadian Dental Association*, *82*(g3).

Salami, B. (2016). Migrant nurses and federal caregiver programs in Canada: Migration and health human resources paradox. *Canadian Journal of Nursing Research*, *48*(2), 35-40.

Sano, Y., & Abada, T. (2017). Immigration as a social determinant of oral health in Ontario, Canada. Presented at the Canadian Population Society Annual Meeting. Regina, SK.

Shaw, J. L., & Farmer, J. (2015). *An environmental scan of publicly financed dental care in Canada: 2015 update*. Ottawa, ON: Office of the Chief Dental Officer.

Thompson, B., Cooney, P., Lawrence, H., Ravaghi, V., & Quiñonez, C. (2014). Cost as a barrier to accessing dental care: findings from a Canadian population-based study. *Journal of Public Health Dentistry*, *74*(3), 210-218.

Ubelacker, S. (2015). Dental checkups: How often are they needed? Vancouver, BC: Global News. https://globalnews.ca/news/1938411/dental-checkups-how-often-are-they-needed. Accessed on August 28, 2018.

Vang, Z. M., Sigouin, J., Flenon, A., & Gagnon, A. (2017). Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. *Ethnicity & Health*, *22*(3), 209-241.

Walks, R. A., & Bourne, L. S. (2006). Ghettos in Canada's cities? Racial segregation, ethnic enclaves and poverty concentration in Canadian urban areas. *Canadian Geographer*, *50*(3), 273-297.

Wilson, K., & Rosenberg, M. W. (2002). The geographies of crisis: exploring accessibility to health care in Canada. *Canadian Geographer*, *46*(3), 223-234.

Woltman, K. J., & Newbold, K. B. (2007). Immigrant women and cervical cancer screening uptake: a multilevel analysis. *Canadian Journal of Public Health*, *98*(6), 470-475.

Wu, B., Liang, J., Luo, H., & Furter, R. (2013). Racial and Ethnic Variations in Preventive Dental Care Utilization among Middle-Aged and Older Americans, 1999–2008. *Frontiers in Public Health*, *1*(65).

Yang, P. Q., & Hwang, S. H. (2016). Explaining immigrant health service utilization: A theoretical framework. *Sage Open*, *6*(2), 1-15.

Zemlyanukhina, V. (2011). *Aspects of Linguistic Integration of Recent Immigrants to Canada: Determinants of English Language Proficiency, Role of English in Labour Market Integration Outcomes and Skills Utilization*. Unpublished dissertation. Toronto, ON: University of Toronto.

Chapter 5

5. Discussion and conclusions

Oral health is critical for people's economic, social, and psychological well-being. Yet, the literature to date pays very little attention to the status of adult immigrants' oral health in Canada. This is rather surprising given that other health outcomes such as physical and mental health are largely discussed within the spectrum of the healthy immigrant effect. Oral health is largely understood within the biomedical and behavioural frameworks. For example, dental professionals often focus solely on preventive care by employing clinical techniques such as fluoride application and fissure sealants. Similarly, it is common for oral health interventions to elicit positive changes in individual behaviours such as brushing, flossing, and dietary intake as well as general dental care checkups.

This dissertation considers the social determinants of the oral health framework, which contextualizes poor oral health as being reflective of inequality within a broader social, economic, and cultural context. This framework can be further contextualized with Beiser's explanations of the 'healthy immigrant effect', which focuses on both behavioural and structural determinants of immigrant health. At the same time, Reitz's institutional approach of immigrant integration is used to highlight the mechanisms by which some immigrants are excluded from the dominant society, with accompanying exposure to structural barriers to achieving social, cultural, and economic integration. Acknowledging their socially, culturally, and economically vulnerable positions, this dissertation argues that Canada's current oral health policy leads to poor oral health among some adult immigrants.

Dental care is not part of Canada's universal healthcare system. The majority of Canadians are privately responsible for the costs of dental care, either by using private dental insurance or paying out-of-pocket. It should be noted however that 6% of dental care services are publicly secured among vulnerable populations such as the disabled, Aboriginal group, refugees, and social welfare recipients. Given this context, the lack of universal dental insurance is a problem for more than 30% of Canadians, who have

reported financial barriers as a major reason to avoid dental care or to decline recommended dental treatments. However, despite dental insurance coverage being a critical public health issue, we know very little about its impact on immigrants who themselves often face labour market challenges in Canada.

