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Welfare State and Health Disparity Among Immigrants and Native-born in the US and Canada

By

Peilin Yang

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Faulty Advisor: Linda J. Waite
Preceptor: Amit Anshumali

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Abstract

The welfare state regime is often generalized across labor market and healthcare policy areas in the study of welfare states and health. This study separates labor market and healthcare welfare state benefits to better understand the effect of healthcare welfare on self-perceived health. Also, immigrant health has been a blindspot for the study of the effect of the welfare state on health, especially in the cross-national context. This study uses Canadian Community Health Survey and National Health Interview Survey to study the overarching question: whether social determinants of health outlined by the fundamental cause of disease theory, education, employment status, and household income are associated with perceived health in the same way for Canadians (liberal labor market welfare with universal healthcare) and Americans (liberal labor market welfare and healthcare). Then, the study looks at whether the association between social determinants of health affects native-born and immigrants in the same way or differently and how Canadian immigrants stack up against American immigrants. The study shows that the theory of the fundamental cause of disease holds even in Canada, where universal healthcare exists. However, the income health gradient is not as steep for Canadian immigrants than for US immigrants, suggesting that income matters less for the health of Canadians than Americans. Immigrant groups of both countries see smaller income-related health inequalities than their native-born population.

Introduction

The study of social determinants of health has gained considerable traction in recent years. Among them, the theory of the fundamental cause of diseases proliferated. The fundamental cause of disease states that studying the ever-changing risk factors in the search for an answer to health differentials is unproductive because of their dynamic natures. Link and Phelan (1995) claim that instead of looking at risk factors, socioeconomic status (SES) and social support are the fundamental causes of diseases because they allow access to flexible resources that enable people to avoid diseases or bad outcomes. In fact, our increasing ability to manage disease and control death couples with existing socioeconomic inequality enabled those with resources, power, prestige, and social connections to access the best care and treatment (Phelan and Link 2005). However, the theory's assumption is largely based on the US context. Less is known about whether the fundamental cause of diseases and health disparities exists in a country with universal healthcare. In addition, while a positive association between SES and health is well established in many countries, multiple studies claim that the relationship between SES and health is more mixed for immigrants and racial minorities (Sánchez-Vaznaugh et al. 2009, Kimbo et al. 2008, Leu et al. 2008). Thus, the study askes, how do the effects of fundamental causes look for the native-born population and immigrants in countries with or without universal healthcare? In order to explore these questions, this study compares the US and Canada.

Past studies on immigrant health has focused on countries that receive a large number of immigrants (e.g., Australia, Canada, and the US) with a specific emphasis on individual or cultural behaviors like smoking, drinking, diet and quantifiable acculturation measures like immigrant generation, language fluency, the number of years since immigration, etc (Viruell-Fuentes et al. 2012). However, Viruell-Fuentes et al. (2012) and many other scholars

contend that the focus on culture can mask the effect of structure on immigrant health, including socioeconomic status, systemic racism, and immigration/health policy. In fact, in studies of non-immigrants, research on the causes of health disparity often focuses on structural explanations deemed as social determinants of health, for example, income, education, housing, work environment, etc. (Dahlgren and Whitehead 1991). There seems to be a disconnect between the study of health for native-born (or overall population) and the immigrant population, where scholars resort to different sets of explanations when in reality, the factors that shape native people's health can affect immigrants, if not affect immigrants differently. This study bridges the gap between the study of social determinants of health and immigrant health by focusing on educational attainment, employment status, household income, and their relationship with immigrant health. In addition, this study engages with the fundamental cause theory and the welfare state to understand how SES gradient of health in Canada, a country with universal healthcare, compares to the US, which lacks such a policy, and whether the theory of fundamental cause holds in Canada.

Background

Policies of different kinds, such as immigration policy, labor market, and health policies, can affect health disparities (House et al. 2008). Prior studies on immigrant health comparing Canada and the US demonstrate that immigration policy has a considerable role in immigrant health at the time of landing and can have implications for the long term (Antecol et al. 2003, Lu et al. 2017).

Immigrant Policies' Association with Immigrant Health

Lu et al. (2017) explain that there is a fundamental difference in health screening processes for immigrants in Canada and the US. While Canada screens for chronic health

conditions that can incur excessive demands and costs in the healthcare system, the US health screening focuses more on public health risks, mental health, and substance abuse problems and places much less, if any, emphasis on chronic health conditions. Lu et al. (2017) found that Canada has healthier immigrants than the US at the time of landing.

In the long term, the health of immigrants can be associated with the type of immigration program the immigrant goes through. In a study comparing the skill levels of immigrants, Antecol et al. (2003) find that the Canadian points system for immigration tends to attract more skilled immigrants than the US family reunification-driven immigration policy. The Canadian points system evaluates immigrants based on their education, language fluency, investment prospect after landing, etc., while the US immigration policy evaluates immigrants based on the closeness to the sponsoring American citizen or permanent resident. This results in Canada having immigrants who are more fluent in native languages (French or English in Canada) than in the US (English in the US). Antecol et al. (2003) found that even though the gap for language fluency reduces after 15-20 years, Canada is still more advantageous in the long term. In addition, American immigrants also show a more significant deficit to US native population in both education and income compared to Canadian immigrants. Given the understanding that social determinants of health like income and education can affect one's health outcomes, I suspect that these immigrant characteristics resulting from the immigrant policy can have a long-term effect on immigrant health.

Labor Market and Healthcare Welfare State's Association with Health

Despite immigration policy's direct effect on immigrant selectivity and immigrant health for the landed immigrants, this study is mainly interested in the labor market and healthcare policy contexts' effect on immigrant health. The story of immigrants' health does not pause at

the time of landing. In fact, they constantly interact with the labor market and the healthcare system. Therefore, this study acknowledges that access to healthcare and labor market benefits can affect immigrant health, just like how they influence native-born's health.

Welfare state policy can affect people's health and health disparities in numerous ways. When discussing the welfare state, one often refers to one of the most cited "The Three Worlds of Welfare State Capitalism" by Esping-Anderson (1990). Esping-Anderson (1990) conceptualizes the welfare state as its ability to decommodify in a capitalist society, meaning the degree of dissociation between income and living standards. Decommodification can occur in various areas in life. For example, unemployment benefits can act as a safety net during a market downturn. Easy access to safe water, housing, and nutritious food may affect people's health in the long term. Access to free education may allow people the opportunities on the job market to earn a living or help people understand and avoid risky behaviors. Easy access to affordable healthcare is crucial for addressing unmet health needs (Bambra and Beckfield 2012). While all of these welfare areas affect people's health in numerous ways, by no means can they be assumed to be consistently generous or not generous across the board.

While Esping-Anderson (1990) focuses on labor market welfare decommodification, Bambra (2007) focuses on the healthcare welfare decommodification. In the case of Bambra (2007), the welfare state is evaluated based on three measures: the percentage of private health spending in the overall GDP, the percentage of private hospital beds in the overall bedstock, and the percentage of people that fall under the healthcare system. Liberal means a more privatized healthcare system, while social democratic means a more state intervention-driven healthcare system[1]. Comparing the Esping-Anderson (1990) and the Bambra's (2007) welfare state

[1] Liberal, conservative, and social democratic welfare states stand for different meanings to the US political parties. Liberal means less generous welfare. Social democratic stands for more generous welfare.

typology, a stark difference appears between Canada and the US. While the US and Canada were both categorized as liberal welfare state regimes in the Esping-Anderson model, Canada was categorized as a social democratic state in the Bambra (2007) model, which stands on the polar opposite of the US.

Canada and the US are running on two different healthcare systems. The Canadian healthcare system is operated on a publicly funded system, which eliminates the cost of care except for dental care and prescription drugs (Zuberi 2006 cited by Lu et al. 2017). A study by Ross et al. (2000 cited by Lu et al. 2017) has shown that the system reduces barriers to access to care and returns in fewer health disparities. On the other hand, the US only employs public-funded health insurance for the elderly, poor, military personnel, veterans, etc. (Lu et al. 2017). Even with the implementation of the Patient Protection and Affordable Care Act (PPACA), which is also known as Obamacare, health insurance is still purchased through private insurance, though with tax credit compensation for those eligible and better coverage by enrolling people with preexisting conditions (Lu et al. 2017, Silver 2013). Despite the effort, about 20% of immigrants were still uninsured by 2017, compared to 7% of the native population (Esterline and Batalova 2022).

This Study's Contribution to the Understanding of Welfare State and Health

The studies that include the welfare state in the conversation tend to fall short in several ways. Olafsdottir's (2007) study uses the welfare state in the economic sense, positing that economic policies shape capitalism's stratification process, affecting people's vulnerability in a market downturn or less ideal life events. Therefore, Olafsdottir engages with Esping-Anderson's "three worlds" of welfare capitalism, comparing the US, on the liberal end of the welfare state, and Iceland, on the social democratic end of the welfare state regime regarding economic

policies. However, Iceland also has universal healthcare, which confounds the relationship between the economic welfare state and health outcomes. Though I think there is a lot to take away from the study, it was not clear whether it was the economic or the healthcare welfare state that is shaping Icelander's health differently from Americans.

