MEASURING THE SOCIAL DETERMINANTS OF HEALTH FOR YOUNG BRITISH COLUMBIAN ADULTS, 1976-2016

by

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Abstract

BACKGROUND: Out of a concern that social determinants of health (SDOH) for young British Columbian adults are in decline, this project aims to explore any intergenerational inequities in SDOH for young adults that may or may not have arisen between 1976 (when the "baby boom" cohort came of age as young adults) and 2016.

METHOD: This work is done by visualizing and discussing temporal trends in population-level observational data that describe the SDOH for young British Columbian adults aged 25-44, between the years of 1976 and 2016. Age-adjusted aggregate and per capita revenue and expenditure at the federal and provincial levels are explored, as is public and environmental debt. RESULTS: More recent younger generations in BC face worse social and economic conditions compared to a generation ago, and have made notable individual-level adaptations to cope. Public policy has been slower to adapt for younger generations, with provincial and federal governments prioritizing spending on an older demographic. Public and environmental debts have increased and grown less sustainable over the past 40 years.

DISCUSSION: The majority of new public investment has gone to those over age 65, even though that group enjoys greater ability to pay than age cohorts immediately before and after it. My findings propose two key policy options: first, the conditions younger adults in BC face are largely modifiable through a concerted public policy response that shifts revenue generation and/or social spending in ways that reallocate from older to younger; second, a health in all policies analysis invites us to reconsider the continued growth in health care spending, instead allocating new revenue towards social spending such as child care and public transportation.

Lay Summary

This thesis examines changes in the social determinants of health for young adults aged 25-44 in British Columbia between 1976 and 2016, and the individual and public policy adaptations that corresponded with them. My findings suggest that more recent younger generations face worse social and economic conditions compared to a generation ago. My findings further suggest BC has not equally prioritized the needs of younger and older generations in its budgets over the last 40 years, favouring the needs of older adults in the Baby Boomer generation. My findings also imply that public and environmental debts have grown both larger and less sustainable over time. I also find that public expenditure and revenue collection in British Columbia has favoured older adults over younger ones, I argue that there needs to be a re-balancing of priorities to account for the current inequality in revenue generation and spending between generations.

Preface

The research, writing, and data analysis undertaken in this thesis was conducted entirely by the author.

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List of Abbreviations

- BC British Columbia
- CPI Consumer Price Index
- CPP/QPP Canada Pension Plan/Quebec Pension Plan
- DNA Deoxyribonucleic Acid
- FFS Fee-for-service
- FTFY Full-time Full-year
- GDP Gross Domestic Product
- HiAP Health in All Policies
- LFS Labour Force Survey
- OAS Old Age Security
- OECD The Organisation for Economic Co-operation and Development
- SDOH Social Determinants of Health
- SES Socioeconomic Status

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Dedication

I would like to dedicate this thesis to my parents. Thank you for your love and encouragement.

Chapter 1: Introduction and Context

1.1 A Context and Motivation for Intergenerational Equity Work

In this thesis, I analyze trends in the social determinants of health (SDOH) for young adults (age 25-44) living in British Columbia (BC) between 1976 and 2016, both descriptively and visually, to investigate change and the associated policy responses that such changes invite from the perspective of promoting population health. I use three sets of theoretical literatures to ground my analysis: first, the social, economic, and psychosocial theories of Hertzman that describe how social conditions shape the health of individuals and populations alike; second, the Health in All Policies literature that describes how policymakers can shape SDOH through policy choices; and last, the ethical literature on intergenerational inequality that directs us to examine the policy response to observed changes in the standard of life and work for younger people over time, and detect whether government has sufficiently responded to these changes. In short, my study examines the question, "are the observed snapshots and historical trends of the SDOH in BC compatible with the demands of intergenerational justice, given that social policy can affect the levels of SDOH"?

Popular media commentary has increasingly focused on the modern "entitled millennial," claiming that Generation Y – those born between the early 1980s and the mid-1990s – are causing the demise of countless long-standing institutions, from the diamond industry to chain restaurants.^{1,2} This pop commentary has even been adopted in the academy - sociologist David Finkelhor, for instance, coined the term "juvenoia" – a concern from older generations that modern youth are morally corrupted due to the influence of media and the internet in their upbringing.³ While this discussion tends to attract broad attention and interest, it is typically limited by a narrow focus on features that are allegedly uniform across an entire generational

cohort, or "compositional features," in population health terms.⁴ For instance, younger adults are broadly derided for being too entitled and self-centred, with limited evidence to corroborate this cohort-wide generalization.⁵

It may indeed be that the ceiling for prosperity in wealthy Organization for Economic Cooperation and Development (OECD) nations has never been higher, even for youth – Mark Zuckerberg having notoriously made his first billion dollars in 2008 at age 23.⁶ However, the question of whether a single young person today has a higher income than a young person who came of age in the 1970s is a distraction from what may actually be a broader trend toward declining economic and social outcomes at a group level between these two cohorts. The public narrative's focus on individual-level stories and outcomes has limited our ability to effectively assess population-level trends and their impact on generational cohorts over time.

Distinctly absent from this public media discourse is a data-driven, substantive exploration of the broader economic and policy trends that are occurring at a group level for younger people living in BC. Indicators such as income and employment stability comprise the "contextual features" that shape the conditions of living for younger people – conditions that the population health literature identifies as the social determinants of health. The SDOH are defined by the World Health Organization as "the conditions in which people are born, grow, live, work and age...[and] are shaped by the distribution of money, power and resources at global, national and local levels."⁷ Current literature around the SDOH implies that a measurable deterioration in the standard of living for younger generations would give rise to negative consequences for the health of British Columbians and their offspring. If the SDOH decline for younger adults, there is much reason to be concerned about how their generation and future offspring will fare on population health outcomes like life expectancy and early morbidity. This thesis will describe

trends in the SDOH for young people within BC, in response to the question: have SDOH gotten better or worse over the past generation?

Initial work on intergenerational inequality in Canada conducted by Dr. Paul Kershaw of Generation Squeeze suggests that the SDOH for younger Canadians have been deteriorating, particularly in the arenas of housing affordability, wage growth, and childcare costs, leaving many Canadians "squeezed for both money and time."⁸ This project aims to build on this critical work by exploring these and other SDOH in BC in greater depth.

To this end, this thesis examines the extent and direction of temporal trends in the SDOH for young adults living in British Columbia between 1976 and 2016, paying attention to any intergenerational inequities that may have arisen throughout this period. This work is done by visualizing and discussing temporal trends in population-level observational data that describe the conditions of life and work for young BC adults primarily aged 25-44, the age at which young adults begin to enter both their early career with its higher potential for earnings, as well as the typical age range at which they have their first children. I also examine the response to changes in SDOH at both the compositional (i.e., individual) as well as the contextual (i.e., societal or public policy) levels of adaptation, paying attention to policy investments made at both the federal and provincial levels of government.

1.2 A Brief History of The SDOH Idea

The idea that health is influenced by social conditions, and that social inequalities lead to health inequalities is not a new one. The French physician Louis-René Villermé observed in 1830 that mortality patterns were almost perfectly correlated with the degree of poverty in the arrondissements (administrative districts) of Paris.⁹ The English social reformer Edwin Chadwick noted the differences in living conditions between tradesmen and labourers in 1842

England and their subsequent impact on life expectancy.¹⁰ Friedrich Engels' work, *The Condition of the Working Class in England,* meticulously documented the working and living conditions of the British Working Class between 1842 and 1844. Engels found that the ill health workers faced was directly linked to their conditions of employment and housing, and argued that the system of capitalism effectively forced workers into these conditions with little alternative or recourse beyond starvation.¹¹

In 1848, Prussian physician Rudolph Virchow was tasked with writing a report on the typhus epidemic in Upper Silesia. Upon investigating this phenomenon, Virchow noted that the epidemic was intrinsically linked to people's living and working conditions – particularly substandard housing. His proposed solution was revolutionary and transformative – he called for policies that stressed "full employment, higher wages, the establishment of agricultural cooperatives, universal education, and the disestablishment of the Catholic Church" as a lasting solution to the region's material inequities and poor health outcomes.^{12–14}

In Canada, the 1974 Lalonde Report first pushed the medico-public health establishment to consider broader factors beyond individual biology that shape health and disease within populations. The report pointed to lifestyle choices as the primary risk factors that affect population health, rather than advancing an understanding of population-based approaches and causes as outlined by Geoffrey Rose.^{15–17} The distinction is that Rose's population strategy focuses on shifting risk factors within a population through modifying environments and social context, rather than targeting individuals who are at high risk, and attempting to modify their individual behaviours to promote population health. Nonetheless, this was a dramatic shift in thinking toward acknowledging the role of broader forces in shaping and constraining the lifestyle choices of entire populations, or groups therein.

More recently, one can observe the SDOH obtaining broader appeal and utility both within Canadian mainstream political discourse and within the medical community. Across Canada, physicians have been adopting region-specific forms of a poverty "screening tool" first developed by Toronto-based family physician Gary Bloch.^{18,19} Family physician and Saskatoon Meewasin MLA Dr. Ryan Meili is one example of many politicians who invoke "upstream factors" in describing the relationship between poverty, social inequality, and health.²⁰ It is important to remember that while the SDOH have increased their appeal within medical and political circles, the idea of SDOH is one with a long history within public health and social movements.

This thesis builds on the storied history of SDOH scholarship by directing our attention to the contribution of SDOH such as housing wealth, education, employment, and earnings towards population health, paying particular attention to how these have changed for younger people in BC over time. I provide a more detailed theoretical discussion of what the SDOH are and how they shape population health in *Chapter 2*.

1.3 Hypothesis

I hypothesize that some SDOH will have improved (for example, educational attainment) over time for the current cohort of young British Columbian adults, but overall the measures will trend toward increasing inequity between generational cohorts, and a general decline in the living standard for younger adults. Based on the previous work done at the national level by Kershaw,²¹ I also anticipate that governments will have prioritized investments toward older adults over 65 in comparison to the population under 45.

1.4 Research Questions

The three theoretical literatures that guide this work help demonstrate three key ideas: first, that social and economic resources, or SDOH, are fundamental toward shaping population health; second, that policies that shape the availability and distribution of the SDOH are the available levers through which people can modify population health outcomes; third, that there may be some fundamental degree of inequity at play in what is occurring with the SDOH, and associated policy responses, for younger generations now compared to the past. This project therefore proposes to explore three inter-related research questions:

- What are the observable population-level trends related to the SDOH of young British Columbians from 1976 to 2016?
- 2. What have been the apparent individual- and public policy-level responses to these trends over time?
- 3. Did changes in government spending align with the insights and recommendations of the SDOH, HiAP and Intergenerational justice literatures – especially when considered in light of the SDOH changes I examine over the 4 decades?

Note that my thesis does not attempt to test a theory of intergenerational justice, SDOH, or health in all policies; I employ these theoretical frames to analyze and interrogate the government spending patterns that have coincided with the four-decades long pattern in SDOH I observe.

Chapter 2: The Social Determinants of Health: Why and How Social Conditions Shape Population Health

The following chapter motivates the exploration of trends in the Social Determinants of Health (SDOH) for younger British Columbians by exploring three theoretical literatures: the SDOH, Health in All Policies (HiAP), and intergenerational justice. In the first section, I explain what the SDOH are and how they shape the health of populations, thus connecting an examination of trends in the standard of life and work for young people with population health outcomes. In the second, I unpack how SDOH can be shaped by human action through public policy choices, and a prioritization of a HiAP approach. In the third section, I explore the ethical context of intergenerational inequality, situate this project within the broader conversation around intergenerational fairness, and offer some potential ethical principles that help guide my discussion of intergenerational inequality in British Columbia.