The literature also points to a lack of preventive health care utilization as one of the reasons for immigrants' declining physical and mental health status. However, past studies have rarely explored their preventive dental care utilization behaviors. Furthermore, the literature on immigrant health largely treats immigrants as a homogeneous group and this approach may not be viable because immigrants, particularly contemporary immigrants, are predominantly from non-European regions such as Asia, Latin America, the Caribbean, and Africa. Contemporary immigrants may hold different social, cultural, linguistic, and economic outcomes from European immigrants and the native-born. Therefore, it is important to explore the potential disparity in preventive dental care utilization between newly arrived immigrants of non-European and European origin.

This dissertation applies regression analysis techniques to large regionally and nationally representative datasets to explore three important issues, specifically immigrants' 1) oral health, 2) dental insurance coverage, and 3) preventive dental care utilization. This chapter revisits the main findings from the three integrated articles and identifies the significant contributions to the literature. Based on these findings, this chapter also provides several policy implications and possible directions for future research.

5.1 Revisiting the main findings: What are the contributions?

While oral health of immigrant children is relatively well-explored, there are only few studies that have examined the oral health of adult immigrants in Canada. Using the nationally representative sample of newly arrived immigrants, researchers have observed that their oral health begins to decline at two years after their arrival to Canada (Calvasina, Muntaner & Quiñonez, 2015). Similarly, Ghiabi, Matthews, and Brillant

(2014) analyze the oral health of 86 recent immigrants and refugees in Nova Scotia, concluding that this population may be at an oral health disadvantage as compared with the native-born. Building on the findings of these studies, Chapter 2 contributes to the literature by examining whether the 'healthy immigrant effect' also applies to oral health in Ontario, Canada. Specifically, this chapter uses a large regionally representative sample from the Canadian Community Health Survey (CCHS) to compare the self-rated oral health of recent immigrants (living in Canada for less than 10 years), established immigrants (living in Canada for 10 years or more), and the native-born in Ontario.

Findings from the logistic regression analysis indicate partial evidence for the healthy immigrant effect. Although established immigrants (10 years or more) rate their oral health as worse than the native-born at the bivariate level, the difference between recent immigrants (less than 10 years) and the native-born is not statistically significant. Consistent with the healthy immigrant effect (De Maio, 2010; Vang et al., 2017), the oral health of immigrants seems to worsen after 10 years of their arrival to Canada. This finding lends support to previous research (Calvasina et al., 2015) that finds oral health of immigrants declining quickly after their arrival to Canada. However, it is contrary to the results obtained by Ghiabi et al. (2014), who find in Nova Scotia that the oral health of recent immigrants may be worse than that of the native-born. It is possible that immigrants' experiences relating to oral health may differ between more popular destinations such as Ontario and less traditional destinations such as Nova Scotia. As expected by the resettlement stress perspective (Beiser, 2005), the oral health disparity between established immigrants and the native-born is partly explained by structural characteristics such as household income adequacy and access to dental care. This finding may be reflective of systemic economic exclusion of immigrants. Some studies show that even established immigrants face challenges in becoming fully integrated into the labour market in Canada (Girard & Smith, 2013; Hum & Simpson, 2004). Consequently, as dental care is not part of the universal healthcare system, immigrants may experience financial challenges to obtaining dental care, even after 10 years of their arrival to Canada.

However, inconsistent with the healthy immigrant effect, an initial oral health advantage is not observed among recent immigrants. The analysis further shows that recent immigrants have better oral health than the native-born once structural factors captured by the resettlement stress perspective, such as household income adequacy and access to dental care, are adjusted for. That being said, recent immigrants generally seem to maintain a similar level of oral health to that of the native-born, despite the financial challenges they may encounter in the initial years of settlement. Interestingly, this advantage is completely explained by self-rated physical health. Considering the linkage between oral health and physical health (Sheiham & Watt, 2000), it is possible that selective migration, which positively influences immigrants' physical health, plays an important role in explaining their oral health at the time of arrival (Gee, Kobayashi & Prus, 2004).