Departing from many previous studies that have a homogeneous view of the welfare state, this study separates the labor market welfare state and healthcare welfare state (Bambra 2005, Kasza 2002). Olafsdottir and Beckfield (2011) show that while Scandinavian countries exhibit homogeneity in their welfare state approach in most areas, countries like the UK demonstrate heterogeneity in their approach to labor market policies (less generous) and healthcare (more generous). In fact, they argue that few studies have made an effort to incorporate healthcare into the welfare state consideration. Canada and the US make a great comparison because Canada is heterogeneous in its welfare state approach. Like the US, Canada is categorized as the least generous in labor market policy by Esping-Anderson (1990). Where they differ is that Canada has universal healthcare and is categorized as the most generous healthcare welfare state by Bambra (2005, 2006, 2007) using the same decommodification methods as Esping-Anderson. A comparison between Canada and the US allows us to control the labor market welfare state to better understand the effect of the healthcare welfare state.

I add to Olafsdottir's study by employing Bambra's (2005, 2006, 2007) healthcare-focused welfare state category, mirroring the decommodification model of Esping-Anderson. I opt to compare Canada and the US because Canada exists in the liberal economic welfare state regime in the Esping-Anderson's model but the social-democratic healthcare welfare state regime in Bambra's model. Suppose we see a notable difference between Canada and the US in social determinants of health's effect on health outcomes and disparities.

In that case, it indicates that universal healthcare, indeed, improves health outcomes. On the other hand, if no observable difference is seen in SES's relationship with health between the two countries, it is likely that universal healthcare does not affect the SES health gradient. The interest of this study lies in comparing two countries with similar economic welfare states but drastically different healthcare welfare states to see if notable differences between the two countries exist and whether universal healthcare improves nations' health and reduces inequalities.

How does Socioeconomic Status (SES) Fit in the Discussion of Health?

The SES variables in this study developed from the theory of the fundamental cause of disease. Phelan and Link have been engaging with the fundamental cause of health disparities (Link and Phelan 1995, Phelan and Link 2005) and, more recently, studying whether racism is the fundamental cause of health disparity in the US context (Phelan and Link 2015). They contend that if X is the fundamental cause of Y, Y will persist even if the causal mechanisms between X and Y are addressed because the root cause of X is not adequately dealt with. In the context of SES and health disparity, racism would be the fundamental cause of health disparity if addressing the risk factors for diseases does not eliminate health disparity.

Phelan and Link (2005) contend that educational attainment, employment status, and income are the fundamental cause of diseases. They argue that during the rise in medical technology and death control, certain people are able to use power, prestige, money, and social connections to gain health advantage. The differentiators that create health inequalities are education, employment status, and income (Phelan and Link 2005). Higher educational attainment allows one to be better at navigating the social system, including the healthcare system, and more avenues of information access (Deaton 2002, Mirowsky and Ross 2015).

Employment not just predicts the income stream but also the psychological effect because unemployment can have stigmas attached to it (Bambra and Beckfield 2012). Income allows one to afford health insurance and pay for medical bills (Lasser et al. 2006).

To better reflect and understand the potential research findings in the research outcomes, I argue that fundamental cause theory should not be understood in binary: whether one variable is or is not the fundamental cause nor be determined by whether the undesirable outcome is completely eliminated (e.g., eliminate health disparities by income, eliminate health disparities by race). In the research agenda that Bambra and Backfield (2012) introduced, they cited Bambra and Eikeno's (2008) study on the relationship between unemployment and health to stress the importance of observing the magnitude of the relationship between unemployment and health in different welfare states. This study emphasizes examining the magnitude of the relationship and how the magnitude shifts in different welfare states. I contend that this is a more productive way to approach a question regarding fundamental causes.

Conceptualizing Immigrant Health

While some studies try to break down the population into subpopulation groups like insured and uninsured groups, white versus non-white Americans (e.g. Olafsdottir 2007, Lasser et al. 2006), there seems to be a lack of studies examining the welfare state's impact on population subgroups such as immigrant and gender as part of the main analytical agenda. This study incorporates immigrant groups to understand how social determinants of health shape health outcomes in Canada and the United States.

Despite the aforementioned immigrant policies, immigration programs, labor market, and healthcare policies' effect on immigrant health at the time of landing, and in the long term, there

may be other factors that are not accounted for that might also have an impact on immigrant health and SES health gradient.

Firstly, social connections among immigrants can be different from those of the native-born population. Hagan's (1998) study on immigrant social networks reveals that immigrants, especially new immigrants, tend to rely on "strong ties" like family, kin-based, and coethnic group connections (Granovetter 1973). Though these connections can alleviate immigrants' stress in the initial settlement, they can impede the making of connections with people outside of their family and coethnic group, also known as "weak ties" (Granovetter 1973). According to Hagan's (1998) finding, the weak ties that are formed at work and other social settings for some immigrants can have positive impacts, such as helping undocumented immigrants legalize their status. Weak ties were also found to be important in upward mobility, health, and job access (Granovetter 1973, Berkman and Breslow 1983, Wilson 1987). The presumed fewer weak ties among immigrants regardless of income, education, and employment status can disadvantage even the relatively high SES immigrants.

Secondly, when moving from another country, immigrants have to re-establish themselves socially and financially despite bringing some of their previous wealth with them in the process. Sheth et al. (1999) show that Canadian immigrants can take around ten years to establish themselves financially. This finding suggests that SES measures of new immigrants can have different implications than the native-born population because new immigrants' full SES potential may not have been achieved. Conversely, because it takes time for immigrants to establish themselves financially, immigrants can be burdened with the cost of care if the cost is high. Studies on immigrant healthcare access in the US show less healthcare use among

documented and undocumented Mexican immigrants (Ortega et al 2007, Bustamante et al. 2010). This can further indebt immigrants in the process of transition.

Lastly, health risk behaviors among immigrants and the SES risk behavior gradient can also have implications for immigrant SES health gradient. A previous study by Petrovic et al. (2018) found that risk behaviors in North America and Scandinavian countries contribute more to the steeper SES health gradient than in many central and Southern European countries. This means that as socioeconomic status increases, we also see a gradual decline in engagement with health risk behaviors. Though the association between risk behaviors and SES is unclear among immigrants, Blue and Fenelon (2011) found that smoking explains a large part of immigrants' health advantage over the native-born US population. Kuerban (2016) also notes that Asian immigrants smoke less than their native-born counterparts. These findings suggest that if immigrants largely engage in fewer risk behaviors regardless of SES, the SES health gradient can be smaller among immigrant groups than the native-born group.

Past Studies of Welfare State and Health

The welfare state and health studies focused on either aggregate health measures or individual characteristics. For studies on aggregate measures, Coburn (2004) found that countries affiliated with liberal welfare states tend to have more poverty, income inequality, and health inequality. On the other hand, countries with social democratic welfare state regimes tend to have better health (in terms of high life expectancy, low infant mortality rate, potential years of life lost, and lower-income health gradient) than countries with liberal welfare state regimes. Another study by Ross et al. (2000) comparing the relationship between income inequality and mortality in the US and Canada found that while the US shows a significant linear relationship between income inequality and mortality, this relationship is not significant for Canada. They

suggest that the relationship between income inequality and mortality could be non-linear in Canada, or there could be policy in Canada that can counter income health gradients.

Other studies on the welfare state and health that focus more on individual-level measures, specifically social determinants of health, show mixed findings. Namely, Bambra (2011) calls the mixed finding Scandinavian welfare puzzle where Scandinavian countries would exhibit more SES health gradients than other European countries with less generous welfare states. A study by Eikemo et al. (2008) examined the relationship between inequality in education and health disparity in 23 European countries. In general, their finding suggests that countries with lower average education have higher rates of ill-health. However, their findings are more mixed when they include the welfare state into the picture. Although they found a pattern that education inequality does vary across welfare state regimes systematically, people within the Scandinavian welfare state experience more educational health disparity than less generous Anglo-Saxons welfare states. They attribute this finding to the recent influx of immigrants who can be marginalized from the welfare benefits. They also suggest that they are among the least educated people in those countries. Another study by Eikemo et al. (2008) finds a similar puzzling pattern in the income health gradient between the Scandinavian welfare state. Another study by Mackenbach et al. (2008) on inequality in socioeconomic status and health in 22 countries in Europe also reflects the Scandinavian paradox. Though they did not examine the welfare state regime as the study's main agenda, they discovered that in Italy and Spain, where the welfare state is less generous, there is also less inequality in mortality than in the northern European countries where the welfare state is more generous. They also did not find evidence of less inequality in health in the northern European countries where the welfare state had been

more generous. They attributed those counterintuitive findings to cultural factors such as diet and lifestyle risks like smoking and drinking.