2.1 What are the SDOH?

The SDOH are broadly defined by the World Health Organization as:

"The conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries."²²

Different lists of SDOH have been proposed in the literature. *Table 2.1* shows the ones proposed by Richard Wilkinson and Michael Marmot in *The Solid Facts*,²² by Juha Mikkonen and Dennis Raphael in *Social Determinants of Health: The Canadian Facts*,²³ and by the Public Health Agency of Canada:²⁴

Authors	Wilkinson and Marmot	Mikkonen and Raphael	Public Health Agency of Canada
List of SDOH	 The social gradient Stress Early life Social exclusion Work Unemployment Social support Addiction Food Transport 	 Income and Income Distribution Education Unemployment and Job Security Employment and Working Conditions Early Childhood Development Food Insecurity Housing Social Exclusion Social Safety Network Health Services Aboriginal Status Gender Race Disability 	 Income and Social Status Social Support Networks Education and Literacy Employment/Working Conditions Social Environments Physical Environments Physical Environments Personal Health Practices and Coping Skills Healthy Child Development Biology and Genetic Endowment Health Services Gender Culture

 Table 2.1 Various Lists of the SDOH.

Table 2.1 offers a glimpse into some potential SDOH, and illustrates the general categories under which social conditions affect health. I present three different sources to offer a general overview of SDOH, and also highlight that there is some degree of flexibility in choosing which SDOH to focus on over time. The above lists provided a set of guidelines through which SDOH were considered for this project. These lists, however, do not explicitly name what is perhaps the most important social determinant of health – that which shapes other SDOH – government policy. Policy is the "determinant of the determinants," as it shapes the quality and availability of SDOH in society.²⁵ It can be considered an SDOH itself, as it is shaped by the social decisions of human actors – typically policymakers given authority to decide on what constitutes a public problem in contrast to an individual one.

In the following section, I explore the idea of a social gradient in health, as well as internal theoretical debates over causality and causal mechanisms at play. Attention is paid to

these mechanisms to help clarify how social determinants of health have been theorized to affect the biological health outcomes of both individuals and populations alike.

2.2 The Social Gradient

Broadly speaking, the social gradient is concerned with the impact of social inequality on population health outcomes. Regardless of how health outcomes are measured, there exists a stepwise effect whereby each social class (whether measured by SES, income deciles, quintiles, or wealth) has better health than the one below it, and worse health than the one above it. This effect is often visualized as a ladder, where those with the highest SES and greater health, on average, are on the top rung, and the lowest SES and sickest groups sit on the bottom. This effect has remained constant over the 20th century, despite the principal causes of death radically changing over that period.²⁶

Generally speaking, the greater the degree of social inequality, the worse the degree of inequality in health outcomes – often termed "health disparities" in US-centric literature. In general, countries that exhibit higher inequality tend to see worse outcomes than more equal nations, even among their higher-SES citizens.²⁷

The social gradient in health indicates that the highest rates of morbidity for any given health outcome will be found in the lowest status group (i.e. lowest income quintile/decile). Yet while this group may have the highest rates or proportion of overall ill health and death, the overall majority of cases of morbidity and mortality are spread out across the entire population at lower rates.²⁶

There are two key implications that follow from this understanding of the social gradient: first, that interventions will *de facto* miss the majority of cases of morbidity and mortality if they only target the poor or lowest SES group. Second, population-level public health interventions

are often aimed at the majority of people with a given morbidity. Concurrently, the greatest barriers to accessing resources/services/supports exist for those most disadvantaged, so that support systems tend to be used the most or most effectively by the non-disadvantaged. Proportionate universality is an approach that attempts to reconcile both of these implications as a matter of formal policy. This entails a universal, population-level approach, thus treating the majority of morbidities, as well as a specialized, more targeted approach in order to provide additional supports to groups with higher proportionate need, and unique barriers and social circumstances.²⁸ This informs the approach taken in this paper: rather than solely focusing at inequality and those at the bottom of the social ladder, an analysis of SDOH over time needs to consider the entire population's living conditions, and reflect on how to tackle both the most disadvantaged groups, as well as those in the middle of the income distribution.

2.3 Causal Explanations for the Social Gradient in Health

How then, do we account for why social conditions shape the health of populations in a monotonic, step-wise fashion? We can clearly observe this association both within and between nations, but there exist several explanations that have been offered to explain the causal pathways and mechanisms through which social determinants "get under the skin" of individuals, and consequently shape the health of entire populations.

The following section explores these downstream casual pathways, and provides an understanding of why factors such as education or housing tenure have such an important influence on the health outcomes. As Hertzman outlines, these theoretical explanations tend to fall into one of four different categories, which include lifestyle/behavioural approaches, the physical environment, access to health care services, and "social-economic-psychosocial."²⁶

They are presented below in this order, with the final category being the one that is most relevant towards understanding changes in the SDOH over time.

2.3.1 Individual Lifestyle/Behavioural Approaches

The first explanation for why we observe a social gradient in health outcomes is centred on individual lifestyle/behavioural approaches. Under this framework, the social gradient in health is explicable by differences in individuals within each group – those who are poorer being more likely to smoke, eat unhealthy foods, and engage in little to no physical activity. Health promoting behaviours are generally more common in higher-SES individuals and healthdamaging behaviours are more common in those with low-SES. The behavioural approach is often adopted either implicitly or explicitly by the public health establishment, as it fits within prevailing theoretical frameworks that operate on the basis of individual-level behavioural change.²⁹ It also echoes neoliberal philosophical attitudes within society that place the responsibility for health squarely with the individual, and ascribe a moral weight to an individual's failure to make healthy living choices.³⁰

However, the lifestyle approach fails to explain several pieces of evidence. For one, we know that the gradient is not limited to those diseases with a strong lifestyle component such as lung cancer. Furthermore, even when we focus on such diseases, the effect of class on the gradient persists when we control for behavior.²⁶ While health-related behaviors are shaped by social factors, such as income, education, and employment,³¹ a theory that considers behavioural approaches alone falls short in explaining the entirety of the social gradient in health.

2.3.2 The Physical and Built Environment

The second of Hertzman's explanations for the social gradient in health focuses on the physical and built environment. This approach posits that there are different exposures across

social groups in physical, chemical, and biological agents that affect health within these groups. There is often an element of interaction between the physical environment and lifestyle approaches – for example, low income neighborhoods often have more liquor stores, fewer opportunities for exercise, and provide less access to affordable nutritious foods.^{32,33}

Certainly place plays a key role in distributing risk across social class, although as with behavioural approaches, much of neighbourhood residence and workplace spatial risk is predicted by one's social class position.^{34,35} Critical SDOH disabilities scholars help articulate the lived experience of people with disabilities, arguing that both the built environment and the social norms that we hold around "abled" versus "disabled" bodies are equally important as social determinants of health.³⁶

2.3.3 Differential Access to Health Care Services

The third explanation – and notably the one that receives much of the attention from the medical establishment – is differential access to health care services. At a population level, this explanation appears to have only limited utility - while there are SES differences in access and utilization patterns even in countries with universal health care systems, the amount of "medically avoidable" death accounts for a very small amount of the overall gradient in health outcomes. One review found that medical care was responsible for only 10%–15% of preventable mortality in the U.S.³⁷ However, there is clearly a social class component to accessing care in Canada. As Mikkonen and Raphael outline in *Social Determinants of Health: The Canadian Facts:*

"Canadians with below-average incomes are three times less likely to fill a prescription due to cost and 60% less able to get a needed test or treatment due to cost than above average

income earners. Even average-income Canadians are almost twice as likely to have problems getting prescriptions filled and paying medical bills than above average-earners.²³ An overreliance on this explanation has potentially limited the extent of social spending in favour of funding the health care system. A new study in *CMAJ* demonstrates that increased social spending (compared to health spending) is associated with a decrease in potentially avoidable mortality, and an increase in life expectancy.³⁸ This drives home the importance of shifting the focus of health policy from health care to *social policy as health policy*.

2.3.4 Social, Economic, and Psychosocial Conditions

Hertzman refers to the fourth explanation as "social, economic, and psychosocial conditions," or "SEP conditions."²⁶ This broad category is the domain of much attention within the past two-plus decades of SDOH research. Within SEP conditions, several overlapping frameworks have been advanced to explain social inequalities in the distribution of health and disease: psychosocial, materialist/neo-materialist, and eco-social.

The psychosocial framework posits that health inequalities arise from preventable and unequally distributed psychosocial stressors, stressful conditions of daily life, and deficits in social support and coping styles. These operate on a relative basis, regardless of how much above or below an absolute level of material security one operates.^{39,40} In other words, it's not about the purchasing power that your salary provides – it's the resultant stress that having less resources compared to your peers and neighbours creates, due to less "self mastery" (control over one's life conditions, less autonomy in the labour market and workplace, etc.). A psychosocial process is implicated when low income or low social standing leads to loss of self-esteem and feelings of worthlessness that affect health via direct psychobiological processes or through modified coping behaviours and lifestyle choices. A major study that advanced this

framework was the Whitehall Study of civil servants in the United Kingdom, which demonstrated that occupational status was directly associated with cardiovascular disease and all-cause mortality.⁴¹

The materialist/neo-materialist framework posits that absolute, rather than relative, differences in income and living conditions explain the relationship between SES and health. This camp tends to put a primacy on class analysis in explaining observed differences in health outcomes.^{42,43} This framework considers the "fundamental causes" that shape living conditions at any given time. They propose that economic systems (such as capitalism) and policy contexts (such as neoliberalism) shape and constrain the underlying relationship between social determinants and health outcomes.^{44–46} This camp argues that the focus on income inequality neglects the context out of which those income inequalities are generated by neoliberal policies.⁴⁷ Those in the neo-materialist camp do "not deny negative psychosocial consequences of income inequality...they argue that interpretation of links between income inequality and health must begin with the structural causes of inequalities, and not just focus on perceptions of that inequality."⁴⁸

The eco-social framework is an emerging multi-level approach that was pioneered by Nancy Krieger in 1994.⁴⁹ Such multi-level theories aim to "develop analysis of current and changing population patterns of health, disease and well-being in relation to each level of biological, ecological and social organization."^{50,51} In other words, they provide an explanation for observable health and social inequalities all the way from the cell to the society. Krieger uses the idea of "embodiment" to describe how "we literally incorporate biological influences from the material and social world" and argues that "no aspect of our biology can be understood divorced from knowledge of history and individual and societal ways of living."⁵⁰ The eco-social

framework discards with the idea that nature and nurture are in opposition, and suggests that embodiment is "structured simultaneously by: societal arrangements of power and property and contingent patterns of production, consumption, and reproduction, and constraints and possibilities of our biology, as shaped by our species' evolutionary history, our ecological context, and individual histories, that is, trajectories of biological and social development."⁵⁰

The three frameworks listed within this section have some degree of overlap, and are all of utility in understanding the way in which social position and stratification shape health. Their theoretical contributions form the basis of our understanding why SDOH (and the social policies that shape SDOH) are such important drivers of population health, and thus inform the implicit understanding that an exploration of social and economic trends is implicitly an exploration of the trends that shape population health over time.

2.4 SDOH And Reverse Causality

A common concern from those skeptical of the SDOH and SDOH-driven policy rationales is that scholars fail to consider how causality might flow the opposite way, from poor health to low social position. This explanation – that poor health leads to negative outcomes in social status – is easily dispensed by available evidence.⁵² The gradient in health outcomes persists regardless of how social class is measured – be it education, income, or occupation.²⁶ There is evidence that childhood socioeconomic status (SES) negatively impacts adult health outcomes, regardless of the socioeconomic level attained as an adult.⁵³ This idea of early experience "embedding" itself in biology is unpacked in the following section. Additionally, while some childhood diseases are sufficiently debilitating that they may impact educational attainment and later socioeconomic status, these conditions are sufficiently rare enough to be a feasible explanation for the broad gradient effect observed across the entire population.⁵⁴ This

theoretical explanation is therefore of limited usefulness in helping us understand the relationship between economic conditions and future health outcomes for younger British Columbians.

2.5 SDOH and the Life Course

Why might we specifically choose to focus on the SDOH of young British Columbians? The answer to this question lies in the "life course" approach to SDOH, which elucidates the way in which SDOH can shape individual health outcomes and trajectories in different ways over their life course. This is especially important for an analysis of generational trends in young people's SDOH over time, as declining conditions for current young adults of childbearing age has a direct impact on shaping health outcomes for the next cohort of children in BC.