Findings from this chapter are important for developing a theory for understanding immigrants' health and oral health. For example, considering the link between oral and physical health, it is critical that the literature begins to incorporate oral health as part of the ongoing discussion regarding the healthy immigrant effect. This is important because immigrants' oral health trajectory seems to be consistent with that of their physical and mental health. Moreover, although oral health research is largely directed by the biomedical approach, it is also critical to understand the oral health of immigrants within the social determinants of oral health framework, because it highlights the systemic barriers for achieving optimal oral health. As argued by Beiser (2005), immigrants' declining oral health may be a product of their structural vulnerabilities in the host society. This can be further expanded by Peterson and Kwon (2011: 481), suggesting that 'oral disease and illness remain global problems and wide inequities in oral health status exist among different social groups between and within countries'. This chapter also finds that the convergence perspective, which focuses on changes in immigrants' lifestyles over time, does not explain the disparity between established immigrants and the native-born. This result raises the question as to whether the behavioural approach is effective in mitigating immigrants' declining oral health. Rather than using a 'victim-blaming' approach that centers on individuals' lifestyle choices such as smoking and drinking (Watt, 2007), this chapter recognizes the importance of treating

social inequality as a critical determinant of poor oral health that affects immigrants in Canada.

Immigrants' health insurance coverage is rarely explored in Canada. Universal health care excludes several types of insurance coverages, such as drug prescription, eyeglasses, and dental care. While research finds the lack of insurance coverages for prescribed drugs and eyeglasses a common problem among immigrants (Ngo et al., 2018; Ngwakongnwi et al., 2012), the disparity in dental insurance coverage between immigrants and the native-born remains underexplored in Canada. Moreover, the literature on health insurance coverage often adopts the economic approach, analyzing whether full-time workers attain employer-based health insurance (Meyer & Pavalko, 1996; Montez, Angel & Angel, 2009). It is important to extend our understanding to include whether individuals have ways to attain health insurance when employer-based health insurance is not available. Drawing a theoretical framework from Reitz's institutional approach of immigrant integration, Chapter 3 analyzes the large regionally representative sample from the CCHS to examine how recent immigrants (less than 10 years), established immigrants (10 years or more), and the native-born obtain employer-based, privately purchased, and government-assisted dental insurance in Ontario, Canada.

Although the lack of dental insurance is an issue for many Canadians, findings from the multinomial logistic regression analysis show that recent and established immigrants, as compared with the native-born, are less likely to obtain government-assisted, privately purchased, and employer-based dental insurance than to be uninsured. This chapter further reveals that economic characteristics such as household income adequacy and employment status, at least partly explain the disparity in privately purchased and employer-based dental insurance coverage between immigrants and the native-born. The institutional framework may be useful in explaining this disparity. Understanding health care as a type of social welfare, the exclusion of dental care from the universal healthcare system disproportionally affects economically vulnerable populations such as immigrants who face labour market challenges. Specifically, some immigrants may not be able to receive employee benefits such as dental insurance, as they often face unemployment and precarious forms of employment (Noack & Vosko,

2011; Reitz, Curtis & Elrick, 2014). Even when dental care is offered in their place of employment, low wages can deter some immigrants to forgo dental insurance coverage within their benefit plan and instead favour a higher take home pay (Abraham, Vogt & Gaynor, 2006; Royalty & Hagens, 2005). The disparity in employer-based dental insurance between recent immigrants and the native-born remains significant, even after controlling for economic characteristics. Given that the majority of contemporary immigrants are from non-European countries, this unobserved heterogeneity may be explained by cultural differences. Specifically, many developing societies lack dental care facilities and place little emphasis on preventive efforts (Petersen et al., 2005). Thus, limited knowledge about oral health and the dental care system in Canada may influence some recent immigrants to opt out of employer-based dental insurance.

For government-assisted dental insurance, the disparity between immigrants and the native-born does not disappear after adjusting for economic characteristics. Unlike in the case of the unemployed, disabled, and Aboriginal populations, immigrants are not eligible for government-assisted dental insurance unless they participate in social welfare programs (Blomqvist & Wooley, 2018). This is consistent with Canada's expectation of immigrants to be less dependent on social assistance in the host society. Importantly, the majority of immigrants are recruited based on the 'points system', which allows Canada to select individuals with high levels of human capital (Akbari & MacDonald, 2014). Yet, immigrants, particularly recent immigrants, often face institutional barriers to economic integration such as racial labour market discrimination and under-/non-recognition of foreign human capital. Research also shows that it may be difficult for even established immigrants to fully achieve economic integration (Girard & Smith, 2013; Hum & Simpson, 2004). Supporting this argument, Smith-Carrier and Mitchell (2015) find that immigrants are less likely to participate in social welfare programs as compared with the native-born, which in turn presents a major barrier to obtaining government-assisted dental insurance as an alternative to being uninsured.