Olafsdottir (2007) compared Iceland and the United States, representing social democratic and liberal welfare state regimes, in Esping Anderson's model. The study shows that relative poverty, employment, and education have comparable effects on health in both countries. However, relative affluence was found to be not as strongly associated with health in Iceland as in the United States, suggesting that a more generous welfare state regime might reduce health disparities by curtailing advantages up top instead of improving the health of those at the bottom. She also found that being a parent is more strongly associated with better health in Iceland than in the United States, further showing the labor benefit's redistributive nature of Iceland's more generous welfare state.

Studies on the Health of Overall and Immigrant Population in Canada and the US

Studies comparing the US and Canada observe differences in health status according to income gradient, race, and immigration status (Lasser et al. 2006, Humphries and van Doorslaer 2000). While Lasser et al. (2006) found that health disparities are larger in the US than in Canada, Humphries and van Doorslaer (2000) found that the income gradient of health in Canada is comparable to that of in the UK and the US. Lasser and colleagues (2006) contend that people in the US are less likely to have a doctor, more likely to have unmet health needs, and more likely to give up needed medicines for various reasons compared to their Canadian counterparts. Also, people in the US and Canada forgo care for different reasons: people in the US have turned away from care because of cost, while Canadians are turned away by the long wait time (Lasser et al. 2006).

Canadian research on immigrants follows the healthy and sick immigrant paradigms. For the most part, researchers tend to support the latter. Researchers find robust evidence for healthy immigrant effects. More specifically, immigrants are less likely to have chronic conditions and have better mental health than native-born Canadians (McDonald and Kennedy 2004, Lou and Beaujot 2005). Some have reported mixed results for self-rated health. McDonald and Kennedy (2004) find little advantage for immigrants compared to the native-born population regarding self-perceived health. Lu and Ng (2019) only observe a healthy immigrant effect on self-perceived health for certain groups after adjustment for socioeconomic status and other health factors. Newbold and Danforth (2003) find contradictory results that immigrants are more likely than native-born Canadians to report poor health. In fact, they used subjective and objective measures to show that immigrants tend to have lower health standards regarding self-perceived health. McDonald and Kennedy (2004) examined the origin of immigration. They found that immigrants from English-speaking countries and places that have a similar culture to Canada (e.g., New Zealand, Australia, US) tend to have worse health than immigrants from Europe and Asia at the time of landing. Lu and Ng (2019) took a closer look at immigration class, concluding that immigrants in the economic class, especially the principal applicant, show the largest advantage in healthy immigrant effect while refugees are only advantages in less severe chronic diseases. It's crucial to point out that the healthy immigrant effect exists even after adjustment for SES and health factors.

However, most, if not all, studies can agree that immigrant self-perceived health, chronic health, and mental health tend to converge with the native-born population as more time is spent inside Canada. More specifically, McDonald and Kennedy (2004) find that it takes about 20 to 25 years for immigrant health to converge with native-born Canadians, and the rate of decline is

larger for immigrants from non-English speaking countries like European and Asian immigrants than immigrants from English speaking countries since non-English speaking country immigrants showed more health advantages at the time of landing. Newbold and Danforth (2003), despite having a contradictory finding in self-perceived health where immigrants do worse than native-borns, they found that immigrants report less chronic illness, but that advantage erodes over time. Beiser (2003), in a literature review article, finds that for certain conditions, immigrant health not only converges to native-born Canadians, but they can overshoot and do worse than native-born Canadians. For example, they cited Sheth and colleagues (1999) saying that South Asians are five times more likely to have type 2 diabetes than native-born Canadians in the long term.

In general, researchers are split on the reason for this immigrant health convergence effect. Newbold and Danforth (2003), similar to this study, turn to various measures of social determinants of health, stating that immigrants with lower education and lower-income report lower health status than native-born counterparts who also have lower education and income. They also found that immigrants in the high-income category also fare slightly worse than the native-born population. Therefore, income gradients of health exist in the immigrant group. In addition, they found that immigrants who engage in work do better than those who are not working. Beiser (2003) seems to agree that poverty and unemployment are two factors that are universal to health disadvantages and states that immigrants are more likely to find themselves in that position due to resettlement and integration. They cited Sheth and colleagues (1999), contending that it takes about ten years for immigrants to establish the financial aspect of their lives. During that time, additional stress can contribute to the deterioration of health.

The study of immigrant health in the US tends to focus on acculturation and, more recently, structural frameworks such as access to healthcare, especially for the undocumented immigrants (Castaũeda et al., 2015). Like immigrants in Canada, the healthy immigrant effect is observed in the US, also known as the "immigrant health paradox." The immigrant health paradox exists in two ways in the US. Firstly, immigrants have better health than their native-born counterparts. Singh and Siahpush (2002) found that Black, Hispanic, Asian, and Pacific Islander immigrants with similar socioeconomic status and demographic backgrounds have better health than native-born white Americans. Another study by Singh and Miller (2004) later found that only foreign-born black immigrants experience better life expectancy than native-born blacks. Chinese, Japanese, and Filipino immigrants have lower life expectancy than their native-born counterparts. Other studies use the immigrant health paradox to express the lack of an SES health gradient among immigrants, as seen in Gavin and colleagues' (2010) study on depressive disorder and deCastro and colleagues' (2010) study on Asian immigrants. In looking for explanations for the lack of SES health gradient among immigrants, John and colleagues (2012) contend that the health paradox could be due to the context of immigration where higher socioeconomic immigrants may find it more difficult than lower socioeconomic immigrants to adjust to the destination society. As we have seen earlier from Newbold and Danforth (2003), immigrants have lower self-perceived health standards, which can lead to an over-optimistic estimation of immigrant health when using subjective measures.

Studies looked for explanations in risk factors turned to the smoking rate. Blue and Fenelon (2011) and Kuerban (2016) found evidence that smoking explains a great deal of the health differentials between immigrants and native-born. Blue and Fenelon (2011) contend that smoking explains more than 50% of men's and more than 70% of women's health differences

between immigrants and native-born. Kuerban (2016) found that the smoking rate is much lower among Asian immigrants than among native-born Asians, indicating that smoking can explain some health differences between immigrants and native-born. Other studies, however, are not content with the healthy immigrant effect, most likely because the immigrant health diminishing effect is strong the longer one lives in the US (Blue and Fenelon 2011, Singh and Siahpush 2002, Singh and Miller 2004, Kuerban 2016, Kandula et al. 2004). Therefore, many turned to the study of healthcare access and policy framework.

It is well documented that Mexican immigrants use healthcare less than their native-born counterparts, regardless of legal status. In addition, studies also show that undocumented Mexican and Latino immigrants visit doctors less compared to US-born counterparts (Ortega et al. 2007), while others document that undocumented Mexican immigrants have less access to doctor visits and care even when compared to their documented counterparts (Bustamante et al. 2010). Undocumented immigrants are also less likely to report the lack of access to healthcare due to their lack of legal status (Ortega et al. 2007). In a recent study, Dondero and Altman (2020) found that states with restrictive immigrant health policies and even non-health-related immigrant policies see less healthcare use among immigrants. Siddiqi and colleagues (2009) stress the importance of health insurance for healthcare access and health outcomes. They found that insurance access explains a large portion of the unmet health needs between immigrants and native-born in the US, as well as the difference between immigrants in the US and Canada.

Research Questions

This study marks an effort in exploring three sets of comparisons. Firstly, the study compares the US and Canada's overall populations on how SES shapes people's health outcomes.

Since the two countries have similar labor welfare state policies but drastically different healthcare welfare state policies, the study looks to answer the questions:

> Q1: In what ways do the effects of social determinants of health converge or differ for the health of Canadians and Americans?
>
> Q2: To what degree does the theory of the fundamental cause of disease hold in both contexts, and to what degrees does it hold?

In addition, a comparison is made between SES's association with perceived health between immigrants versus non-immigrants within Canada and the US to answer the question:

> Q3: How does SES shape immigrant and native-born population's health within Canada and the US?

Then, I compare the association between SES and perceived health within the immigrant group and non-immigrant group separately between Canada and the US to answer the question:

> Q4: How does the association between SES and health compare for immigrants and native-born populations in Canada and the US.

The Q3 comparison should elicit how social determinants of health associate with immigrants and non-immigrants differently in a single society, while the Q4 comparison should show us how immigrants and non-immigrants in Canada compare to their counterparts in the US regarding the effect of social determinants of health.

The immigrant and non-immigrant groups will be compared, and therefore, immigrant status is used as an interaction term on all other independent variables within the model instead of being treated as an independent variable like most studies mentioned earlier do. Therefore, the question is no longer about how immigrant status is associated with self-perceived health, but how the association between socioeconomic status and self-perceived health manifests

differently for the immigrant and non-immigrant groups. The latter will allow me to explore whether the fundamental cause of health disparities exists among immigrant and native-born groups. If the relationship still exists, how does that relationship look for the immigrants versus non-immigrants? Then, a comparison is made between Canada and the US regarding the relationship between socioeconomic status and health outcomes and how they are similar or different for immigrant and non-immigrant groups.