This growing field of life course research has examined the extent to which social determinants operate within a critical early period of human development, strongly affecting later outcomes in adulthood.⁵⁵ This is especially important for an intergenerational analysis, as it motivates policy investment in younger generations, as policies geared toward improving the critical early period of human life yields significant value for money, potentially improving outcomes and trajectories across the lifespan. Life course research relies on a concept known as "biological embedding" to explain two major theoretical pathways through which early experience gets under the skin and affects later outcomes: the latency model, and the pathways model.

2.5.1 The Latency Model

Latency generally refers to a relationship between an early life exposure and later life stage outcome, regardless of intervening life course experience. The latency model is predicated on animal research into stress pathways, epigenetics, and DNA methylation undertaken by Weaver and colleagues at McGill University.⁵⁶ This research found that rat pups (infants) that
were handled and licked by their mothers were found to have a protective neuroendocrine response against later life stressors and elevated cortisol. Most importantly, the rat pups that were not licked lacked this "stress buffer," and the handling effect could not be replicated after the pups had aged beyond the critical early period. As Hertzman describes the latency model, there is a "discrete time, early in life, when the right things must happen, or else it is 'all over."^{26,53} This model explains the causal pathway that links how early childhood stress leads to methylation of genes, impacting gene expression and causing maladaptive (and mostly irreversible) stress reactivity. When such individuals experience chronic stress later in life, their health worsens due to chronic inflammation, leading to a higher incidence of chronic disease such as CVD, malignancies, diabetes, and the like.

2.5.2 The Pathways Model

The pathways model emphasizes the role of cumulative life experiences and how early advantage begets later advantage. For example, Stanford researchers found that by 18 months of age, toddlers from low-SES families were already several months behind higher-SES children in language proficiency – the exposure to a greater degree and frequency of vocabulary from more educated parents already sets those children up for later success in school.⁵⁷ Parental social class also influences the quality of schooling and available social networks that are critical to later success.⁵⁸ The cumulative effect that early advantage confers on later advantage is quite intuitive to understand; students start further ahead in school, often granting them further opportunities for scholarship and higher education. These benefits in turn lead to greater social capital with which to attain better-paying jobs, and afford a higher standard of living in a better neighbourhood, and so on.

2.5.3 Implications of Life Course Approaches for Younger Adults in BC

With these two models in mind, one cannot help wonder: are we setting up the next generation of children in British Columbia for poorer health outcomes than prior generations? Might these inequitable levels of health imply poorer outcomes than would be achieved in a just society? If the SDOH for younger adults entering their childbearing age are indeed declining, as popular media commentary would suggest, this could have major implications not only for the parents themselves, but also for the health of subsequent generations within BC, as the next generation of children may be subject to a greater degree of psychosocial stress in the parental home. Such a decline in SDOH could also create potentially avoidable issues for the health care system and require additional spending on social services. Furthermore, as a society we have agency to control our response to these potential trends. Thus, we must examine whether public policy is responding as effectively as it can to changing conditions in the SDOH, and whether government explicitly sets out to shape population health through its policies. This is the chief aim of a Health in All Policies approach, the subject of the following section.

The next section also builds upon the aforementioned theoretical frameworks used to understand the SDOH and relates it to a policy context, helping us understand how the choices made at various levels of government can shape population health outcomes – a fundamental motivation for why one might wish to examine SDOH trends over time in a given jurisdiction.

2.6 A Health in All Policies Approach

This project employs a health in all policies (HiAP) analytical perspective, which anticipates the population health effects of policy choices outside the traditional domain of health and health care (i.e., beyond the Ministry of Health).^{7,59} Any project that aims to undertake an assessment of the SDOH and population health needs to include some degree of HiAP analysis;

the task of examining SDOH for young British Columbians over time necessitates an examination of the policy response that has (or has not) taken place in response to changing social conditions for younger adults over time. This project employs such a perspective by examining the governmental policy response vis-à-vis investments in postsecondary and elementary education, health care, childcare, parental leave, and retirement.

This project employs Hertzman's "SEP conditions" to help us explain how SDOH get under the skin of individuals, shaping their health and the health of populations. Hertzman's model also teaches us that there are particular sensitive periods across the life course during which human beings are especially sensitive to their conditions of living, which is why policies that improve the SDOH for young adults as they enter their prime childbearing years are so critical to improving their children's future population health.

But to understand how these SEP conditions relate to politics, policies, and the political economic context, we require an additional theoretical frame that provides a broader view of how SDOH fit into the larger political-economic context, and motivates why a HiAP approach is necessary if we are serious about improving population health: the Dahlgren-Whitehead Model.



Figure 2.1 Dahlgren and Whitehead Model.⁶⁰

The Dahlgren-Whitehead Model helps clarify some elements of the ecological framework mentioned in *Section 2.3.4*, which helps us understand how policies and SEP conditions are related to another. In order to shape the health of individuals and populations, we cannot solely focus on individuals (represented by the centre circle of the "rainbow" diagram), nor can we focus on the lifestyle factors that shape their health (the first "rung" of the rainbow). We must instead shape the outer two "rungs" of the rainbow through modifying public policies that shape people's more distal determinants of health, like education, housing, and working conditions. These comprise the 'macro' level of public policies and general socioeconomic, cultural, and environmental conditions.⁴⁸ Most if not all of these hypothetical policy changes would necessarily take place outside of ministries of health, requiring what has been termed

"intersectoral action."⁶¹ The HiAP perspective specifically focuses on the policies and policy contexts that shape the social determinants of health, and pays particular attention to policies that can directly limit or expand a population's capacity for wellbeing. Policies can themselves be thought of as social determinants, given that they rely on the social decisions (or non-decisions) of political elites and other decision-makers. Policy is how humans can exert control over the other SDOH, as SDOH are amenable to change through various policy levers, including but not limited to taxation policy, labour market and welfare policy, market de-commodification of essential goods, and family policy.^{62,63} What is sometimes termed "healthy" policy generally refers to a set of policies that can positively shape the conditions of health and wellbeing for entire populations, while "unhealthy" policy such as highly regressive forms of taxation can be a driver of negative or unequal social conditions that ultimately lead to negative population health outcomes.

The current Federal Minister of Health has publicly acknowledged the importance of SDOH, suggesting potential openness to a HiAP approach in justifying policy choices.⁶⁴ The idea of HiAP may be gaining appeal in policy circles, yet its widespread implementation is limited by several factors. For one, HiAP and intersectoral approaches to health care require moving some of the funding and staff attention away from one of the largest ministries in Canada (the federal Ministry of Health commands over 12,000 full-time employees and an annual budget of over \$3.8 billion).⁶⁵ Alternatively, it could imply an integration of other traditionally "nonhealth-related portfolios" under the Ministry of Health. Either way, such a sea change would certainly encounter bureaucratic inertia from such a large and historic institution.

Having discussed the importance of a HiAP approach, I now turn to the ethical context for intergenerational inequality, which provides motivation for why we might specifically examine intergenerational trends in SDOH for younger British Columbians over time.

2.7 Fairness and the Ethics of Intergenerational Justice

British Columbia is a province whose population has gradually aged since the previous generational cohort came of age in 1976. The median age has increased by nearly 50% over that period, from 28.9 to 42.1 years.⁶⁶ Even more striking is the growth in the share of the population over 65, nearly doubling over that period from 9.7% to 18.3%.

This demographic shift has given rise to concerns over the medium to long-term fiscal sustainability of public health care and pension programs, especially in light of a shrinking working-age population upon which to collect revenue for these government programs.⁶⁷ But has the demographic shift toward population aging impelled governments to invest in the older population to a greater degree than the younger one? This assumption will be challenged by my study, through examining not only the degree to which governments have prioritized older versus younger British Columbians, but also through examining whether these trends are sufficiently motivated by demographic demand. At the national level, a recent analysis by Vanhuysse ranks Canada among the bottom nine of 29 nations with respect to public financing and intergenerational justice.⁶⁸ No such work has yet to explore the extent to which these findings are borne out at the provincial level, particularly in BC, a wealthy province with an increasingly aging population.

2.7.1 Fairness Across Generations: Ethical Principles

In light of concerns around BC's aging population and intergenerational inequality, there are implicit ethical dimensions to an exploration of intergenerational SDOH over time. If there

are demonstrable changes in the social and economic conditions of younger adults in BC over time, one might expect to see provincial and federal governments recognize these changing conditions and adapt their policies to mitigate their impacts at the population level.

Implicit in a dissection of intergenerational trends in the standard of living is a conception of fairness across generations. I discuss below four intergenerational justice constructs that underscore the discussion of fairness across generations as presented by Kershaw: *the lottery of timing*; *a society for all ages*; *sustainability*; and *Wolfson's rule*.²¹

First, the idea of a *lottery of timing* proposes that the conditions into which a given generation is born and raised are simultaneously variable in quality, historically random, and largely outside the control of that generation. Entering adulthood and one's peak earning and childbearing years at a time of significant economic growth has drastic implications for a generation's ability to afford both essential costs of living and taxation toward government revenues. Conversely, being a young adult at a time when the economy is in recession, wages are in decline, or major costs of living are increasing has drastic negative impacts on their psychosocial and material wellbeing. The lottery of timing concept is predicated on a Rawlsian conception of justice, which argues that a just and fair society resembles one where any individual would choose to willingly enter without the foreknowledge of their social position (i.e., race, class, age, sex, and other relevant individual characteristics).⁶⁹ From this "veil of ignorance," Rawls judges that the obligations of one generation toward its elders, or future generations, will depend on the affluence or scarcity with which they are faced. Thus, as Kershaw argues, it "may be appropriate for a generation to pay more in taxes or transfers than its predecessors, if that generation inherits more affluence than did its parents."21

Second, the notion of a *society for all ages* is predicated on a rights-based framework outlined in both the United Nations' 2002 Madrid International Plan of Action on Aging and the 1989 Convention on the Rights of the Child.^{70,71} Article 5 of the Madrid Plan stresses the rights of older persons to "enjoy a life of fulfillment, health, security and active participation in the economic, social, cultural and political life of their societies."⁷⁰ The *Convention on the Rights of* the Child outlines key protections for children under the age of 18, and explicitly advocates that states should "render appropriate assistance to parents and legal guardians in the performance of their child-rearing responsibilities and shall ensure the development of institutions, facilities and services for the care of children."⁷¹ These policy-driven state supports would be targeted at young adults currently raising children, but would have significant impacts on their children's future outcomes via the life course model of SDOH. A society for all ages is therefore one in which governments simultaneously balance the priorities of aging with dignity, care, and social inclusion, and the investments in the generation currently raising children as a means of improving both their and their children's future population health outcomes. There may be an element of unfairness at play if we were to observe a policy response that solely favoured one age group over another, or unduly neglected the interests of one generation while responding to the needs of another.

Third, the notion of sustainability is invoked, too, within a rights-based framework outlined in the 2013 *UN Report on Intergenerational Solidarity and the Needs of Future Generations*.⁷² This UN document outlines how the issue of intergenerational solidarity is embedded in the concept of sustainable development, and grapples with the state's role in upholding the needs and rights of future generations. While the current legal framework has difficulty prescribing future persons as holders of rights, the communitarian perspective

advances the idea that "we are morally bound to future generations through a shared membership in a 'transgenerational community.'"⁷² The connection to fairness here relates to both environmental sustainability and public finance sustainability vis-à-vis generational stewardship; if one generation leaves the environment and public debt worse off than they inherited it, there could be far-reaching implications for the prosperity and survival of the future generation. Furthermore, the consequences of environmental degradation and climate change may be irreversible, and the time window in which to improve the climate (or in other terms, repay an environmental debt) shrinks with each successive new generation.