Chapter 3 also adds a unique theoretical perspective to the literature on health insurance coverage. The literature largely employs economic approaches, which present individuals as rational actors. Individuals are expected to make rational decisions whether

they receive health insurance from their employers or not (Meyer & Pavalko, 1996; Montez et al., 2009). This chapter shows the importance of highlighting immigrants' dental insurance coverage as institutionally determined in Canada. Based on Reitz's institutional framework, this chapter recognizes dental insurance as a type of social welfare. This is helpful in distinguishing dental care from Canada's universal healthcare system, because many Canadians need to obtain dental insurance either through employers or private sources unless they qualify for government-assisted coverage. This point is critical, as previous research often only looks at employer-based health insurance. In addition, this framework recognizes several institutional factors that undermine the successful integration of some immigrants. For example, the size of the native-born population with higher education has increased over the last two decades, with employers having access to a large pool of highly educated job candidates (Reitz et al., 2014). Not surprisingly, some employers will prefer candidates with Canadian human capital over foreign human capital. Immigrants, particularly recent immigrants, experience labour market challenges despite their high levels of human capital (Buzdugan & Halli, 2009). Furthermore, it is possible that labour market discrimination hampers their economic success in Canada (Frank et al., 2013; Kazemipur & Halli, 2001). Thus, immigrants' lower rates of employer-based and privately purchased coverage should be understood in the institutional context of immigrant integration. Also, Canada's immigration policy expects immigrants to be economically independent in the host society, as highly skilled individuals and their families compose the majority of immigrant intakes. Indeed, immigrants have lower levels of social welfare participation than the native-born, which may explain their lower rates of government-assisted coverage utilization. In this context, this finding needs to be understood in relation to Canada's immigration recruitment strategy.

Immigrants' preventive dental care utilization remains largely underexplored in Canada, despite the Canadian Dental Association recommending adults have at least one dental visit a year for preventive purposes. Few studies indicate that immigrants, particularly recent immigrants, are less likely to have preventive dental care visits as compared with the native-born in Canada (Bedos et al., 2004; Newbold & Patel, 2006). These findings point to recent immigrants' lack of preventive dental care utilization as an

important explanation for their declining oral health in the host society. Therefore, it is critical to explore immigrants' preventive dental care utilization within the first few years of arrival. As mentioned before, contemporary immigrants are largely from non-European regions such as Asia, Latin America, the Caribbean, and Africa. Despite their diverse characteristics, the literature on immigrant health often treats recent immigrants as a homogeneous group. This is concerning because non-European recent immigrants are more likely to face social, cultural, linguistic, and economic challenges than their European counterparts (Reitz & Banerjee, 2009). The Longitudinal Survey of Immigrants to Canada (LSIC) provides a unique opportunity to address this limitation. Drawing theoretical insights from Reitz' institutional framework (1998, 2002), Chapter 4 examines the potential disparity in preventive dental care utilization between newly arrived immigrants of non-European and European backgrounds, respectively (specifically, those who have been in Canada for four years).

Findings from the logistic regression analysis reveal that newly arrived immigrants from West Africa, East Africa, North Africa, Central Asia/the Middle East, East Asia, and South Asia are less likely to utilize preventive dental care utilization than those from West/North Europe. Importantly, the lower rates for Central Asia, the Middle East, and East Asia are largely explained by social, cultural, and linguistic characteristics such as the number of co-ethnic friends, a preference for co-ethnic health care providers, and language proficiency. As highlighted by Reitz's institutional framework, Canada actively recruits immigrants from many world regions, with those coming mostly outside of Europe. It is possible that non-European immigrants, such as those from Central Asia, the Middle East, and East Asia, engage less in preventive dental care if their social networks value traditional medicine or perceive other life tasks or events as being more important than dental care (Choi, 2011; Woltman & Newbold, 2007). With respect to the preference for co-ethnic health care providers and language proficiency, some non-European immigrant groups may be exposed to cultural and linguistic barriers to dental care utilization. For example, Dong et al. (2011) find that it is difficult for some Chinese immigrants to trust dentists of Western origins, as their cultural understandings about oral health are different. Similarly, the unavailability of professional dental care interpreters is problematic for many immigrants (Bowen, 2008). These findings suggest that the lack of

culturally and linguistically competent dental care may contribute to the disparity in preventive dental care utilization between newly arrived immigrants of European and non-European origins, specifically those from Central Asia, the Middle East, and East Asia.