Research Strategy

This study uses the Canadian Community Health Survey (CCHS) 2017/2018 cross-sectional dataset for the Canadian samples and the National Health Interview Survey (NHIS) 2018 cross-sectional dataset for the United States samples. The study uses these two datasets for a couple of reasons. Firstly, the two surveys are designed for research on health, which provides comparable health measures. Secondly, the two datasets offer information on immigrants and the native-born population, which is one of the main research agendas in this study.

CCHS samples noninstitutionalized populations in all provinces besides people living on Indian Reserves and Crown Lands. The exclusion of the institutionalized population includes those in health institutions, prisons, and full-time military personnel. Similarly, NHIS also samples noninstitutionalized people living in 50 states and the District of Columbia. For NHIS, students living in the dormitory are included in the household they live in permanently. CCHS conducted 75% of the 2018 interviews in-person and 25% by phone, while NHIS conducted face-to-face interviews only. CCHS targets the population aged 12 and over, while NHIS does not have a specified target age. NHIS interviews sample adults (18 and over) themselves unless

they cannot do so due to mental and physical disability. Sample youth's (17 or below) information is collected from parents or an adult responsible for the health of the sampled youth.

Measures

Dependent variable: Perceived health. The dependent variable is perceived health. In the CCHS, perceived health was coded from poor (coded 0) to excellent (coded 4). In dichotomizing the variable for logistic regression, poor and fair are categorized into poor (coded 0), and good, very good, and excellent are categorized as good (coded 1). NHIS has the same categories as CCHS, albeit Excellent was originally coded 1 and poor was coded 5. Recoding of the NHIS was carried out, so that poor is coded 0, and good is coded 1 for consistency. Perceived health was previously used by Olafsdottir (2007) to study the welfare state and health. The World Health Organization also recognized it as suitable for comparative research (de Bruin, Picavet, and Nossikov 1996 cited by Olafsdottir 2007).

Independent variables: Education. Education is measured somewhat differently in the two surveys. In CCHS, education is categorized into three categories: less than secondary school graduation, secondary school graduation but no post-secondary education, post-secondary certificate or university degree. Due to the generic categories in CCHS, NHIS was recoded to match the three categories in the Canadian survey for consistency. The final categories for both datasets are: less than high school graduation (coded 1), high school graduation (coded 2), and college education or associate degree (coded 3).

Employment in the past 12 months: Employment status is a dummy variable that measures whether the person worked (coded 2) in the past 12 months or past year or not (coded 1). The questions are worded slightly differently in the two surveys. In CCHS, the question asks the respondent whether they worked at a job or a business anytime in the past 12 months

regardless of pay, while in NHIS, the question asked about working for pay in the past year. It is possible that someone worked without pay and is unable to reflect their work through the variable chosen in the NHIS dataset.

Household income: Household income in both CCHS and NHIS both came in five categories. Even though they do not line up exactly, they allow meaningful comparisons between the two countries especially when comparing the poorest to the richest category. It's important to note that the Canadian categories are, in general, 10 to 20 thousand dollars less than the US categories. This could result in more people clustered in the top income categories for Canada. In addition, two limitations are introduced with this variable. Firstly, the household income cannot be adjusted for consumer buying power due to the categorical nature. Also, the number of household members is accounted for separately as a control variable. Secondly, the US household income is recorded in the family data file, which means the number of missing data is exaggerated once household incomes are joined and assigned to individuals (11.8% missing for households 12.6% missing for individuals). However, out of all the missing household income, about 81% of the missing data comes from the native-born population. Given that the native-born population represents about 85% of the sample, the missing data should not disproportionately affect immigrants and non-immigrants[2].

Control variables: Control variables that are included in all of the models presented include age, sex, race, and family size. Age appears as categories in CCHS and is treated as a factor, while age is a continuous variable in NHIS. Therefore, age in NHIS is recoded to reflect the categories in CCHS. Race variable for the CCHS is suboptimal because they only included three categories in the data file (white, non-white, aboriginal), despite the survey questionnaire

[2] Immigrant status is defined as someone who is not born in the US or Canada. It is irrespective of citizenship status.

having many racial and ethnical categories. Thus, NHIS was recoded to match the CCHS category. Eventually, race is dichonomized into white and non-white. Lastly, family size is controlled by both countries. The US data was recoded to match the Canadian dataset with one to four categories reflecting the exact number of people in the household and the fifth category representing family size of five and over.

Results

Table 1 is the Descriptive statistics for the variables used in this study. Two things are worth noting. Firstly, Canadian immigrants show a clear advantage in education compared to the native-born population and marginally better health than the native-born population, which reflects the points system for Canadian immigration working in selecting immigrants who are better educated, and the stringent immigrant health screening, screening for immigrants with conditions that may create a huge burden on the healthcare system (Lu et al. 2017, Antecol et al. 2003). Also, while Canadian immigrants' income distribution is similar to that of the native-born population, the US immigrants show a significant income deficit compared to their native-born counterparts. In fact, the US exhibits a more polarized income distribution, with the lowest and highest income category possessing the highest share of people. This bimodal distribution on the lowest and highest end also exists in the immigrant group. For the immigrant group, almost one-third of the people fall into the lowest income bracket.

Table 2 reports income's association with self-perceived health for overall population, immigrants, and native-born population for both Canada and the US. The dependent variable for all models is self-perceived health, which is dichotomized into poor (0) and good (1). As we can see from table 2, the average probability of having good health increases as income increases in

both countries compared to the reference group, which is the lowest income group in both countries across all three models. Across all three models for the overall population, Canada and the US shows similar marginal effects for the highest income group, and therefore, similar probability of having good health. Another interpretation is that Canada and the US have similar health disparities across income groups, also known as income health gradient. This directly tests the overarching research question, showing strong evidence that income affects the Canadian and American overall population in similar ways.

However, when we transition our attention to the immigrant and native-born population, we see an interesting pattern (highlighted in gray). In model 1, the top income group for the Canadian immigrant shows a slightly less increase in the probability of having good health over the lowest income group than the increase experienced by the highest income group in the US immigrant despite the native population in both countries showing similar probability for good health. This pattern persists through the three models. It's also important to note that immigrants in both countries show smaller income health gradients than their native born counterparts. This finding suggests two things. Firstly, we observe smaller income health gradients in Canadian immigrants than the US immigrants. Secondly, immigrants in both countries experience smaller income health gradients than their native-born counterparts. This suggests that immigrants not only experience income health gradient differently from their native-born counterparts, but also experience income health gradient differently in the two countries.

Table 1. Descriptive Statistics (%table)

	Canada				US		
	Total (N=91,541)	**Canadian Imm (N=15,187)**	**Canadian Native-born (N=76,354)**		**Total (N=48,372)**	**US Imm (N=8,479)**	**US Native-born (N=39,893)**
Health							
Good	87.3	89.4	86.9		87.2	86.9	87.2
Sex							
Female	53.2	53.2	53.2		52.1	53.3	51.9
Race							
Non-white	19.1	59.5	11.0		19.7	39.3	15.5
Age							
Younger than 18	4.3	2.6	4.7		1.6	0.6	1.8
18-39	31.2	34.3	30.6		35.1	35.7	35.0
40-69	55.8	53.4	56.2		50.2	53.8	49.7
Older than 70	8.7	9.6	8.5		12.9	9.9	13.5
Family Size							
1	26.7	22.8	27.5		17.7	12.4	18.8
2	36.3	31.6	37.2		34.7	26.2	36.5
3	14.5	16.5	14.1		18.0	18.7	17.8
4	14.3	17.1	13.8		15.8	20.2	14.8
5 and more	8.1	12.0	7.4		13.9	22.5	12.1
Immigration Status							
Native-born	83.4				82.5		
Household Income							
No income or less than $20,000	8.6	9.6	8.4	No income or less than $34,999	25.0	30.3	23.9
$20,000 to $39,999	14.5	15.6	14.3	$35,000 to $49,999	10.8	12.2	10.6
$40,000 to $59,999	15.3	15.8	15.2	$50,000 to $74,999	16.8	16.5	16.9
$60,000 to $79,999	13.6	13.7	13.6	$75,000 to $99,999	14.0	11.4	14.6
$80,000 or more	48.0	45.4	48.5	$100,000 or more	33.2	29.5	34.0
Education							
Less than high school graduation	15.6	9.9	16.7		11.3	23.6	8.7
High school graduation	23.8	19.7	24.6		25.1	21.3	26.0
College education	60.7	70.4	58.7		63.5	55.2	65.3
Employment in the Past 12 months							
Yes	69.9	69.8	70.0		67.2	67.6	67.1

Table 3 reports education's association with self-perceived health for overall population and immigrants for both countries. The only notable finding is that immigrants in both countries experience less education health gradients than their native-born counterparts and Canadian immigrants experience less income health gradients than American immigrants. These differences, both within countries and between countries, are eliminated after controlling for household income (model 2), household income and employment status (model 3).