Fourth, and lastly, a novel formulation of the golden rule – typically conceived in some formulation as *treat others the way you wish to be treated* – is reconceptualized by Wolfson et al. as the notion that "one generation, when it becomes old and frail, should not expect to be treated any better by its children than it treated its parents' generation in their old age."⁷³ Put another way, the current generation that is 65 and older should not expect greater transfers of public finances largely raised from its offspring (i.e. the working population) than it made to its parents' generation.^{21,73}

This project aims explore whether – at a group level – the various year-by-year cohorts of younger British Columbians from 1976 to 2017 are facing different contextual features: a poorer economy, more debt, higher housing costs, and the like. Public narrative on the subject of intergenerational inequality has become distracted by compositional features, typically thought to be in the domain of an individual's choice: i.e. the current generation's struggles are attributable to their drive, intellect, or lack thereof.⁷⁴ In short, I propose to examine whether more recent generations have either lost or won the *lottery of timing*, and further propose that the conditions younger adults in BC face are largely modifiable through a concerted public policy

response. Through examining the public policy response to changing conditions across the study period, I set out to examine whether British Columbia has upheld the notion of a *society for all ages*. This project captures *sustainability* largely through exploring the extent to which the world that older adults in BC leave their children is at least as good as the one they in their turn had inherited, vis-à-vis public and environmental debt. Lastly, this project explores whether *Wolfson's rule* has been present or absent from public financing and revenue collection in British Columbia, and whether there needs to be a re-balancing of priorities to account for the current imbalance in revenue generation and spending between generations.

Chapter 3: Methods and Analytical Approach

3.1 Study Design

This project aims to examine the extent to which various SDOH are deteriorating or improving across generational cohorts over time in BC. It is done by visualizing and discussing temporal trends in population-level administrative/observational data that describe the conditions of life, work, and play for young BC adults aged 25-44. These age ranges are occasionally broadened given data limitations, and sometimes the population groups aged 45-65, and 65 and above are represented for the sake of comparison. The period of analytical focus spans from 1976-2016, with 1976 as the starting year as it marks the beginning of a five-year period in which the largest section of the Baby Boom generation (those born between 1946-64) came of age (entered their peak child bearing years between 25-44) as young adults. The 1976 starting date therefore makes possible two concrete sets of comparisons: first, to compare the SES of contemporary seniors to the cohort of seniors that preceded them; second, to compare the SES for today's seniors *when they were young* relative to the SES of young people today.

The methodological approach for this project was initially informed by the work done the Quebec-based Generations Institute/Institut des Générations (GI).^{75,76} The Intergenerational Equity Index (IEI) is a tool that quantitatively measures the degree of inequality in the standard of living and economic prosperity between generational cohorts over time.^{75,76}

There are several limitations that are inherent to the index-based approach taken by the Generations Institute. The Generations Institute committee did not specifically invoke the SDOH as an analytic frame, and their variables are thus not adequately suited to an explicit exploration of trends in SDOH over time. For reference, a complete list of the 26 indicators used in the original IEI is available in *Appendix A*. This work foregoes the adaptation of the IEI to a BC

context, primarily because it is not entirely meaningful to produce an index score in and of itself. Without a point of comparison, the aggregate measure risks becoming an abstraction that is devoid of any meaning beyond tracking its own change over time. Thus, this project aims instead to present the available measures as-is to retain theoretical clarity, and then discuss their implications for intergenerational equity.

The primary research questions that initially guided the IEI are:

- Has the living standard for young adults in a given political jurisdiction improved or deteriorated?
- Have power, wealth, and jobs in that jurisdiction been shared more or less equitably across generations?⁷⁵

This project takes as its starting point the research questions that motivated the IEI, but re-frames them in order to gain clarity on broader trends, rather than focusing on the two domains of interest to the IEI – the standard of living and the sharing of power and opportunity. The index approach allowed for a simple, single variable to track across the study period, but in doing so it obscured the "differences that make a difference" in shaping population health.⁷⁷ I posit that a visual and descriptive analysis of the trends in intergenerational SDOH over time helps shine a light on those differences that make a difference, and helps instruct us where we should direct our attention and energy.

3.2 Variable Selection

The IEI divides their measures into two domains: living standards, and the sharing of power, wealth, and employment opportunities. This thesis began selecting variables with these two domains in mind, but sought to further divide the index into several separate and mutually exclusive domains to aid in interpretation and visualization of the data over such a long

timespan. As variables and data were collected, they were sorted for methodological organization and clarity of presentation into five domains:

- Jobs, Income, and Wealth: the trends in employment quality, permanence, status, wages, wealth, and inequalities therein.
- 2. Housing, Families, and Communities: exploring trends for owners and renters, real estate wealth and debt, children in the parental home, and the age-specific fertility rate.
- 3. Education: trends in the rate of postsecondary attainment and student debt.
- Government Response Spending and Policy: the public policy response (i.e. investment) to changing SDOH, including pensions, medical care, and childcare, and education
- 5. Environmental Debts & Climate Change: Per capita carbon emissions, and the remaining time to achieve climate change targets prior to 2050. The environmental inequality and debt piece was added to this analysis as the ethical frame of sustainability helped push this work to include some measure of both climate as well as public indebtedness, each its own measure of debt that future generations must inherit.

I identified analytical areas where the IEI was lacking additional pertinent data on the SDOH for young adults in BC, especially those relevant to SDOH from a HiAP framework. It became evident that in order to examine trends in intergenerational inequality, it would be necessary to both gather data on both the major drivers of intergenerational inequality such as assets and capital, and to measure the disproportionate public policy responses to life-course related issues such as investments in pensions and medical care. The ethical frame of intergenerational justice provides a motivation to examine and scrutinize the largest investments that governments make at different life stages for different age groups. If a gap were to be observed in the public policy

response for older adults compared to younger ones, the importance of equalizing such agerelated spending priorities is directly informed by a life course SDOH analysis. Additional variables that are relevant to SDOH were then included on the basis of their availability through publicly available data sources, such as through Statistics Canada's CANSIM (Canadian Socioeconomic Database) or the Census.

3.3 Data Sources

Data for the Index were gathered from a number of sources, including the Canadian Census, CANSIM (Canadian socioeconomic database from Statistics Canada), BC Stats, CIHI, and the Canada Mortgage and Housing Corporation. Each individual data source is discussed below, with a focus on their sampling method, study design, and exclusions.

3.3.1 The Canadian Census

The Canadian Census is a cross-sectional statistical program administered every five years on years ending in 1 and 6. It enumerates the Canadian population, namely, "Canadian citizens (by birth and by naturalization), landed immigrants and non-permanent residents and their families living with them in Canada. Non-permanent residents are persons who hold a work or student permit, or who claim refugee status."⁷⁸ With the exception of the 2011 National Household Survey, the short-form of the Census is mandatory with a 100% sample of the population.

The long-form of the Census is conducted via a systematic random sample of a quarter of all private dwellings in Canada. The Census excludes a number of populations, including "persons living outside Canada (as described above) and excluding persons living in collective dwellings...either institutional, such as hospitals, nursing homes and penitentiaries, or non-institutional, such as work camps, hotels and motels, and student residences."⁷⁹

3.3.2 CANSIM

CANSIM is a statistical service provided by Statistics Canada wherein publicly available large administrative datasets are provided via a number of different statistical programs. Each CANSIM product consulted in this project is listed independently. The programs utilized by each CANSIM table in this analysis include the Labour Force Survey, the Canadian Income Survey, the Uniform Crime Reporting Survey (UCR), and the Consumer Price Index (CPI).

3.3.2.1 The Labour Force Survey (LFS)

The Labour Force Survey (LFS) is a mandatory cross-sectional sample survey of the noninstitutionalized population 15 years of age and over. The survey is conducted nationwide, in both the provinces and the territories. The LFS excludes those living on reserves and other Aboriginal settlements in the provinces; full-time members of the Canadian Armed Forces, the institutionalized population, and households in extremely remote areas with very low population density. These groups together represent an exclusion of less than 2% of the Canadian population aged 15 and over.⁸⁰ It is used to calculate the unemployment rate as well as a number of other labour market indicators.

3.3.2.2 The Uniform Crime Reporting Survey (UCR)

The Uniform Crime Reporting Survey (UCR) is a census conducted as a mandatory annual cross-sectional survey of all police services across Canada. The UCR only contains crime data that come to the attention of police, and therefore exclude crimes that are undetected or unreported. It is a complete annual census conducted by the Canadian Centre for Justice Statistics (CCJS).⁸¹

3.3.2.3 The Consumer Price Index (CPI)

The Consumer Price Index (CPI) is an indicator of changes in consumer prices experienced by Canadians. It is conducted as a monthly sample survey of families and individuals living in urban and rural private households in Canada, and excludes those living in collective dwellings (see the Canadian Census above for a detailed list). The CPI price sample is obtained from a selection of geographical areas, representative goods and services, and types and locations of retail outlets, to estimate price changes experienced by Canadians.⁸² The exception to this methodology is the imputation of rent quotes, which are collected from a survey of tenants, via a special rent module attached to the LFS.

3.3.2.4 The Survey of Consumer Finance (SCF)

The Survey of Consumer Finance (SCF) is a cross-sectional sample survey intended to gather information on the income and wealth of Canadian citizens. It excludes residents of the Yukon, the Northwest Territories and Nunavut, residents of institutions and persons living on First Nations reserves. It is obtained via a voluntary sample attached to the LFS. The SCF contains an asset-debt module that has been repeated every 5-7 years, and has been linked to the more recent Survey of Financial Security (SFS) in order to observe broader trends regarding wealth, debts, and assets for Canadians.⁸³

3.3.2.5 The Survey of Financial Security (SFS)

The Survey of Financial Security (SFS) is a cross-sectional sample survey intended to gather information on the assets, debts, employment, income and education of Canadian citizens. It excludes persons living in the territories, living on reserves and other Aboriginal settlements, official representatives of foreign countries living in Canada and their families, members of religious and other communal colonies, members of the Canadian Forces living in military bases,

people living in residences for senior citizens, and people living full time in institutions. The SFS uses a multi-stage stratified sampling frame that allows for separate and collective inferences to be drawn about the rural and urban populations of provinces.⁸⁴

For the purposes of reporting, the SFS uses the nomenclature of economic family types, which entails "economic families (a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption) and persons not in an economic family (a person living either alone or with others to whom he or she is unrelated)."⁸⁵

3.3.3 The CMHC Rental Market Survey

The Canadian Mortgage and Housing Corporation (CMHC) conducts the Rental Market Survey every October as a cross-sectional survey with sampling "all urban areas with populations of 10,000 or more, and targets only privately initiated structures with at least three rental units, which have been on the market for at least three months."⁸⁶ This severely limits the ability to generalize rents from purpose-built rental to the much larger private market of secondary suites (such as a basement apartment or full floor of a house).

The CMHC divides rents into row, apartment, and both row (townhouse) and apartment. For the purposes of this document, the combined category rents are utilized to gain a broader insight into what is happening across a spectrum of rents, not just purpose built rental apartments. The rents reported by the CMHC do not include heat and utilities, but instead reflect the rent alone, or the offered market rental price if the unit is vacant.

3.3.4 Canada Real Estate Agency (CREA) Housing Prices

The Canada Real Estate Agency (CREA) tracks home sales that are processed through the Multiple Listing Service® (MLS®). The MLS® Housing Price Index includes transactional data for home sales performed with MLS® Systems at participating Canadian Real Estate Boards and Associations. Transactions are "filtered to include records above 0.5% and below 99.5% of cumulative normal distributions for Sale price, Age, Living Area, Land Area, number of rooms, and number of bathrooms...[and] should a transaction record appear to include internally inconsistent data, it is manually reviewed and amended (scrubbed)."⁸⁷ The CREA calculates the residential average price is by dividing the number of sales by the total dollar volume for those sales.

3.3.5 CIHI National Health Expenditure Database

CIHI provides national as well as provincial and territorial health spending data from 1975 to the present. Spending data are extracted from publicly available documents, including "national and provincial/territorial public accounts, other financial reports, private insurance companies and the firm AC Nielsen Canada, [and] Statistics Canada documents."⁸⁸ CIHI reports national health expenditures on the basis of responsibility for payment, rather than on the original source of the funds – thus federal transfers are included in the provincial expenditure category, given that most health spending is administered at the provincial level in Canada.

3.3.6 BC Stats

BC Stats reports fertility as both the total fertility rate and as age-specific fertility rates. These are extracted from vital statistics records across the province, tracking births and deaths within the BC population. The total fertility rate is "the average number of children that would be born to a woman over her lifetime if (1) she were to experience the exact current age-specific fertility rates (ASFRs) through her lifetime, and (2) she were to survive from birth through the end of her reproductive life. It is obtained by summing the single-year age-specific rates at a given time."⁸⁹

3.4 Data Cleaning and Visualization

Data were obtained in comma separated values format (.csv) and cleaned using a combination of R version 3.3.1, RStudio Version 1.1.383, and Microsoft Excel Version 14.5.4. CANSIM tables were downloaded in full table format and organized using the PivotTable feature in Excel.