In addition to social, cultural, and linguistic barriers, the analysis points to financial barriers that exclude non-European newly arrived immigrants from preventive dental care utilization. Specifically, economic factors such as perceived financial well-being, dental insurance, and household income partly explain the lower rates of preventive dental care utilization among non-European immigrants, including West/East Africans, North Africans, Central Asians, Middle Easterners, and South Asians. This finding can be explained by Reitz's institutional framework, which shows that under-/non-recognition of foreign human capital and racial discrimination may be critical barriers to the labour market integration of racial minority recent immigrants. Consistent with this argument, it is widely determined that non-European immigrants are more likely to face economic challenges in the host society, such as unemployment, precarious employment, low income, and poverty (Buzdugan & Halli, 2009; Nakhaie & Kazemipur, 2013).

Chapter 4 theoretically contributes to the literature on health care utilization. Andersen's behavioural model of health care utilization is one of the most widely applied frameworks. However, it is argued that this model often overlooks structural barriers to health care utilization among vulnerable groups, including immigrants (Choi, 2011; Gelberg, Andersen & Leake, 2000; Yang & Hwang, 2016). This chapter adopts Reitz's institutional approach to immigrant integration to demonstrate the mechanisms in which non-European newly arrived immigrants face more structural barriers to preventive dental care utilization as compared to European immigrants in Canada. For example, due to changes in immigration regulations in the 1960s, immigrant source regions have shifted to Europe to non-European regions including Asia, Africa, Latin America, and the Caribbean. Although many recent immigrants have different cultural and linguistic values from the native-born, research shows that Canada often lacks cultural and linguistic competent dental care services (Bowen, 2008). In this context, the lower rates of dental

care utilization among immigrants from Central Asia, the Middle East, and East Asia should be understood in relation to Canada's immigration policy and dental care system. Similarly, as highlighted in Chapter 3, dental care is treated as a privilege in Canada. This institutional barrier is particularly important in explaining the disparity in preventive dental care utilization between European and non-European immigrants who are often exposed to under-/non-recognition of foreign human capital and racial discrimination in the mainstream labour market. Therefore, it is important to integrate the institutional characteristics such as labour market structure, ethnic and racial relations, and welfare regime as part of the discussion surrounding the subject of immigrants' dental care utilization.

5.2 What is the big picture? Some policy recommendations

Consistent with the healthy immigrant effect, this dissertation shows that the oral health of immigrants declines over time in Canada. This is concerning because this pattern is also found with physical health. As evidence points to the systemic linkage between oral health and physical health, policymakers should pay close attention to immigrants' oral health. It is also important to revisit the main theoretical ideas in this dissertation. For example, the social determinants of oral health framework recognizes social inequality as a driver of poor oral health. Coupled with this framework, Beiser (2005) introduces two approaches to understanding the health of immigrants, specifically the convergence and resettlement stress perspectives. Consistent with the resettlement stress perspective, Chapter 2 reveals structural factors such as household income adequacy and dental care utilization as important explanations for immigrants' declining oral health over time. By contrast, certain lifestyle choices made by immigrants, such as drinking and smoking, do not explain the disparity. As argued by Watt (2007), a 'victim blaming' approach that focuses on individuals' lifestyle choices may be less effective as a basis for oral health interventions to improve immigrants' oral health. Instead, such interventions should focus on addressing social and economic inequalities, including the unequal distributions of economic and dental care resources between immigrants and the native-born.

This dissertation further demonstrates the institutional environments in which immigrants are structurally excluded from dental insurance coverage and dental utilization in Canada. The unequal economic positioning may serve as a major barrier for dental insurance coverage and preventive dental care utilization among recently arrived immigrants, especially those from non-European regions. According to Reitz (1998, 2002), such economic inequality is derived from several institutional characteristics, including immigration policy, labour market structure, and ethnic and racial relations. With the expansion of post-secondary education in Canada, the number of the native-born population with a university education has dramatically increased. Although contemporary immigrants are predominantly highly skilled, job candidates with Canadian human capital may still be preferred by employers. Racial minority immigrants, which make up the majority of recent immigrant arrivals, also face labour market discrimination. These labour market challenges need to be understood in the context of the private dental care system, where economically vulnerable immigrants face financial barriers to dental care utilization. However, Canada's dental care system does not recognize immigrants as an economically vulnerable group, and immigrants are eligible for government-assisted dental insurance only if they participate in social welfare programs. Considering that social welfare participation is less common among immigrants than the native-born (Smith-Carrier & Mitchell, 2015), it is possible that economically vulnerable immigrants face unique barriers to obtaining dental insurance. Therefore, oral health intervention programs are needed to address the relative economic vulnerabilities of immigrants and especially non-European newly arrived immigrants. It is also crucial to effectively remove the financial barriers to dental care utilization. Considering the link between oral health and physical health, it is curious as to why Canada excludes dental care from its universal healthcare system. The Canada Health Act (section 3) after all aims 'to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers'. The inclusion of dental care into the publicly funded health care offering may be a useful way to increase the uptake of preventive dental care utilization among economically vulnerable groups, including immigrants. If dental care remains privately financed, however, policymakers need to pay attention to the disparity in dental insurance coverage

between immigrants and the native-born. Potentially, income-based assisted dental care programs, instead of social welfare programs, could better address immigrants' economic vulnerability in dental care.