Table 4 reports employment status' association with self-perceived health for overall population and immigrants for both countries. The result shows less employment status health gradient in Canada for both immigrants and native-borns. Overall, immigrants in both countries experience less employment status health gradient than their native-born counterparts.

Table 2. Logistic Regression of Self-Perceived Health on Household Income for Overall Canadians, Overall Americans, and Immigrants and Native-born for Both Countries Controlling for Race, Gender, Age, and Household Size (Reported numbers are Marginal Effect).

	Canada					US			
	Total (N=91,541)	**Immigrant (N=15,187)**	**Native-Born (N=76,354)**	**Difference (Immigrant - Native Born)**		**Total (N=48,372)**	**Immigrant (N=8,479)**	**Native-Born (N=39,893)**	**Difference (Immigrant - Native Born)**
Model 1.									
Household Income					*Household Income*				
No income or less than $20,000	Reference	Reference	Reference		No income or less than $34,999	Reference	Reference	Reference	
$20,000 to $39,999	0.108	0.039	0.125	-0.086***	$35,000 to $49,999	0.100	0.097	0.102	-0.005
$40,000 to $59,999	0.162	0.075	0.184	-0.109***	$50,000 to $74,999	0.148	0.102	0.161	-0.059***
$60,000 to $79,999	0.193	0.093	0.219	-0.126***	$75,000 to $99,999	0.186	0.144	0.200	-0.056*
$80,000 or more	0.222	0.111	0.251	-0.140***	$100,000 or more	0.220	0.178	0.236	-0.058***
Model 2. Controlling for Employment Status									
No income or less than $20,000	Reference	Reference	Reference		No income or less than $34,999	Reference	Reference	Reference	
$20,000 to $39,999	0.063	0.014	0.076	-0.062***	$35,000 to $49,999	0.065	0.070	0.063	0.007
$40,000 to $59,999	0.103	0.040	0.119	-0.079***	$50,000 to $74,999	0.103	0.071	0.111	-0.040*
$60,000 to $79,999	0.128	0.054	0.147	-0.093***	$75,000 to $99,999	0.133	0.111	0.14	-0.029
$80,000 or more	0.150	0.068	0.172	-0.104***	$100,000 or more	0.166	0.141	0.174	-0.033.
Model 3. Controlling for Education and Employment Status									
No income or less than $20,000	Reference	Reference	Reference		No income or less than $34,999	Reference	Reference	Reference	
$20,000 to $39,999	0.055	0.014	0.066	-0.052***	$35,000 to $49,999	0.049	0.054	0.048	0.006
$40,000 to $59,999	0.087	0.036	0.101	-0.065***	$50,000 to $74,999	0.081	0.045	0.091	-0.046*
$60,000 to $79,999	0.108	0.049	0.125	-0.076***	$75,000 to $99,999	0.109	0.082	0.118	-0.036
$80,000 or more	0.127	0.060	0.146	-0.086***	$100,000 or more	0.140	0.105	0.152	-0.047*

Table 3. Logistic Regression of Self-Perceived Health on Education for Overall Canadians, Overall Americans, and Immigrants and Native-born for Both Countries Controlling for Race, Gender, Age, and Household Size (Reported numbers are Marginal Effect).

	Canada				US			
	Total (N=91,541)	**Immigrant (N=15,187)**	**Native-Born (N=76,354)**	**Difference (Immigrant - Native Born)**	**Total (N=48,372)**	**Immigrant (N=8,479)**	**Native-Born (N=39,893)**	**Difference (Immigrant - Native Born)**
Model 1								
Education								
Less than high school graduation	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
High school graduation	0.088	0.073	0.088	-0.015	0.109	0.089	0.122	-0.033
College education	0.133	0.105	0.135	-0.030	0.177	0.151	0.191	-0.040
Model 2 Controlling for household income								
Education								
Less than high school graduation	Reference	Reference	Reference	Reference	Reference	Reference	Reference	
High school graduation	0.054	0.059	0.049	0.010	0.532	0.053	0.065	-0.012
College education	0.087	0.083	0.082	0.001	0.083	0.080	0.094	-0.014
Model 3 Controlling for household income and employment status								
Education								
Less than high school graduation	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
High school graduation	0.043	0.048	0.039	0.009	0.045	0.048	0.052	-0.004
College education	0.071	0.065	0.066	-0.001	0.070	0.073	0.076	-0.003

Table 4. Logistic Regression of Self-Perceived Health on Employment in the Past 12 Months for Overall Canadians, Overall Americans, and Immigrants and Native-born for Both Countries Controlling for Race, Gender, Age, and Household Size (Reported numbers are Marginal Effect).

	Canada				US			
	Total (N=91,541)	**Immigrant (N=15,187)**	**Native-Born (N=76,354)**	**Difference (Immigrant - Native Born)**	**Total (N=48,372)**	**Immigrant (N=8,479)**	**Native-Born (N=39,893)**	**Difference (Immigrant - Native Born)**
				Model 1				
Employment in the Past 12 months								
No	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Yes	0.146	0.102	0.159	-0.057***	0.186	0.165	0.194	-0.029**
				Model 2 Controlling for household income				
Employment in the Past 12 months								
No	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Yes	0.109	0.087	0.116	-0.029	0.134	0.114	0.141	-0.027.
				Model 3 Controlling for household income and education				
Employment in the Past 12 months								
No	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Yes	0.101	0.082	0.108	-0.026	0.131	0.106	0.137	-0.031.

Discussion

This study uses nationally representative data from the US and Canada to examine the relationship between social determinants of health and self-perceived health in two different welfare states. The study compares social determinants of health's association with self-perceived health between the two countries given a similar liberal labor market welfare state but different healthcare welfare state approaches. The answer to this question is twofold. Firstly, social determinants of health are strongly associated with perceived health in both countries. One may suspect that a country with universal healthcare should have a minimum association between education, employment status, and health because the system is equalizing in nature, and healthcare is free for everyone. In Canada, healthcare is also not attached to one's employment compensation, as is often the case in the US (Case and Deaton 2020), making one suspect that employment status is less important to health in Canada. However, studies have shown that the relationship between education, employment status, and health is more than just allowing access to healthcare when health problems arise; they often relate to preventive measures. Mirowsky and Ross (2015) state that education entails reading, writing, and critical thinking that can never be taken away, which subsequently affects one's approach to the choice of lifestyle. Additionally, they contend that education arms people with perseverance when facing difficulties and grants people a heightened sense of personal control. In the context of universal healthcare, Deaton (2002) argues that people with higher education can better utilize the system, making a seemingly equal system unequal in its outcomes. When it comes to employment (or unemployment), the health deficit can come directly from the income loss, health insurance in the context of the US, but also indirectly from the psychological effects like the stigma associated with idleness, reduced social interactions, and the loss in the sense of

self-worth (Bambra and Beckfield 2012). In addition, Lasser and colleagues (2006) and Sanmartin and colleagues (2006) show that barriers to care are different in the US than in Canada. While cost is the barrier to entry to the US healthcare system, the long wait time is the barrier for Canadians. This can potentially reduce health advantages in the higher household income group in Canada because money may not be able to buy better healthcare or cut the line in a country with universal healthcare (Olafsdottir 2007).

Secondly, suppose we switch our attention away from statistical significance to focus on the marginal effect and the magnitude of the differences between groups. We observe that Canada has smaller education and employment health gradients in Tables 3 and 4. Though the difference is minuscule, it is worth attention for future research to understand the difference in the meaning of being employed and being highly educated in the two societies. By examining the magnitude of the difference in inequality, Bambra and Eikemo's (2009) study on the association between unemployment and health in different welfare states found that people living in countries with more generous welfare states experience less employment health gradient than people living in less generous welfare states. Interestingly, their study used a welfare state typology that largely reflects labor market decommodification. This study sees differences in employment health gradients even in countries with similar labor market welfare states but different healthcare welfare states. This indicates that despite scholars arguing that universal healthcare does not alleviate health inequalities if one lives in financially strained situations (Olafsdottir 2007 cited Davey Smith and colleagues 1990, Townsend and colleagues 1990), universal healthcare in Canada seems to make a difference, though small difference, to reduce unemployment health gradient. Additionally, Bambra and Beckfield (2012) cited Diderichsen (2002), stating that the use of welfare in less generous welfare states can be associated with more

stigma than welfare entitled countries. In the case of Canada, the use of welfare may be associated with less stigma, which alleviates the psychological stress related to welfare usage. Future studies can pursue this path as the study of values is out of the purview of this study.