3.5 Analysis and Calculation of Measures

This section describes the calculations that were performed on the data, either combining to create a new measure, or some form of analysis beyond presenting what is publicly available.

3.5.1 Inflation-Adjusted Measures

In nearly all circumstances, inflation-adjusted data was calculated using the Canada-wide all-items CPI as the BC CPI provided by Statistics Canada only began its collection in September of 1978. This decision was made to ensure comparability across years. The basic calculation used to inflate or deflate nominal dollars is thus, using the example of inflating 1990 dollars into 2016 dollars:

Inflation Adjusted 2016 Dollars = Nominal 1990 Dollars
$$\times \left(\frac{CPI \ 2016}{CPI \ 1990}\right)$$

3.5.2 Unemployment Rate, 25-34

The LFS and CANSIM report the unemployment rates for 25-29 and 30-34 years separately. However, the aggregate number of unemployed persons and the total population for each group is publicly available, so the unemployment rate for the combined age group for each year was calculated by dividing the sum of the total unemployed population aged 25-34 by the sum of the total population for both age groups.

3.5.3 Proportion of Full- and Part-Time Employment, 25-34

As with the unemployment rate, the same method was utilized wherein the total employed population for each age group was summed, and the proportion of full-time and parttime workers was calculated.

3.5.4 Median Monthly FTFY Income, 25-34

The median monthly income was calculated by dividing the median monthly Full-Time, Full-Year (FTFY) income for a given year by twelve. While this may not be a perfect calculation for workers who are not FTFY, it is understood that this income is being used to represent those workers with stable, full-time work and is thus not representative of those with less secure forms of employment.

3.5.5 Annual and Monthly Minimum Wage Income, All Ages

The annual minimum wage for a given year was calculated by the following formula:

Annual Minimum Salary = (Hours Per Week \times 52 Weeks) – (Holiday +

Statuatory Weeks)

This calculation assumes 35 hours per week of employment and three weeks of combined public and earned vacation. Both of these assumptions are relatively generous, thus this is a still a conservative reflection of how poorly earners on the bottom end of the spectrum fare. The monthly figure was calculated by dividing the annual minimum salary by twelve.

3.5.6 Per Capita and Aggregate Health Spending, Under 45 and Over 65

CIHI's National Health Expenditure Database only reports per capita health spending by age group as far back as 1998. For this reason, age-specific shares of health spending were calculated by projecting trends for known years in order to estimate the age-group per capita and aggregate spending for 1976-1997. The average rate of yearly change was calculated by taking

the difference for each age category for the period reported by CIHI and dividing it by the latest year available (2015). An average yearly rate of change for the period 1998-2015 was then calculated by dividing the preceding figure by 17 years. This rate of change was projected back year-by-year until 1976, and then multiplied for each year by the population in each age group to estimate aggregate health expenditure by age group. Shares by age group – under 45, 45 to 64, and over 65 – were then taken by dividing each combined aggregate spending group by the total spending. The proportions were then used to estimate the share of health spending based on known provincial budget data from 1976-2016.

Chapter 4: Results

This section contains the most prominent findings of the empirical work done to measure the standard of living for young British Columbians from 1976-2016. For a more complete list of all variables explored in this analysis, please consult *Appendix B: Full Results*. Unless stated otherwise, all statistics provided are for the province of British Columbia. Monetary figures have all been inflated to 2016 Canadian dollars via the Canada-wide all-items CPI, unless otherwise specified.

The results are divided into three sub-sections, and respond directly to the first and second research questions featured in this thesis:

- What are the observable population-level trends related to the SDOH of young British Columbians from 1976 to 2016?
- 2. What have been the apparent individual- and public policy-level responses to these trends over time?

Section 4.1 features important indicators of deterioration in young British Columbians' SDOH. Section 4.2 features indicators that may signal improvements in young British Columbians' SDOH and/or individual adaptations to the deteriorations reported in the previous sub-section. Section 4.3 examines how we are adapting to these changing SDOH as a society (in particular, at the provincial and federal levels of government). I generally feature the SDOH trends that reflect the largest percentage changes over the four-decade period. Those with limited change are often reserved for *Appendix B*.

4.1 *The Lottery of Timing:* Key Indicators that Imply Negative Changes in SDOH for Younger British Columbian Adults, 1976-2016

As the knowledge translation and political advocacy campaign Generation Squeeze stresses, "hard work just doesn't pay off the way it used to."⁹⁰ This adage is especially true in British Columbia, where median full time, full-year wages for a typical young British Columbian declined by \$8,717 over the past forty years, after adjusting for inflation. Wages began to flat line in the late 1980s, with the 1985-2014 period averaging \$46,673.



Figure 4.1 Median Full-Time, Full Year Income, 25-34. Source: Canadian Income Survey

The decline in FTFY wages reflects how those with stable, secure employment are faring – it does not reflect the degree of precariousness or security in the job market itself. For many young adults, the length of time spent in part-time work is rising dramatically. Furthermore, no longer is part-time work in BC a temporary phase of casual or flexible labour participation but instead it has become the long-term arrangement for a greater proportion of part-time workers, despite this form of employment being much less likely to carry benefits or security, and more





Figure 4.2 BC Gini Coefficient, 1976-2016. Source: CANSIM Table 206-0033⁹¹

One can observe a marked increase in the adjusted market income Gini coefficient, rising from 0.369 to 0.4 over the study period. This is a concerning trend, given the primacy of income and its distribution as a social determinant of health not just for young adults, but for the entire population as a whole. However, the Gini coefficient is a rather blunt reflection of different income distributions, and its increase may reflect underlying demographic changes such as an aging population. This also fails to capture the extent of wealth inequality between and within generations. Regardless, we know that income as a SDOH is contingent on the purchasing power of said income; thus this decline in wages must be contextualized by examining two major costs of living for young adults that have skyrocketed over this period: tuition and housing.

¹ See Appendix B7 and B8 for more detail.



Figure 4.3 Average Undergraduate Tuition and Fees in BC, 1976-2016. Source: CANSIM Table 477-0077 and Generation Squeeze⁹²

When tuition figures are inflation-adjusted to 2016 dollars, a visible and striking pattern emerges. Tuition fees gradually increased on average over the period from 1976-2000, from roughly \$1,825 for a year of postsecondary to \$3,500. However, they skyrocketed between 2001 and 2004, climbing from \$3,300 to almost \$6,000 for full-time tuition. While the cost of undergraduate tuition has slightly declined in the intervening period from 2006-2014, they still remain at nearly \$5,400 in 2016, a nearly 300% increase compared to 1976. I now explore the amount of debt required to take on this level of educational attainment.



Figure 4.4 Average Student Loan Amount and Average Debt for a Four-Year Degree, 1976-2010. Source: Canada Student Loans Program, Generation Squeeze

Canada Student Loans data demonstrate an average overall increase in student debt over the total period. With median wages in decline, it takes longer to pay off these loans – causing many young adults to prolong living at home while these loans are paid off. It is important to stress that these figures are likely an underestimate of the extent of student debt in British Columbia, as they do not include private bank loans, on which students are increasingly relying. Additionally, greater numbers of students take five or more years to finish their degrees, incurring more debt in the process. We can observe that British Columbian adults are studying longer, in greater numbers, and taking on more debt to do so. In spite of this, median FTFY wages have fallen across the study period. With younger adults studying more to earn less, how has their living situation faired? We now examine the generational trends in housing and accommodation.



Figure 4.5 Average and Median 1 Bedroom Rent in BC, 1990-2017. Source: CMHC Rental Market Survey⁹³

With respect to housing, conditions have changed since the 1970s in two key domains: rentership and ownership. Before examining the intergenerational divide in homeownership and housing wealth, one must focus on the rental market. According to the 2016 Census, over 42% of households in the Greater Vancouver Region were renters, and in 2011 the National Household Survey estimated that just over half of all households in the City of Vancouver were renters.^{94,95} While the CMHC data only permit us to examine purpose-built rental market data beginning in 1990 onward, it still reveals an interesting trend across the province – that average and median rents have climbed from the mid-\$800s in 2005 to over \$1000 a month in 2017. These trends are even more pronounced within the cities of Vancouver and Victoria. Rental accommodation is highly unaffordable at minimum wages across the entire study period, where it fluctuated between 60 and 80% of income dedicated toward shelter costs.

With this in mind, let us examine how the ownership market has performed for young British Columbians over the past 40 years.



Figure 4.6 Average Housing Price in BC, 1976-2016. Source: Canadian Real Estate Association Data

One of the most significant findings across the study period is the drastic rise in housing prices – especially over the period from 2000-2016, where the average housing price jumped from nearly \$300,000 to almost \$700,000. This figure is a conservative estimate, as it includes all housing in British Columbia. The average housing price has risen even more dramatically in the Greater Vancouver Region and in the Capital Region over this period.

While housing prices increased briefly in the early 1980s, they corrected enough for many people to enter into the ownership market through the remainder of the 1980s and early 1990s. The most telling metric to translate the impact of the housing prices trend is to relate it to the number of years required to save for a down payment – the major hurdle for many young adults in order to bridge the gap between renting and owning.





My calculations follow the methodology of Kershaw⁹⁶ which assumes that the typical (i.e., median income quintile) young individual can save 15% of their yearly earnings toward the initial 20% down payment on a home (this 15% being the difference between typical spending on household costs for renters and the 30% shelter cost threshold for core housing need). This analysis is quite conservative in reflecting the nature of young adults' ability to save - recent polling data suggest that 35% of Canadian Millennial aged 18 to 34 have no emergency savings at all, while another 10 per cent have less than a month's earnings in case of job loss.⁹⁷ Regardless, at these rates of saving, the "typical" young adult in 1976 required just shy of five years in order to afford entry into the housing market. In 2016, this number had skyrocketed to eighteen and a half years. This highlights just how out of reach homeownership has become for

many young British Columbian adults. Now we examine how these findings have played out with regard to the homeownership rate, and the wealth accrued from homeownership for young adults compared to the older generation.



Figure 4.8 Rate of Homeownership by Age Group, 1977-2016. Source: Survey of Consumer Finances, Survey of Financial Security

The findings above reflect the reality for most young British Columbians:

homeownership is out of reach, especially in large cities where many jobs are concentrated. In the mid-1970s, nearly 40% of young adults under the age of 35 owned their home. In 2016, this number had fallen to only a quarter. But how has this trend played out for the quarter of current young adults who are buying into the ownership market? Below we examine these trends.





This chart is best understood as reflecting what is commonly termed "equity," or net wealth. One can observe that for those young individuals who owned their homes in the mid-1970s, after factoring out their mortgage costs, they had accrued nearly \$100,000 of value. In 2016, this amount had increased to just over \$372,000 for young adults, and just over \$653,000 for those 65 and older. On first glace, this seems to suggest that for those who have gotten into the ownership market, the returns have been equally shared across age cohorts – or at least the age differences have not significantly magnified over time. This analysis, however, is limited by a crude understanding of net value, which raises the question: what sort of additional debt did each group have to take on to attain this equity? The next section examines this question in more depth. Also, the analysis doesn't consider that a minority of young people own homes, and the rate has been going down. By contrast, three quarters of older Canadians own homes, and the

rate has been going up. So the typical young person isn't gaining any wealth, while the typical older person in BC is gaining considerably more wealth.



Figure 4.10 Mortgage Debt by Age Group, 1977-2016. Source: Survey of Consumer Finances, Survey of Financial Security

This chart helps place the previous two findings in a more appropriate context. Among the small number of young adults who are currently entering the housing market, they are still gaining more equity (in the process, leaving behind three quarters of their peers who are renters), yet the amount of debt younger adults have to take on now vastly outpaces the amount of mortgage debt that was required a generation ago. Thus access to stable, secure, and affordable housing required less debt and time in the labour market for the cohort that came of age in the mid 1970s.^{90,96,98,99} The chart below highlights the sizeable discrepancy between the amounts of debt taken on to get into the housing market between generations.