This dissertation also recognizes social, cultural, and linguistic barriers as sources of disparity in preventive dental care utilization between European and non-European newly arrived immigrants, including those from Central Asia, the Middle East, and East Asia. Since the change in immigration policy in the late 1960s, Canada has recruited highly skilled immigrants and their families from many non-European regions, including Asia, Latin America, the Caribbean, and Africa. Accordingly, many recent immigrants have social, cultural, and linguistic characteristics uniquely different from those of European immigrants and the native-born. Framing dental care as a type of social welfare, the literature shows that dental care often overlooks the importance of dental care that is sensitive to cultural and linguistic differences, excluding many immigrants from accessing preventive dental care utilization. Hence, policymakers should focus on disseminating information about dental care in ethnic institutions, such as churches, grocery stores, schools, barber shops, and restaurants. Also, it is important to provide language interpreters in the field. Finally, the number of visible minority and immigrant dental care professionals should be increased to meet the needs of cultural and linguistic minority immigrants.

5.3 Limitations and directions for future research

There are some limitations to each integrated article in this dissertation. Although Chapter 2 reveals immigrants' declining oral health in Canada, the results are limited by the use of the CCHS, which is a cross-sectional survey. Due to the change in immigration policy that occurred in the late 1960s, immigrants from earlier cohorts may have different economic, social, and cultural characteristics as compared with more recent immigrants (Akbari & MacDonald, 2014). In addition, the relationship between health status and the social environment is not static but rather dynamic, pointing to the importance of understanding the intra-individual nature of oral health changes over time (Pavalko & Willson, 2011). Similarly, Chapter 3 is also limited by the use of the CCHS. It would

have been ideal to track the same individuals over time to situate dental insurance coverage within the institutional context of immigrant integration. However, the availability of longitudinal information about oral health is very limited in Canada. Chapters 2 and 3 highlight the vulnerabilities of recent immigrants in the context of self-rated oral health and dental insurance coverage. In this regard, although its sample is limited to newly arrived immigrants, the use of the LSIC would be recommended to further document the determinants of self-rated oral health and dental insurance coverage among newly arrived immigrants. Findings from such investigations would provide potentially valuable policy implications, which would be useful in mitigating immigrants' oral health problems at the early stages of their settlement.

In addition, as an optional module, the CCHS does not include oral health information from all of the provinces. As a result, Chapters 2 and 3 only analyze immigrants and the native-born in Ontario, Canada. As such, it is useful to extend the analysis to include other provinces because there is an increasing political interest in the regionalization of immigrants as a means to address the unequal population distribution between traditional and non-traditional gateway cities. It is important to examine whether immigrants fare similarly in terms of oral health, dental care coverage, and dental care utilization in more popular settlement destinations such as Ontario and less popular places of settlement such as Atlantic Canada. As more than 60% of immigrants settle in Montreal, Toronto, and Vancouver (MTV), future research should compare oral health and its related behaviours between immigrants in the MTV and those outside the MTV, once the CCHS collects oral health information at the national level.

Chapter 2 also solely relies on self-rated oral health. This may be a limitation because research shows that there is a discrepancy between clinical and self-rated evaluations of oral health among immigrants (Ghiabi et al., 2014). Oral health may also be culturally constructed among immigrants (Butani, Weintraub & Barker, 2008). For example, Chinese and Taiwanese immigrants understand their oral health as based on cultural causes of illness, commonly known as 'yin and yang' (Jiang & Quave, 2013). Yet, the CCHS and LSIC do not address immigrants' cultural constructions of oral health. cultural and ethnic minority immigrants is expected to keep rising in Canada. Taking

these concerns into consideration, in-depth qualitative research is needed to unpack immigrants' cultural constructions of oral health and the relation to self-rated oral health. Specifically, future research should document immigrants' voices on how the cultural constructions of oral health change over time after the arrival and how such changes inform oral health.

5.4 References

Abraham, J. M., Vogt, W. B., & Gaynor, M. S. (2006). How do households choose their employer-based health insurance? *INQUIRY*, *43*(4), 315-332.