This study contrasts Olafsdottir's (2007) study, of which she concludes that relative affluence is significantly associated with self-assessed health for Americans but not for Icelanders. However, it is important to remember that Iceland is categorized as a social-democratic welfare state regime for both labor market and healthcare policy areas. Given that Canada is liberal (less generous) in labor market policies but social-democratic (generous) in healthcare policies, this comparison suggests that the universal healthcare system may not be as effective in reducing health inequalities related to income as generous labor market welfare regimes. This goes back to our discussion earlier that one's health outcomes are not simply related to access to care but often related to preventative measures. Those with more income might gain access to better living environments, cleaner food and water, and work environments (Bambra and Beckfield 2012).

This result has implications for the theory of the fundamental cause of disease. The statistical significance and the marginal effect support the theory of the fundamental cause of disease for both the US and Canada. This finding suggests that universal healthcare may not be as equalizing as expected. However, even though this result is unexpected, it is not necessarily unique. Eikemo et al. (2008) study on income health inequalities finds that the Scandinavian welfare regime with both a social-democratic (more generous) labor market and healthcare policies shows larger income health inequalities than the Bismarckian welfare state regime (less generous). In fact, the unexpected finding of the Scandinavian welfare state regime spans multiple areas, including education-related health inequality (Eikemo et al. 2008). Bambra

(2011) famously calls these findings the Scandinavian welfare puzzle. She attributes the puzzle's existence to culture and behavior, materialist, psychosocial, and life course explanations. For example, socioeconomic inequality in smoking is higher in multiple Scandinavian welfare countries (Mackenbach et al. 2008, Cavelaars et al. 2000). In the North American context, studies by Dinca-Panaitescu and colleagues (2011, 2012) show that the relationship between low income and Type II diabetes in Canada is significant even after controlling for age, sex, and health behaviors. In a literature review, Petrovic and colleagues (2018) found that health behaviors tend to contribute more to socioeconomic health differences in North America and Northern Europe (aligns with the Scandinavian puzzle) than in Central/Southern Europe. They also suggest that the change in health behaviors that used to damage higher SES people's health, like smoking and high energy diets, now affect low SES groups. Miech's (2008) study on cocaine use in the 80s and 90s in the US also suggests the remnant effect where the high SES tend to opt out of unhealthy behaviors, leaving the low SES people to continue the risk behaviors. Therefore, I suggest future research on the welfare state and health should account for socioeconomic inequality in health behaviors. In general, more studies should be done on socioeconomic inequality in health behaviors in Canada because it may contribute tremendously to the understanding of health inequalities/disparities.

On the immigrant population front, results show notably smaller income health gradients for Canadian immigrants than US immigrants and smaller income health gradients than their native-born counterparts. In fact, US immigrants also experience smaller income health gradients than the native-born population. It's important to reiterate the difference in dollar amount in the income categories and currency difference between the two countries. A measure of income adjusted to buying power may be a better indicator, though not possible for this study due to

incomes being categories. However, we can still learn something from the marginal effect for the top income group compared to the lowest income group. The takeaway is that immigrants' health is less sensitive to change in income than native-borns, and Canadian immigrants' health is not as sensitive to the change in income as the US immigrants.

There are multiple ways we can unpack these findings. Firstly, our sample reflects the large population pattern that Canadian immigrants have slightly better health, much more household income, and much higher educational attainment than the US immigrants (Antecol et al. 2003, Lu et al. 2017). This is most likely due to the Canadian points system as well as the more stringent health screening that works in harmony, selecting educated and healthy immigrants (Antecol et al. 2003, Lu et al. 2017). Therefore, we cannot rule out the possibility that Canadian immigrants are already better established financially and educationally in their sending country before immigrating to Canada, which could be associated with relatively good health at the time of immigration (Healthy immigrant effect). As we know from Sheth and colleagues (1999) that it can take up to ten years for immigrants to establish themselves in Canada, which elicits the possibility that lower income immigrants in Canada are enjoying their health advantage established before immigration. As we know, most studies on immigrant health in Canada observe the deterioration of immigrant health advantages and the eventual convergence with native-born people's health (McDonald and Kennedy 2004, Newbold and Danforth 2003, Beiser 2003). This suggests that the healthy immigrant effect in conjunction with the universal healthcare system in Canada might be one of the reasons why immigrant household income is not as strongly associated with immigrant health compared to the US counterparts in this study, given that the universal healthcare can be significant at alleviating the cost burden for new immigrants. Due to the coarse nature of the Canadian data, the study is unable to include

years since immigration as a control or variable of interest in a meaningful fashion, despite the fact that it may affect the outcome of the association between household income and health. An interesting future study would be income's association with health across the number of years since immigration. I suspect we might see an increasing association between income and health as more years are spent in Canada.

Secondly, from the US perspective, even though the healthy immigrant effect is also observed, albeit it also diminishes with time (Singh and Siahpush 2002, Blue and Fenelon 2011 Singh and Miller 2004, Kuerban 2016, Kandula et al. 2004), people are burdened with the high cost of healthcare soon after immigration. In addition, studies show that the largest immigrant group to the US, Mexican immigrants, use less healthcare than native-born counterparts, regardless of legal status, while the undocumented Mexican and Latino immigrants use healthcare even less than their legal counterparts due to fear of deportation (Ortega et al. 2007, Bustamante et al. 2010). The US-specific immigrant demographic profile and the larger number of undocumented immigrants may have something to do with income's association with health, especially given that undocumented immigrants are often marginalized in the US society in every single way, from getting a job to access to care (van Doorn and Vijay 2021). Future studies can test this hypothesis by comparing the health convergence effect among immigrants between Canada and US to see if the immigrant health advantage in the US diminishes quicker due to the healthcare cost burden and the fact that US immigrants are possibly less established than the Canadian immigrants financially and educationally.

Lastly, immigrants experience a smaller income health gradient across two countries than their native-born counterparts. In this case, I emphasize the importance of socioeconomic inequality in risk behaviors like smoking, which can also increase the association between

income and health of the native-born population. In fact, Blue and Fenelon (2011) show that smoking explains about 50% of men's and 70% of women's health differences between immigrants and native-born, with immigrants being the advantageous group. Even when race and ethnicity are controlled, Kuerban (2016) found evidence that native-born Asians tend to smoke more than Asian immigrants. These studies point to a trend that future research should expand the study on risk behaviors to multiple different ones and observe how they differ between immigrants and native-born.

Conclusion

The study uses nationally representative data from Canada and the US to answer the overarching question: does the theory of the fundamental cause of disease hold in Canada, a country with a similar liberal labor market welfare state to the US but universal healthcare. The answer to this question is that the fundamental cause of disease does hold in Canada. When looking at the overall population, Canada, just like the US, shows statistically significant relationships between education, employment status, household income, and self-perceived health. After computing for average marginal effect, Canada and the US show a comparable health income gradient. However, when examining the immigrant population, the health income gradient is not as dramatic in Canada as it is in the US, suggesting immigrant health in Canada is less sensitive to income. Both Canada's and the US immigrants' health are less sensitive to income than the native-born population, suggesting that immigrants in both countries experience income health inequality differently than their respective native-born populations. The study suggests that the comparison between the US and Canada can benefit from studies of socioeconomic inequality in risk behaviors like smoking and many other risk behaviors. Studies

in the future can also compare the health convergence effect between Canada and the US to understand both the role universal healthcare in Canada might have played in this effect, but also the association between income and health over time.

Reference List

Antecol, Heather, Deborah A. Cobb-Clark, and Stephen J. Trejo. 2003. "Immigration Policy and the Skills of Immigrants to Australia, Canada, and the United States." *Journal of Human Resource* 38(1):193-218.

Beckfield, Jason. 2004. "Does Income Inequality Harm Health? New Cross-National Evidence." Journal of Health and Social Behavior 45(3):231–48.

Beckfield, Jason, Sigrun Olafsdottir, and Elyas Bakhtiari. 2013. "Health Inequalities in Global Context." American Behavioral Scientist 57(8):1014–39.

Bambra, C. 2007. "Going beyond The Three Worlds of Welfare Capitalism: Regime Theory and Public Health Research." Journal of Epidemiology & Community Health 61(12):1098–1102.

Bambra, Clare. 2005. "Worlds of Welfare and the Health Care Discrepancy." Social Policy and Society 4(1):31–41.

Bambra, Clare. 2006. "Research Note: Decommodification and the Worlds of Welfare Revisited." Journal of European Social Policy 16(1):73–80.

Bambra, Clare., and T. A. Eikemo. 2008. "Welfare State Regimes, Unemployment and Health: A Comparative Study of the Relationship between Unemployment and Self-Reported Health in 23 European Countries." *Journal of Epidemiology & Community Health* 63(2):92–98. doi: 10.1136/jech.2008.077354.

Bambra, Clare., M. Gibson, A. Sowden, K. Wright, M. Whitehead, and M. Petticrew. 2010. "Tackling the Wider Social Determinants of Health and Health Inequalities: Evidence from Systematic Reviews." *Journal of Epidemiology & Community Health* 64(4):284–91. doi: 10.1136/jech.2008.082743.