Figure 4.11 Change in Debt for Extra \$1 of Net Value, 1977 vs. 2016. Source: Survey of Consumer Finances, Survey of Financial Security, Authors' Calculations

As housing prices have risen across BC, older generations have seen their assets increase to historic levels - the typical British Columbian age 55+ enjoying between \$246,000 to \$305,000 more wealth than in 1977.⁹⁰ Yet for their children and grandchildren, while they may have \$331,510 more wealth than their counterparts in 1977, they are saddled with an average of \$172,466 more mortgage debt than a generation ago. When we examine the per-dollar amount of debt required for each of these added dollars of additional value from housing, the intergenerational inequality becomes striking across the period of analysis: those under 35 took on an extra \$0.61 in debt for every additional dollar in net worth, compared with only \$0.06 for those over 65. Those who are able to enter into the housing market as a young adult are seeing returns, to be sure, but they are nowhere near as significant as those who entered the market earlier, reflecting the lottery of timing. At the same time, rents within cities are increasing and

creating pressure on those who cannot get into the ownership market. A growing group of young adults under the age of 35 have to work harder and longer to make ends meet as renters for a longer period of their life, and are struggling to save for an initial down payment for a house. As Kershaw notes, "saving a down payment is one factor in home ownership. Managing mortgage payments is another. Even with historically low interest rates, the typical 25-34-year-old must make mortgage payments that are 15% higher now than in 1976-1980, and do so with full-time earnings that are 8% lower. This change requires an extra month of pre-tax median, full-time earnings."¹⁰⁰ These trends in the affordability of both rental and owned accommodation in BC are deeply troubling.

This section reviewed the observable population-level trends in SDOH for young British Columbians, paying particular attention to striking sources of decline across the study period. I now examine some potential improvements over the same time, and reflect on their relationship to the declining trends over 1976-2016.

4.2 *The Lottery of Timing:* Indicators that Imply Positive and/or Negative Changes in SDOH for Younger British Columbian Adults, 1976-2016

In contrast to these measurable deteriorations in the standard of living, young British Columbians may have also seen some potential improvements in their SDOH over the period. These involve becoming more highly educated than the previous cohort, women participating in the labour market in greater numbers, women exercising greater control over family planning, and an increase in opportunities to live as multi-generational households over the study period.



Figure 4.12 Percentage with Postsecondary Education in BC, 25-44. Source: Canadian Census

There has been a notable escalation in the percentage of young British Columbian adults who hold some form of postsecondary education over the period from 1976-2016. In 1976, only 22% of adults 25-44 obtained a postsecondary certificate or higher, compared with 67% in 2016 – an increase of 45 percentage points, or over 200%. Education is well understood as a SDOH, both contributing to health literacy, adaptability in the labour market, and greater ability to both see and shape the societal factors that shape population health.²³



Figure 4.13 BC Female Employment, 25-34, 1976-2016. Source: CANSIM Table 282-0002¹⁰¹

Over the past 40 years, we can observe greater female participation in the labour market. Over the study period, female employment (between the ages of 25 and 44) rose from 54% to 76%. This finding may reflect changing cultural norms vis-à-vis women's participation in the civic realm, both through their attainment of higher education, and as a form of economic emancipation from the limitations of an historic nuclear family model. This trend toward female employment could yield improvement in their SDOH by means improved income.

Over the study period, we can observe more young men and women are living in the parental home for longer periods of time prior to starting a household of their own, implying an expansion of support from older to younger generations and/or the expansion of living arrangement opportunities. While data on the living arrangements of young adults aged 20-29 are somewhat sparse, there is a notable uptick in young people living at home between 1981 and 2001. A deeper picture of this trend is possible through family composition data from the Canadian Census, which is presented below.



Figure 4.14 Age Distribution of Children Living at Home. Source: Canadian Census
The chart above reflects the greater share of families that report having an adult child aged 25 or older living in their primary residence. Of note is the almost four-fold increase (by 8.5 percentage points) in the number of households with a child over the age of 25. This is captured by the census as a "percentage of families with never-married sons and daughters at home." The figures sum to a total greater than 100%, as each category reflects the percentage of families that have at least one child living in their home within that age range. For example, in 2001, 9% of all households in BC had a child at home over the age of 25. This trend suggests an increase in multigenerational household forms. This trend may reveal positive implications for social inclusion and cohesion, including the diffusion of norms regarding multigenerational homes among some minority ethnocultural groups to the broader Canadian population. Interestingly, *Figure 4.10* also displays a marked reduction in the number of families across BC with young children (less than 6 years and 6-14 years old, respectively), especially between 1991-2011 – a signal that many households are delaying the age at which they are having children. This trend is further explored below.





When fertility rates are further examined by age group, there is a clear trend over the past 30-some years toward a decline in the fertility of women between the ages of 20 and 29, and a marked increase in fertility in women aged 30-39. Unfortunately data on age-specific fertility in BC prior to 1989 are not available at this point, although the trend across just this limited period is striking. We have no reason to believe that it reversed prior to this period – based on national data regarding the age at mothers at first birth, there has been a general trend toward the delaying of childbirth in this country that has occurred at least as far back as 1965.¹⁰² Young families are having children later, which suggests that women and families may be exercising a greater degree of control and freedom over decisions related to family planning, especially vis-à-vis their career.

While the above four indicators reveal several SDOH trends that may be interpreted as notable improvements for younger British Columbians, they may also interpreted as potential

adaptations being made to the observed decline in SDOH over the past 40 years documented in section 4.1. First, the growth in the rate of educational attainment is often regarded as a positive generational attribute. However, it is worth understanding this increase within the context of both the cost of said education, and the benefits that higher education has conferred across this period. As the previous findings demonstrated, this increased educational attainment has not translated to better returns in the labour market. Moreover, higher education now comes with a far greater cost and potential personal debt. Second, greater female participation in the labour market could be seen as one potential adaptation to the decline in male earnings over the period – an adaptation that would improve household income in the face of rising costs of living across BC. Third, the increase in multigenerational households could be perceived as an adaptation to falling wages and rising rents, leading to a "delaying of adulthood." This trend is most prominent in major urban centres, where affordability concerns have increased the rate at which youth are "delaying adulthood" as an adaptation to declining economic conditions. A recent Vancity report highlighted this trend, with even greater numbers of young people living in the parental home in Metro Vancouver, at a staggering 61% in 2016.¹⁰³ Last, we also observed young women and families delaying the age at which they start having children over at least the past 27 years. While reproductive technology has improved over this period, it alone is not a sufficient explanation for the drastic shift in the dynamics of age-related fertility in British Columbia over this period. However, this trend still highlights that we have entered an historical period wherein the reproductive age is rising beyond that which is suitable biologically for the human species (i.e., later fertility is less ideal from a financial and health policy perspective as it is associated with greater rates of miscarriage and complications);^{104,105} and many women report in survey

data that they are foregoing or delaying starting a family due to the rising costs associated with raising children.^{106,107}

Whether these trends imply individual-level adaptation or not, it is still important to place them within the context of major changes in the standard of life and work in BC over the last 40 years. Attempting causal claims regarding individual-level adaptations is beyond the scope of this analysis, yet some of the above-discussed trends highlight some potential area for further exploration. While the response of individuals to changing SDOH is an open and complex question, the ability to discern the policy level adaptations made by government is a more straightforward enterprise. I now examine the public policy response, made at the societal level, to these changes in SDOH for younger people in BC in order to complete the analysis of the second research question prioritized in this thesis.

4.3 *A Society For All Ages, Wolfson's Golden Rule, and Sustainability*: Government Adaptations to Young British Columbians' Changing SDOH

This section explores the public policy response to various age-related trends that occurred across the period of analysis. It examines the degree to which government has responded to trends for older adults in comparison to younger British Columbians, with regard to: retirement savings, health care, primary and secondary education, postsecondary education, and child care. I first present my findings in aggregate, as a percentage of the economy (both provincial and federal GDP, where indicated), followed by the same results on a per capita basis. I also unpack the extent to which young British Columbians have more or less public debt to manage over time, compared to the previous generation.

4.3.1 A Society For All Ages: Aggregate Government Spending and Revenue

The primary programs that maintain and support retirement security for older British Columbian Canadian adults are federally operated: namely, the Canadian Pension Plan (CPP) and the Old Age Security (OAS) program. Parental leave and family income support are also federally administered. These findings are expressed as a share of federal GDP. The elements of aggregate provincial spending (namely, medical care, child care, and education) are expressed separately as a share of provincial GDP.

% Population	1976	1986	1996	2006	2016	Absolute Percent Point Difference 1976 vs. 2016
<45	70.56%	68.62%	65.85%	58.09%	53.80%	-16.76%
45-64	19.77%	19.46%	21.59%	27.84%	28.34%	+8.57%
65+	9.68%	11.92%	12.56%	14.07%	17.86%	+8.19%

Table 4.1. Share of BC Population by Age Group. Source: CANSIM Table 051-0001⁶⁶

	1976	1986	1996	2006	2016
Federal GDP					
(Nominal \$					
Millions)	205,123	524,450	857,023	1,492,207	2,027,544

						Difference	\$ Value 2016
	%GDP	%GDP	%GDP	%GDP	%GDP	%GDP	(millions)
					2016 (or		
					most recent		
	1976	1986	1996	2006	year)	1976 v	s. 2016
REVENUE							
Total Federal							
Government							
General							
Revenue	34.99%	37.60%	40.64%	37.54%	35.55%	0.56%	\$11,349
CPP Revenue	1.60%	2.05%	2.31%	3.07%	3.39%	1.80%	\$36,483
Total	36.59%	39.65%	42.95%	40.61%	38.95%	2.36%	\$47,832
SPENDING							
65+							
OAS	2.10%	2.51%	2.48%	2.04%	2.34%	0.24%	\$4,947
CPP	0.54%	1.45%	2.56%	2.32%	2.93%	2.39%	\$48,501
Total	2.63%	3.96%	5.04%	4.36%	5.27%	2.64%	\$53,448
SPENDING <45							
Parental							
Leave	0.07%	-	-	-	0.19%	0.12%	\$2,418
Family							
Income		-	-	-			
Support	0.98%				1.08%	0.10%	\$2,055
Total	1.05%	-	-	-	1.27%	0.22%	\$4,473
Endoral Dabt	10.20%	E 4 179/	00.10%	20 779/	12 000/	21 6 99/	\$500.405
	17.20%	30.4/%	07.10%	37.//%	43.00%	24.00%	⊅300,405

 Table 4.2. Aggregate Federal Government Spending and Revenue. Source: CANSIM Table 380-0080,¹⁰⁸ 380

0063¹⁰⁹

Provincial GDP					
(Nominal \$					
Millions)	21,300	57,943	111,201	188,236	263,706

						Difference	\$ Value 2016
	%GDP	%GDP	%GDP	%GDP	%GDP	%GDP	(millions)
					2016 (or		
					most recent		
	1976	1986	1996	2006	year)	1976 v	s. 2016
REVENUE							
Total Provincial							
Government							
General							
Revenue	1/0/0/	15 1 20/	14.059/	10.70%	17.000/	0.00%	¢2 500
	10.84%	15.13%	14.05%	18.79%	17.82%	0.98%	\$2,580
		1		1	<u> </u>		
SPENDING							
Medical Care							
to 65+	1.46%	1.91%	2.52%	2.73%	3.10%	1.64%	\$4.328
Total	1.46%	1.91%	2.52%	2.73%	3.10%	1.64%	\$4,328
SPENDING <45							
Medical care							
spending <45	1.63%	2.00%	2.54%	2.36%	2.35%	0.72%	\$1,896
Child Care		_	-	-			
Services	0.05%				0.09%	0.04%	\$117
Elementary &							
Secondary	4.00%	3.55%	4.08%	3.26%	2.41%	-1.59%	-\$4,200
Postsecondary	1.27%	1.07%	0.47%	0.97%	2.15%	0.88%	\$2,309
Total	6.95%	6.61%	7.09%	6.58%	7.00%	0.05%	\$122
LI					1		
Provincial Debt	11.85%	13.49%	25.54%	19.44%	25.67%	13.82%	\$36,433

Table 4.3. Aggregate Provincial Government Spending and Revenue. Source: British Columbia Budgets1976-2016.