Akbari, A. H., & MacDonald, M. (2014). Immigration policy in Australia, Canada, New Zealand, and the United States: An overview of recent trends. *International Migration Review*, *48*(3), 801-822.

Bedos, C., Brodeur, M., Benigeri, M., & Olivier, M. (2004). Utilization of preventive dental services by recent immigrants in Quebec. *Canadian Journal of Public Health*, *95*(3), 219–223.

Beiser, M. (2005). The health of immigrants and refugees in Canada. *Canadian Journal of Public Health*, *96*(2), S30-S44.

Blomqvist, A., & Woolley, F. (2018). *Filling the Cavities: Improving the Efficiency and Equity of Canada's Dental Care System*. C.D. Howe Institute Commentary 510. Toronto, ON: C.D. Howe Institute.

Bowen, S. (2008). Providing care in a changing society: what do health care providers really need to know about cultural diversity? *Canadian Journal of Dental Hygiene*, *42*(2), 108-113.

Butani, Y., Weintraub, J. A., & Barker, J. C. (2008). Oral health-related cultural beliefs for four racial/ethnic groups: Assessment of the literature. *BMC Oral Health*, *8*(1), 26.

Buzdugan, R., & Halli, S. S. (2009). Labor Market Experiences of Canadian Immigrants with Focus on Foreign Education and Experience. *International Migration Review*, *43*(2), 366-386.

Calvasina, P., Muntaner, C., & Quiñonez, C. (2015). The deterioration of Canadian immigrants' oral health: analysis of the Longitudinal Survey of Immigrants to Canada. *Community Dentistry and Oral Epidemiology*, *43*(5), 424-432.

Choi, S. (2011). A critical review of theoretical frameworks for health service use among older immigrants in the United States. *Social Theory & Health*, *9*(2), 183-202.

De Maio, F. G. (2010). Immigration as pathogenic: a systematic review of the health of immigrants to Canada. *International Journal for Equity in Health*, *9*(1), 27.

Dong, M., Levine, A., Loignon, C., & Bedos, C. (2011). Chinese immigrants' dental care pathways in Montreal, Canada. *Journal of the Canadian Dental Association*, *77*, b131.

Frank, K., Phythian, K., Walters, D., & Anisef, P. (2013). Understanding the economic integration of immigrants: A wage decomposition of the earnings disparities between native-born Canadians and recent immigrant cohorts. *Social Sciences*, *2*(2), 40-61.

Gee, E. M. T., Kobayashi, K. M., & Prus, S. G. (2004). Examining the healthy immigrant effect in mid-to later life: findings from the Canadian Community Health Survey. *Canadian Journal on Aging*, *23*(5), S55-S63.

Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*, *34*(6), 1273-1302.

Ghiabi, E., Matthews, D. C., & Brillant, M. S. (2014). The oral health status of recent immigrants and refugees in Nova Scotia, Canada. *Journal of Immigrant and Minority Health*, *16*(1), 95-101.

Girard, M., & Smith, M. (2013). Working in a regulated occupation in Canada: An immigrant-native born comparison. *Journal of International Migration and Integration*, *14*(2), 219-244.

Hum, D., & Simpson, W. (2004). Economic integration of immigrants to Canada: A short survey. *Canadian Journal of Urban Research*, *13*(1), 46-61.

Jiang, S., & Quave, C. L. (2013). A comparison of traditional food and health strategies among Taiwanese and Chinese immigrants in Atlanta, Georgia, USA. *Journal of Ethnobiology and Ethnomedicine*, *9*(1), 61.

Kazemipur, A., & Halli, S. S. (2001). The changing colour of poverty in Canada. *Canadian Review of Sociology*, *38*(2), 217-238.

Meyer, M. H., & Pavalko, E. K. (1996). Family, work, and access to health insurance among mature women. *Journal of Health and Social Behavior*, *37*(4), 311-325.

Montez, J. K., Angel, J. L., & Angel, R. J. (2009). Employment, marriage, and inequality in health insurance for Mexican-origin women. *Journal of Health and Social Behavior*, *50*(2), 132-148.

Nakhaie, M. R., & Kazemipur, A. (2013). Social capital, employment and occupational status of the new immigrants in Canada. *Journal of International Migration and Integration*, *14*(3), 419-437.

Newbold, K. B., & Patel, A. (2006). Use of dental services by immigrant Canadians. *Journal of the Canadian Dental Association*, *72*(2), 143.