Bambra, Clare. 2011. "Health Inequalities and Welfare State Regimes: Theoretical Insights on a Public Health 'Puzzle.'" *Journal of Epidemiology & Community Health* 65(9):740–45. doi: 10.1136/jech.2011.136333.

Bambra, Clare and Jason Beckfiled. 2012. "Institutional Arrangements as Candidate Explanations for the US Mortality Disadvantage." *Prepared for the NAS/IOM panel on Understanding International Health Differences in High Income Countries.*

Bruin, A. de, H. S. J. Picavet, and A. Nossikov, eds. 1996. *Health Interview Surveys: Towards International Harmonization of Methods and Instruments*. Copenhagen: World Health Organization, Regional Office for Europe.

Beiser, Morton. 2005. "The Health of Immigrants and Refugees in Canada." *Canadian Journal of Public Health*96(S2):S30–44. doi: 10.1007/BF03403701.

Berkman, L. F., & Breslow, L. 1983. *Health and ways of living: The Alameda County study*. Oxford University Press.

Blue, Laura, and Andrew Fenelon. 2011. "Explaining Low Mortality among US Immigrants Relative to Native-Born Americans: The Role of Smoking." *International Journal of Epidemiology* 40(3):786–93. doi: 10.1093/ije/dyr011.

Bustamante, Arturo Vargas, Jie Chen, Ryan M. McKenna, and Alexander N. Ortega. 2019. "Health Care Access and Utilization Among U.S. Immigrants Before and After the Affordable Care Act." *Journal of Immigrant and Minority Health* 21(2):211–18. doi: 10.1007/s10903-018-0741-6.

Cavelaars, A.E., Kunst, A.E., Geurts, J.J., Crialesi, R., Grotvedt, L., Helmert, U., Mackenbach, J.P., 2000. "Educational differences in smoking: International comparison." *BMJ.* 320 (7242), 1102-1107.

Case, Anne, and Angus Deaton. 2021. “How American Healthcare Is Undermining Lives.” 22.

Castañeda, Heide, Seth M. Holmes, Daniel S. Madrigal, Maria-Elena DeTrinidad Young, Naomi Beyeler, and James Quesada. 2015. “Immigration as a Social Determinant of Health.” *Annual Review of Public Health* 36(1):375–92. doi: 10.1146/annurev-publhealth-032013-182419.

Coburn, David. 2004. “Beyond the Income Inequality Hypothesis: Class, Neo-Liberalism, and Health Inequalities.” *Social Science & Medicine* 58(1):41–56. doi: 10.1016/S0277-9536(03)00159-X.

Dahlgren, Göran, and Margaret Whitehead. 1991. “Policies and Strategies to Promote Social Equity in Health.” Stockholm: Institute for Future Studies.

Davey Smith, G., Mel Bartley, and David. Blane. 1990. “The Black Report on Socioeconomic Inequalities in Health 10 Years On.” *BMJ* 301(6748):373–77. doi: 10.1136/bmj.301.6748.373.

Deaton, Angus. 2002. “Policy Implications Of The Gradient Of Health And Wealth.” *Health Affairs* 21(2):13–30. doi: 10.1377/hlthaff.21.2.13.

de Castro, A. B., Gilbert C. Gee, and David T. Takeuchi. 2010. “Examining Alternative Measures of Social Disadvantage Among Asian Americans: The Relevance of Economic Opportunity, Subjective Social Status, and Financial Strain for Health.” *Journal of Immigrant and Minority Health* 12(5):659–71. doi: 10.1007/s10903-009-9258-3.

Dondero, Molly, and Claire E. Altman. 2020. “Immigrant Policies as Health Policies: State Immigrant Policy Climates and Health Provider Visits among U.S. Immigrants.” *SSM - Population Health* 10:100559. doi: 10.1016/j.ssmph.2020.100559.

de Bruin, A., H. S. J. Picavet, and Anatoly Nossikov. 1996. *Health Interview Surveys: Towards International Harmonization of Methods and Instruments*. Copenhagen: World Health Organization, Regional Office for Europe.

Diderichsen, Finn. 2002. "Income maintenance policies: determining their potential impact on socioeconomic inequalities in health." *In Reducing inequalities in health: a European Perspective,* pp75-88. London: Routledge.

Dinca-Panaitescu, Mihaela, Serban Dinca-Panaitescu, Dennis Raphael, Toba Bryant, Beryl Pilkington, and Isolde Daiski. 2012. "The Dynamics of the Relationship between Diabetes Incidence and Low Income: Longitudinal Results from Canada's National Population Health Survey." *Maturitas* 72(3):229–35. doi: 10.1016/j.maturitas.2012.03.017.

Dinca-Panaitescu, Serban, Mihaela Dinca-Panaitescu, Toba Bryant, Isolde Daiski, Beryl Pilkington, and Dennis Raphael. 2011. "Diabetes Prevalence and Income: Results of the Canadian Community Health Survey." *Health Policy* 99(2):116–23. doi: 10.1016/j.healthpol.2010.07.018.

Eikemo, Terje A., Martijn Huisman, Clare Bambra, and Anton E. Kunst. 2008. "Health Inequalities According to Educational Level in Different Welfare Regimes: A Comparison of 23 European Countries: Health Inequalities According to Educational Level." Sociology of Health & Illness 30(4):565–82.

Eikemo, Terje A., Clare. Bambra, K. Joyce, and Espen Dahl. 2008. "Welfare State Regimes and Income-Related Health Inequalities: A Comparison of 23 European Countries." *European Journal of Public Health* 18(6):593–99. doi: 10.1093/eurpub/ckn092.

Esterline, Cecilia and Jeanne Batalova. 2022. Frequently Requested Statistics on Immigrants and Immigration in the United States. Migration Information Source. Retrieved on April 14, 2022: (https://www.migrationpolicy.org/article/frequently-requested-statistics-immigrants-and-immigration-united-states).

Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism*. Cambridge, UK: Polity Press.

Gavin, A. R., E. Walton, D. H. Chae, M. Alegria, J. S. Jackson, and D. Takeuchi. 2010. "The Associations between Socio-Economic Status and Major Depressive Disorder among Blacks, Latinos, Asians and Non-Hispanic Whites: Findings from the Collaborative Psychiatric Epidemiology Studies." *Psychological Medicine* 40(1):51–61. doi: 10.1017/S0033291709006023.

Gushulak, B. D., K. Pottie, J. H. Roberts, S. Torres, M. DesMeules, and on behalf of the Canadian Collaboration for Immigrant and Refugee Health. 2011. "Migration and Health in Canada: Health in the Global Village." *Canadian Medical Association Journal* 183(12):E952–58. doi: 10.1503/cmaj.090287.

Granovetter, Mark. 1973. "The Strength of Weak Ties." American Journal of Sociology 78: 1360-80.

Humphries, Karin H., and Eddy van Doorslaer. 2000. "Income-Related Health Inequality in Canada." *Social Science & Medicine* 50(5):663–71. doi: 10.1016/S0277-9536(99)00319-6.

Hagan, Jacqueline Maria. 1998. “Social Networks, Gender, and Immigrant Incorporation: Resources and Constraints.” *American Sociological Review* 63(1):55. doi: 10.2307/2657477.

House, James S., Robert F. Schoeni, George A. Kaplan, and Harold Pollack. 2008. “The Health Effects of Social and Economic Policy: The Promise and Challenge for Research and Policy.” In R. F. Schoeni, J. S. House, G. A. Kaplan, & H. Pollack (Eds.), Making Americans healthier: Social and economic policy as health policy (pp. 3-26). New York: Russell Sage Foundation.

John, Dolly A., A. B. de Castro, Diane P. Martin, Bonnie Duran, and David T. Takeuchi. 2012. “Does an Immigrant Health Paradox Exist among Asian Americans? Associations of Nativity and Occupational Class with Self-Rated Health and Mental Disorders.” *Social Science & Medicine* 75(12):2085–98. doi: 10.1016/j.socscimed.2012.01.035.

Kasza, Gregory J. 2002. “The Illusion of Welfare’ Regimes.’” Journal of Social Policy 31(02).

Khan, Shamus. 2012. Privilege: The making of an adolescent elite at St. Paul’s School. Princeton University Press

Kandula, Namratha R., Margaret Kersey, and Nicole Lurie. 2004. “Assuring the Health of Immigrants: What the Leading Health Indicators Tell Us.” *Annual Review of Public Health* 25(1):357–76. doi: 10.1146/annurev.publhealth.25.101802.123107.

Kuerban, Aliya. 2016. “Healthy Migrant Effect on Smoking Behavior Among Asian Immigrants in the United States.” *Journal of Immigrant and Minority Health* 18(1):94–101. doi: 10.1007/s10903-014-0155-z.