Tables 4.2 and 4.3 detail the changes in government spending and revenue generation that have occurred at the aggregate level over the past forty years. Revenue collection has remained fairly stable as a percentage of both the provincial and federal economies (at 14-18%, and 34-40%, respectively) over the study period. In spite of this, the federal government increased national spending on older adults by over 53 billion dollars, almost 5 billion of which comes from general revenue for OAS. The provincial government found an additional 4.3 billion in 2016 toward medical care for the aging population in BC. This increase is driven, in part, by the demographic growth of the 65+ population in both Canada and BC over this period, where they grew by over 8% as a share of the total population in BC. The federal government did grow the amount spent on family income support and parental leave by a combined \$4.4 billion nationally, although this amount will be further scrutinized at the per capita level for young people in BC in the following section.

At the provincial aggregate spending level, similar demographic trends are observable in the absolute growth of the older cohort compared with those under 45. In BC, an additional 771,000 young persons (compared with an additional 604,000 older adults) only drove a total increase of \$122 million in 2016 compared to 1976. The major change over this period is the retraction in elementary school spending, which saw a \$4.2 billion reduction. This retraction occurred within the context of a sizeable decline in the elementary school-aged population (ages 5-17), which fell from 27.5% of the population in 1976 to 14.8% in 2016. Postsecondary education saw a modest increase in the 2016 budget of \$2.3 billion, and child care spending increased by \$117 million respectively. These figures imply increased investment at the aggregate level for young British Columbians, but they require additional context by factoring in the per capita changes that have occurred over the past 40 years.

4.3.2 A Society For All Ages: Per Capita Government Spending and Revenue

The previous section detailed spending and revenue as a share of the overall economy. This gave us insight into certain trends, namely, that at an aggregate level, governments have invested more toward older adults than they have toward younger ones. This section examines those trends on a per capita basis, for the "average BC individual" from 1976-2016.

% Population	1976	1986	1996	2006	2016	Difference 1976 vs. 2016
<45	1,787,896	2,061,072	2,551,410	2,463,986	2,559,504	771,608
45-64	500,842	584,451	836,486	1,180,909	1,348,264	847,422
65+	245,161	358,098	486,421	596,796	849,890	604,729

 Table 4.4. BC Population by Age Group. Source: CANSIM Table 051-0001⁶⁶

	1976	1986	1996	2006	2016	Absolute Difference 1976 vs. 2016	Economic / Demographic Growth Factor
National GDP							
Per Capita (\$)	\$36,114	\$38,315	\$41,804	\$53,919	\$55,876	\$19,762	1.55
Provincial GDP							
Per Capita (\$)	\$34,705	\$37,759	\$41,455	\$52,228	\$55,428	\$20,722	1.60
Postsecondary Education Rate	22%	46%	54%	65%	68%	45%	3.03
Female							
Employment							
Rate	54%	64%	71%	76%	76%	22%	1.41

 Table 4.5. GDP Per Capita, Postsecondary Education Rate, and Female Employment Rate. Source: CANSIM

 Table 051-0001,⁶⁶ 282-0002,¹¹⁰ Canadian Census, Author's Calculations.

Table 4.5 lists several major changes to BC and Canada over the past 40 years: an increase in the size of the economy by roughly \$20,000 per person each year, a threefold increase in the demand for postsecondary education by 45 percentage points, and a 22 percentage point increase in the number of women aged 25-44 currently employed in the labour market. These provide additional context when examining the per capita spending and revenue changes for the "average" individual over time. Table 4.6 below highlights the per capita spending and revenue changes over time for individuals living in BC.

	Per Capita 2016 \$ Adjusted for Demographic Growth						Per Capita 2016 \$ Adjusted for Economic Growth				
	-				2016 (or				T		
					most recent	1976 vs.					1976 vs.
	1976	1986	1996	2006	year)	2016	1976	1986	1996	2006	2016
REVENUE PER											
PERSON											
Total Federal											
Government											
General Revenue	\$12,638	\$14,790	\$16,990	\$20,241	\$19,878	\$7,240	\$19,553	\$22,882	\$26,286	\$31,317	\$325
CPP/QPP Revenue	\$144	\$412	\$823	\$952	\$1,264	\$1,119	\$223	\$638	\$1,273	\$1,472	\$1,040
Total (Federal)	\$12,782	\$15,202	\$17,813	\$21,193	\$21,141	\$8,359	\$19,776	\$23,520	\$27,560	\$32,790	\$1,365
Total BC Provincial											
Gov't General											
Revenue	\$5,845	\$5,714	\$5,823	\$9,812	\$9,877	\$4,032	\$9,335	\$9,125	\$9,300	\$15,671	\$542
		•			•		•		•	•	
SPENDING PER											
PERSON 65+											
OAS	\$8,788	\$9,404	\$8,564	\$8,320	\$7,930	-\$858	\$14,035	\$15,019	\$13,677	\$13,287	-\$6,105
CPP	\$2,243	\$5,445	\$8,871	\$9,464	\$9,911	\$7,667	\$3,583	\$8,696	\$14,168	\$15,115	\$6,328
Medical Care to	· · · ·										
65+	\$5,840	\$6,489	\$8,912	\$10,275	\$9,381	\$3,541	\$9,327	\$10,364	\$14,233	\$16,410	\$54
Total	\$16,871	\$21,338	\$26,347	\$28,058	\$27,222	\$10,351	\$26,945	\$34,079	\$42,078	\$44,812	\$277
							ļ	I		1	1
SPENDING PER											
PERSON <45											
Child Caro Samiana											
Child Care Services	\$34	-	-	-	\$91	\$57	\$55	-	-	-	\$36
Parental Leave	\$50	-	-	-	\$196	\$146	\$80	-	-	-	\$116
Family Income											
Support	\$391	-	-	-	\$735	\$344	\$625	-	-	-	\$110
Elementary &											
Secondary	\$1,968	\$1,952	\$2,567	\$2,928	\$2,481	\$513	\$3,143	\$3,118	\$4,100	\$4,677	-\$662
Postsecondary	\$1,896	\$1,776	\$899	\$2,644	\$2,213	\$317	\$3,029	\$2,836	\$1,435	\$4,223	-\$816
Medical care											
spending <45	\$663	\$931	\$1,394	\$2,102	\$2,547	\$1,884	\$1,059	\$1,487	\$2,226	\$3,358	\$1,488
Total	\$5,004	\$4,659	\$4,860	\$7,675	\$8,264	\$3,261	\$7,991	\$7,442	\$7,762	\$12,258	\$273
			•		•				•		•
PROVINCIAL											
DEBT PER											
PERSON	\$4,114	\$5,093	\$10,589	\$10,152	\$14,228	\$10,114	\$6,570	\$8,133	\$16,911	\$16,214	\$7,658

Table 4.6. Per Capita Government Spending and Revenue. Source: CANSIM Table 380-0080,¹⁰⁸ British Columbia Budgets 1976-2016.

Following the Methodology of Kershaw, I present the per capita budgeting for the policies featured above, adjusting first for demand (brought on by demographic change), and then adjusted for economic growth. The first six columns look at how per capita spending changed, accounting for changes in demand. No adjustments are made for medical care spending, as CIHI data already factor age-adjusted demand into their spending data. The same is true for elementary education, which assumes a consistent enrolment rate across the study period. The next five columns then allow us to investigate how governments used the proceeds of economic growth to change per capita spending, querying whether the funds were used to expand existing programs, build new ones and/or reduce taxes. Positive numbers in the final column represent investment at or above the rate of economic growth either provincially or nationally.

Federal revenue increased by \$7,240 per person over the past 40 years, while funds for C/QPP increased by \$1,119. Given the increase in GDP per capita over the study period, general revenue per person increased by \$325 beyond the rate of growth, as did C/QPP revenue by \$1,040. In 2016, the federal government invested \$7,930 in OAS, which represented 40% of per capita revenue. By comparison, the federal government invested only \$931 per person under 45, accounting for only 4.6% of per capita federal revenue. Provincially, BC invested \$9,381 per person over 65 in medical care, representing 95% of per capita revenue. This finding sits in stark contrast with per capita spending under 45, where the province invested \$2,771 per younger person, representing 28% of per capita revenue. As discussed in the aggregate trends, both provincial and federal governments have taken on additional debt to make up their spending shortfalls.

The initial per capita spending data reveal that for the average BC individual in 2016, after factoring in demand, governments spent over three times as much on those over 65 (\$27,222 per person) compared to those under 45 (\$8,264) – a generational spending ratio of 3.29. This spending ratio held as well when comparing the difference between the amount spent in 1976 versus 2016, with \$10,351 per person over 65 compared to \$3,261 per person under 45 (i.e., a generational spending ratio of 3.17). This ratio reveals that Canadian governments prioritized per capita spending increases for the aging population at a rate that is over three times faster than for citizens under 45. Moreover, the BC government prioritized increases in per capita medical care spending on those over 65 by four times the amount invested in child care, elementary, secondary, and postsecondary education for young people in BC.

Provincial governments invested slightly more now compared to 1976 into medical care per capita for the aging population (+\$54 per person over 65) when we take into account economic growth. The federal government prioritized CPP payments over OAS between 1976 and 2016, ultimately spending \$6,105 less than one might expect if their OAS policy investments kept pace with economic growth. This reflects a greater prioritization of the "pre-pay" model of CPP, which helped take into account the demographic bulge of seniors that are retiring in the present day, thus ensuring that public coffers would not go bankrupt while maintaining retirement security for the current cohort of Canadian seniors. The same degree of pre-planning was not put in place for medical care spending that was for retirement income spending when it comes to anticipating and planning for the demographic bulge. This carries sizeable implications for funds left over today to invest in adaptations to the deteriorating SDOH of younger citizens.

Both over 65 and under 45 per capita spending grew faster than economic growth between 1976 and 2016 (at \$277 and \$273, respectively), however, the growth in the under 45

group was largely driven by increases in medical care spending.² When the additional \$1,488 on medical care for those under 45 is not taken into account, all other social policy spending for young adults in BC fell by \$1,215 per capita below economic growth. This highlights the extent to which BC has prioritized medical care over other social policy investments in younger generations. The discrepancy when leaving aside medical care spending is largely a reflection of the reduction in both elementary and postsecondary spending, especially when taking into account the massive increase in demand for a postsecondary degree now compared to in the 1970s. The provincial government provides \$816 less per person for postsecondary in 2016 per person than in 1976. This loss in per-person postsecondary funding at the provincial level has likely been made up by increases in tuition fees over the study period, thus increasing personal student debt.

Child care in BC in 1976 was at paltry levels of funding both in aggregate (0.05% GDP) and per capita (\$24 per person in 2016 dollars - \$34 if we expected the same level of demand on services then as there are now), and not much has changed over the study period. Factoring in the additional demand from more women entering the labour market, the BC government only provides an additional \$57 per person towards child care. This specifically highlights that governments used economic growth to expand existing programs like medical care and retirement income, rather than build new programs to adapt to new challenges primarily facing younger citizens, such as child care.

² A sensitivity analysis was conducted with CIHI Health Expenditure data to corroborate the reported health spending in the BC Budget. CIHI reported roughly \$1bn more per year in spending than the BC Government. This alternative analysis did not radically alter the nature of the findings for per capita medical care spending, as the general trend of more per capita medical spending for older adults compared to younger adults held true.

Lastly, provincial government debt has grown considerably over the past 40 years. At a per capita level, BC had \$10,114 more in 2016 compared to 1976. After taking into account economic growth, this amount is still \$7,658 more debt per person than we would expect to see, had provincial government debt tracked over time with GDP growth. Note that this amount does not factor in the BC individual's share of the total federal government debt, which is also rising considerably. The next section examines each cohort's ability to pay for taxes vis-à-vis the amount of taxation that goes toward increased investments in retirement and medical care.