Ngo, G., Trope, G., Buys, Y., & Jin, Y. P. (2018). Significant disparities in eyeglass insurance coverage in Canada. *Canadian Journal of Ophthalmology*, *53*(3), 260-265.

Ngwakongnwi, E., Hemmelgarn, B. R., Musto, R., Quan, H., & King-Shier, K. M. (2012). Experiences of French speaking immigrants and non-immigrants accessing health care services in a large Canadian city. *International Journal of Environmental Research and Public Health*, *9*(10), 3755-3768.

Noack, A. M., & Vosko, L. F. (2011). *Precarious jobs in Ontario: Mapping dimensions of labour market insecurity by workers' social location and context*. Toronto: Law Commission of Ontario.

Pavalko, E., and Willson, A. (2011). Life course approaches to health, illness and healing. In B. Pescosolido, J. Martin, J. McLeod, & A. Rogers (Eds.), *Handbook of the Sociology of Health, Illness, and Healing* (pp. 449-464). New York, NY: Springer.

Petersen, P. E., Bourgeois, D., Ogawa, H., Estupinan-Day, S., & Ndiaye, C. (2005). The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization*, *83*(9), 661-669.

Petersen, P. E., & Kwan, S. (2011). Equity, social determinants and public health programmes–the case of oral health. *Community Dentistry and Oral Epidemiology*, *39*(6), 481-487.

Reitz, J. G. (1998). *Warmth of the Welcome: The Social Causes of Economic Success for Immigrants in Different Nations and Cities*. Boulder, CO: Westview Press.

Reitz, J. G. (2002). Host societies and the reception of immigrants: research themes, emerging theories and methodological issues. *International Migration Review*, *36*(4), 1005-1019.

Reitz, J. G., & Banerjee, R. (2009). Racial inequality and social cohesion. In J. G. Reitz, K. K. Breton, & K. L. Dion (Eds.), *Multiculturalism and social cohesion: Potentials and challenges of diversity* (pp.123-155). New York, NY: Springer.

Reitz, J. G., Curtis, J., & Elrick, J. (2014). Immigrant skill utilization: Trends and policy issues. *Journal of International Migration and Integration*, *15*(1), 1-26.

Royalty, A. B., & Hagens, J. (2005). The effect of premiums on the decision to participate in health insurance and other fringe benefits offered by the employer: evidence from a real-world experiment. *Journal of Health Economics*, *24*(1), 95-112.

Sheiham, A., & Watt, R. G. (2000). The common risk factor approach: a rational basis for promoting oral health. *Community Dentistry and Oral Epidemiology: Commentary*, *28*(6), 399-406.

Smith-Carrier, T., & Mitchell, J. (2015). Immigrants on social assistance in Canada: Who are they and why are they there? In D. Béland & P-M. Daigneault (Eds.), *Welfare reform in Canada: Provincial social assistance in comparative perspective*. (pp. 305-322). Toronto, ON: University of Toronto Press.

Vang, Z. M., Sigouin, J., Flenon, A., & Gagnon, A. (2017). Are immigrants healthier than native-born Canadians? A systematic review of the healthy immigrant effect in Canada. *Ethnicity & Health, 22*(3), 209-241.

Watt, R. G. (2007). From victim blaming to upstream action: tackling the social determinants of oral health inequalities. *Community Dentistry and Oral Epidemiology*, *35*(1), 1-11.

Woltman, K. J., & Newbold, K. B. (2007). Immigrant women and cervical cancer screening uptake: a multilevel analysis. *Canadian Journal of Public Health*, *98*(6), 470-475.

Yang, P. Q., & Hwang, S. H. (2016). Explaining immigrant health service utilization: A theoretical framework. *Sage Open*, *6*(2), 1-15.

Curriculum Vitae

Name:	Yujiro Sano
Post-secondary Education and Degrees:	University of Arizona Tucson, AZ, USA 2008-2012 B.A. Memorial University of Newfoundland St. John's, NL, Canada 2012-2014 M.A. University of Western Ontario London, ON, Canada 2014-2018 Ph.D. (Candidate)
Honours and Awards:	Best Student Paper Award, Centre for Research in Social Inequality, University of Western Ontario 2018 Richard Konrad Ontario Graduate Scholarship 2016 Outstanding Graduate Student Award, Canadian Sociological Association 2015 ISER Master Fellowship, Institute of Social and Economic Research, Memorial University of Newfoundland 2013
Related Work Experience:	Research Assistant University of Western Ontario 2016-2018 Teaching Assistant University of Western Ontario 2014-2016