Kimbro, Rachel Tolbert, Sharon Bzostek, Noreen Goldman, and Germán Rodríguez. 2008. "Race, Ethnicity, And The Education Gradient In Health." *Health Affairs* 27(2):361–72. doi: 10.1377/hlthaff.27.2.361.

Link, Bruce G., and Jo Phelan. 1995. "Social Conditions As Fundamental Causes of Disease." Journal of Health and Social Behavior 35:80.

Lasser, Karen E., David U. Himmelstein, and Steffie Woolhandler. 2006. "Access to Care, Health Status, and Health Disparities in the United States and Canada: Results of a Cross-National Population-Based Survey." *American Journal of Public Health* 96(7):1300–1307. doi: 10.2105/AJPH.2004.059402.

Leu, Janxin, Irene H. Yen, Stuart A. Gansky, Emily Walton, Nancy E. Adler, and David T. Takeuchi. 2008. "The Association between Subjective Social Status and Mental Health among Asian Immigrants: Investigating the Influence of Age at Immigration." *Social Science & Medicine* 66(5):1152–64. doi: 10.1016/j.socscimed.2007.11.028.

Lum, Terry Y., and Julianne P. Vanderaa. 2010. "Health Disparities Among Immigrant and Non-Immigrant Elders: The Association of Acculturation and Education." *Journal of Immigrant and Minority Health* 12(5):743–53. doi: 10.1007/s10903-008-9225-4.

Lu, Yao, Neeraj Kaushal, Nicole Denier, and Julia Shu-Huah Wang. 2017. "Health of Newly Arrived Immigrants in Canada and the United States: Differential Selection on Health." *Health & Place* 48:1–10. doi: 10.1016/j.healthplace.2017.08.011.

Lu, Chaohui, and Edward Ng. 2019. "Healthy Immigrant Effect by Immigrant Category in Canada." *Health Reports*Volume 30:Issue 4 April 2019 Pages 3-11. doi: 10.25318/82-003-X201900400001-ENG.

Lou, Yimin, and Roderic Beaujot. 2005. “What Happens to the ‘Healthy Immigrant Effect’: The Mental Health of Immigrants to Canada.” PSC Discussion Paper Series 19(5).

Mackenbach, Johan P., Albert-Jan R. Roskam, Maartje M. Schaap, and Gwenn Menvielle. 2008. “Socioeconomic Inequalities in Health in 22 European Countries.” N Engl j Med 14.

Miech, Richard. 2008. “The Formation of a Socioeconomic Health Disparity: The Case of Cocaine Use during the 1980s and 1990s.” *Journal of Health and Social Behavior* 49(3):352–66. doi: 10.1177/002214650804900308.

Mirowsky, John, and Catherine E. Ross. 2015. “Education, Health, and the Default American Lifestyle.” *Journal of Health and Social Behavior* 56(3):297–306. doi: 10.1177/0022146515594814.

McDonald, James Ted, and Steven Kennedy. 2004. “Insights into the ‘Healthy Immigrant Effect’: Health Status and Health Service Use of Immigrants to Canada.” *Social Science & Medicine* 59(8):1613–27. doi: 10.1016/j.socscimed.2004.02.004.

Newbold, K. Bruce, and John K. Filice. 2006. “Health Status of Older Immigrants to Canada.” *Canadian Journal on Aging / La Revue Canadienne Du Vieillissement* 25(3):305–19. doi: 10.1353/cja.2007.0009.

Ng, Edward, Russell Wilkins, François Gendron, and Jean-Marie Berthelot. 2005. “Dynamics of Immigrants’ Health: Evidence from Canada, 1994-95 to 2002-03. Summary Report.” *Canadian Studies in Population* 32(1):131. doi: 10.25336/P6FS4G.

Olafsdottir, Sigrun. 2007. “Fundamental Causes of Health Disparities: Stratification, the Welfare State, and Health in the United States and Iceland.” Journal of Health and Social Behavior 48(3):239–53.

Olafsdottir, Sigrun, and Jason Beckfield. 2011. “Health and the Social Rights of Citizenship: Integrating Welfare-State Theory and Medical Sociology.” Pp. 101–15 in *Handbook of the Sociology of Health, Illness, and Healing*, *Handbooks of Sociology and Social Research*, edited by B. A. Pescosolido, J. K. Martin, J. D. McLeod, and A. Rogers. New York, NY: Springer New York.

Ortega, Alexander N., Hai Fang, Victor H. Perez, John A. Rizzo, Olivia Carter-Pokras, Steven P. Wallace, and Lillian Gelberg. 2007. “Health Care Access, Use of Services, and Experiences Among Undocumented Mexicans and Other Latinos.” *Archives of Internal Medicine* 167(21):2354. doi: 10.1001/archinte.167.21.2354.

Phelan, Jo C., and Bruce G. Link. 2005. “Controlling Disease and Creating Disparities: A Fundamental Cause Perspective.” The Journals of Gerontology: Series B 60(Special_Issue_2):S27–33.

Phelan, Jo C., and Bruce G. Link. 2015. “Is Racism a Fundamental Cause of Inequalities in Health?” Annual Review of Sociology 41(1):311–30.

Petrovic, Dusan, Carlos de Mestral, Murielle Bochud, Mel Bartley, Mika Kivimäki, Paolo Vineis, Johan Mackenbach, and Silvia Stringhini. 2018. “The Contribution of Health Behaviors to Socioeconomic Inequalities in Health: A Systematic Review.” *Preventive Medicine* 113:15–31. doi: 10.1016/j.ypmed.2018.05.003.

Ross, Nancy, Michael Wolfson, James Dunn, Jean-Marie Berthelot, GeorgeKaplan, John Lynch. 2000. “Relation between income inequality and mortality in Canada and in the United States: cross sectional assessment using census data and vital statistics.” *BMJ* 320(7239):898–902. doi: 10.1136/bmj.320.7239.898.

Sanmartin, Claudia, Jean-Marie Berthelot, Edward Ng, Kellie Murphy, Debra L. Blackwell, Jane F. Gentleman, Michael E. Martinez, and Catherine M. Simile. 2006. "Comparing Health And Health Care Use In Canada And The United States." *Health Affairs* 25(4):1133–42. doi: 10.1377/hlthaff.25.4.1133.

Sánchez-Vaznaugh, E. V., I. Kawachi, S. V. Subramanian, B. N. Sanchez, and D. Acevedo-Garcia. 2009. "Do Socioeconomic Gradients in Body Mass Index Vary by Race/Ethnicity, Gender, and Birthplace?" *American Journal of Epidemiology* 169(9):1102–12. doi: 10.1093/aje/kwp027.

Silvers, J. B. 2013. "The Affordable Care Act: Objectives and Likely Results in an Imperfect World." *Ann Fam Med* 11(5):402-405.

Singh, Gopal K., and Mohammad Siahpush. 2002. "Ethnic-Immigrant Differentials in Health Behaviors, Morbidity, and Cause-Specific Mortality in the United States: An Analysis of Two National Data Bases." *Human Biology* 74(1):83–109. doi: 10.1353/hub.2002.0011.

Siddiqi, Arjumand, Daniyal Zuberi, and Quynh C. Nguyen. 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):1452–59. doi: 10.1016/j.socscimed.2009.08.030.

Singh, Gopal K., and Barry A. Miller. 2004. "Health, Life Expectancy, and Mortality Patterns Among Immigrant Populations in the United States." *Canadian Journal of Public Health* 95(3):I14–21. doi: 10.1007/BF03403660.

Sheth T, Nair C, Nargundkar M, Anand S, Yusuf S. 1999. "Cardiovascular and cancer mortality among Canadians of European, South Asian and Chinese origin from 1979 to 1993: An analysis of 1.2 million deaths." *CMAJ* 161(20):131-38.

Townsend, Peter, Nick Davidson, and Margaret Whitehead. 1990. “Inequalities in Health: The Black Report and the Health Divide.” London, England: Penguin.

Veenstra, Gerry. 2009. “Racialized Identity and Health in Canada: Results from a Nationally Representative Survey.” *Social Science & Medicine* 69(4):538–42. doi: 10.1016/j.socscimed.2009.06.009.

Viruell-Fuentes, Edna A., Patricia Y. Miranda, and Sawsan Abdulrahim. 2012. “More than Culture: Structural Racism, Intersectionality Theory, and Immigrant Health.” *Social Science & Medicine* 75(12):2099–2106. doi: 10.1016/j.socscimed.2011.12.037.

van Doorn, N., & Vijay, D. 2021. “Gig work as migrant work: The platformization of migration infrastructure”; *Environment and Planning A: Economy and Space*, pp. 1-21.

Wilson, W. J. 1987. *The truly disadvantaged: The inner city, the underclass, and public policy*. University of Chicago Press.

Zuberi, Dan, 2006. Differences That Matter: Social Policy and the Working Poor in the United States and Canada. Cornell University Press, Ithaca, New York.