					1976			
		Total Taxes Taxes to Medical Care for Age 65+		Medical Age 65+	Taxes to Age	Total \$ to Medical & OAS		
Age 35 income percentile	2016 income	Average Rate	\$ Amount	% of Total Taxes	\$ Amount	% of Total Taxes	\$ Amount	
25 th	\$24,797	9.3%	2,308	5.0%	115	5.4%	125	240
50 th	\$45,570	17.7%	8,088	5.0%	403	5.4%	437	841
75 th	\$71,274	23.3%	16,572	5.0%	827	5.4%	896	1,723
99 th	\$203,506	38.3%	78,043	5.0%	3,893	5.4%	4,221	8,114

4.3.3 Wolfson's Golden Rule: Taxes Paid in BC by Young Adults, 1976 vs. 2016

		Total Taxes		Taxes to Care for	Medical Age 65+	Taxes to Age	Total \$ to Medical & OAS				
Age 35 income percentile	2016 income	Average Rate	\$ Amount	% of Total Taxes	\$ Amount	% of Total Taxes	\$ Amount				
25 th	\$24,797	8.2%	2,023	9.2%	187	5.8%	118	305			
50 th	\$45,570	14.0%	6,359	9.2%	587	5.8%	370	958			
75 th	\$71,274	18.9%	13,496	9.2%	1,247	5.8%	786	2,032			
99 th	\$203,506	32.9%	66,998	9.2%	6,188	5.8%	3,900	10,088			

2016

		2016 minus 1976							
		Total Taxes	Total \$ to Medical Care & C	e & OAS for Age 65+					
Age 35 income percentile	2016 income	\$ Change	\$ Change	% Change					
25 th	\$24,797	-\$285	\$65	27%					
50 th	\$45,570	-\$1,729	\$117	14%					
75 th	\$71,274	-\$3,076	\$309	18%					
99 th	\$203,506	-\$11,045	\$1,974	24%					

Table 4.7. Taxes Paid in BC by Young Adults, 1976 vs. 2016. Source: Generation Squeeze; Custom Statistics

Canada simulation using Social Policy Simulation Database and Model (SPSD/M) versions 8.1 and 26.1

Table 4.7 illustrates the shift toward lower tax rates in British Columbia, decreasing

between 1-5 percentage points in 2016 compared to 1976. This trend is especially pronounced in

the highest brackets, signaling less progressivity in the income tax code, a reinforcement of the earlier finding that taxes in BC have become less effective at reducing income inequality and redistributing it to those at the bottom end of the income spectrum. Extant budget data also suggest that the province has increasingly relied on property transfer taxes to raise revenue, which, combined with property taxes, comprise 7.5% of all provincial revenue (up from 0.5% in 1976).

The most important finding is that while individual tax contributions are lower now than a generation ago, the overall proportion that citizens contribute to OAS and medical care for those over 65 has increased dramatically, as spending on these items has increased with additional demand. Taxation has thus favoured older adults at this time more than four decades earlier: they pay far less in tax than their parents' generation did at their age (despite a greater ability to pay), and they are the beneficiaries of a disproportionate share of the revenue that exists today. The last section examines another form of public debt that future generations will inherit: environmental debt.



4.3.4 Sustainability: Environmental Debt

Figure 4.16 BC GHG Emissions. Source: BC Stats⁸⁹

British Columbia's emissions record is difficult to measure as far back as 1976; data on greenhouse gas emissions begin in 1990. Regardless, the recent history of absolute GHG emissions peaked in 2004 at 70,801 kilotons of CO_2 equivalent. Since then, absolute emissions have fallen on average, declining to 64,464 ktCO2e in 2014. At a per capita level, however, emissions have steadily fallen from 17.7 tons of CO_2 equivalent in 1990 to 13.9 in 2014.



Figure 4.17 BC GHG Emissions. Source: BC Stats⁸⁹

In spite of these positive trends, recent analysis of the catastrophic effects of climate change and pertinent international climate targets provide some cause for concern. While no data on the ecological footprint per capita (which measures anthropogenic natural resource demand on the biosphere) are available for BC, they do exist at the national level for Canada. Current projections propose that a global environmental average footprint of 1.7 hectares per person is required if each global citizen is to live within the means of our planet's resources.





In 1976, the Canadian ecological footprint per person was 10.1 global hectares. This amount fell to 8.1 global hectares in 2014. While this trend is encouraging, it is still quite a bit short of the 1.7 hectares per person by 2050 goal set out under the Paris Agreement. As Kershaw calculates, Canadians need to reduce our footprint at three times the pace we did between 1976 and 2014 – from an average of -0.06 hectares per year to -0.18 hectares per year.

Our ecological footprint alone also bears further scrutiny in relation to our biocapacity per person – that is, our environmental capacity to regenerate resources. The troubling trend detailed in Figure 4.18 shows that while our ecological footprint may be declining slowly, our biocapacity is declining at a far greater rate, signaling that Canadians are getting closer to consuming natural resources at a rate that is faster than our environment is able to regenerate them (the green area displayed in Figure 4.18). Thus, while some improvements have been made toward improving our climate in BC and Canada broadly, the urgency with which current and future generations must react has worsened, leaving younger British Columbians with a greater source of environmental debt to manage.

Chapter 5: Discussion and Conclusion

The findings of this thesis reveal a decline in many, but not all, important SDOH indicators for many young people living in British Columbia (see *Section 4.2* for some counter-examples) – answering research question 1. At the population level for young British Columbians, earnings are down, market income inequality has worsened, young people face higher costs of living and greater barriers to entering homeownership, and incur higher amounts of personal debt to own housing. Housing reveals a clear point of inequity compared to previous generations, whereby the highest source of personal debt for younger generations – homeownership – is the greatest source of wealth for the older generation.

In response to question 2, some key indicators can be interpreted to imply (at least partially) adaptations to these SDOH deteriorations by younger cohorts at the individual level: for example, increased post-secondary education in response to weaker earnings opportunities; longer tenure in parental homes in response to difficulties to establish independent financial foundations; delayed family formation in response to limited financial security, etc. Simultaneously, governments invested the proceeds of economic growth more into later life course stages than earlier ones, while also reducing personal income tax rates.

I now examine my third research question: did changes in government spending align with the insights and recommendations of the SDOH, HiAP and Intergenerational justice literatures – especially when considered in light of the SDOH changes I examine over the 4 decades? In doing so, I employ three theoretical literatures to help interrogate and analyze both these changes and our collective response to them: first, the SDOH literature that drives us to target social spending earlier in the life course; second, the health in all policies literature that impels us to invest in policies that improve SDOH across the population; and third, the literature

on intergenerational justice that motivates our alternative policy imaginary, while questioning the ethical fairness of current policy arrangements.

Despite the wealth of literature on life course and SDOH, governments have chosen to prioritize policies geared toward those later in their lifespan. The majority of new public investment has gone to those over age 65, even though that group enjoys greater ability to pay than age cohorts immediately before and after it. This directly undermines *Wolfson's rule*, and the public policy response shows that BC and the federal government have not adequately *budgeted for all ages*. Through examining aggregate and per capita government policy investments, it is clear that the federal and provincial governments both prioritize spending for the aging population – through medical care spending at the provincial level, or retirement security at the federal level. These have increased by nearly \$5 billion for OAS at the federal level, and by an additional \$4.3 billion on medical care at the provincial level. While these spending increases could be motivated by demographic shifts, with the 65+ population in BC increasing by over 8 percentage points of the total population (or 604,729 people) in the last 40 years, similar absolute increases to the younger population (by 771,608 more people under 45) did not motivate commensurate aggregate spending increases on younger British Columbians.

Instead, younger adults in BC have experienced a sizeable disinvestment in public education, from elementary to postsecondary. While elementary funding has declined in reasonable proportion with the decrease in the 5-17 population, (which fell from 27.5% of the population in 1976 to 14.8% in 2016)⁶⁶ postsecondary funding has fallen short of demographic growth and demand. With the additional demand placed on postsecondary institutions, additional funding has primarily come from tuition fees, driving up student debt. Simultaneously, the amount the province spends on postsecondary has fallen by \$816 per person in 2016 compared to

1976, after adjusting for inflation, economic growth, and increased demand for postsecondary. Childcare investments have not kept adequate pace with demand for a quality, accessible, universal program. Generation Squeeze estimates that a \$10 a day child care program in BC would require \$1.5 billion in additional public funding, or \$586 per person under 45 (\$491 more than the current \$91 per person in spending).^{111,112} These findings are troubling given the literature on life course and SDOH that encourage us to invest earlier in the life course. Targeting new expenditures toward child care, parental leave, and education is likely to yield benefits that last throughout the lifespan of the cohorts that benefit from that spending. Furthermore, an increased prioritization of younger generations' SDOH would help manifest the vision of a *society for all ages*.

A health in all policies approach encourages us to invest in the non-medical determinants of health, and question the degree to which BC prioritizes medical care spending on both the elderly and the young. The current cohort of young adults potentially faces multiple intersecting disadvantages: their poor historical timing in the labour market and housing market, and inheriting public spending that is set to increase on both retirement spending and medical care as the share of working-age citizens (on which government primarily relies for general revenue and economic growth) shrinks relative to the share of retirees. It is therefore worth unpacking the question of whether these spending trends – especially health care spending – are inevitable as a function of population aging, and then considering what a HiAP perspective might encourage us to do differently.

Health care spending has been rising faster than other forms of spending (with the exception of retirement income), driven in large part by physician remuneration tied to both clinical and policy choices about the type of treatment provided to seniors versus other

demographic groups, rather than by evidence or population health outcomes. Most estimates reveal that population aging alone is only a modest driver of increasing health care costs, estimated at 1% per year.¹¹³ This figure has been reproduced across multiple Canadian studies between 1978 and 2011.^{113–118} This is primarily credited to the slow rate at which entire populations age, making the issue more analogous to a "glacier" than an "avalanche" – slow growing, but the costs add up over time.¹¹³

It is well established that physician spending comprises the third highest overall cost to the health care system, behind hospital and drug expenditures.¹¹⁹ Physician spending is also among the fastest-growing health costs across the country, increasing at an annual rate of 6.8% per year from 1998 to 2008.¹¹⁹ Prior literature on age-related physician costs in British Columbia has typically explored tends over the prior decade, examining the effect of age cohort on various types and intensity of physician care. Most analyses found that age-strata-specific costs (e.g. the costs for those aged 65-69) have not increased in proportion to the number of people within those age strata. While the number of people over 65 is growing as a group, they are consuming a qualitatively different set of health services than the previous cohort of 65+ adults, with meaningful impacts on care costs. This general trend has held across multiple decades, from the 1980s to the mid-2000s.

An early analysis performed by Barer et al. examined change in physician fee-for-service (FFS) use in British Columbia between 1974-75 and 1985-86. They found that the rate at which those over 74 increased their share of overall physician spending outpaced their actual growth rate (50% increase in cost vs. 18% growth in population cohort).¹¹⁵

A subsequent analysis from 1985 to 1996 found that changes in the population age structure accounted for a mere 0.4% increase in costs.¹¹⁶ The most striking findings concerned

the change in how different types of physician (specialists vs. family doctors) were utilized among older age groups. Per-capita use of family doctors fell for seniors, measured by both patient contacts and number of services provided per contact.¹¹⁶ Specialist use, however, rose by 31% overall, with seniors accounting for double the rate of increase in specialist physician costs.¹¹⁶

The following decade (between 1996 and 2006) saw a continuation of this trend within BC. Inflation-adjusted expenditures per capita on FFS medical care did not increase between 1996 and 2006, as the increased care provided to seniors was offset by a decrease in care provided to non-seniors.¹¹⁸ However, costs increased dramatically for diagnostic services during this period (both laboratory testing and diagnostic imaging) across all age groups, but especially among the elderly and the very elderly.¹²⁰

These findings demonstrate that care is skewed in a way that may not be commensurate with population health needs. McGrail et al. describe this ongoing trend as a "'twist' in utilization patterns, resulting in more care for the elderly and less for the young."¹²⁰ These changing patterns of care, they suggest, might contribute to the public perception of scarcity within the health care system. The past 30 years of age-adjusted health expenditure data seem to support their observation, which suggests that care utilization patterns are not shifting in response to demographic need, but instead to deliberate policy choices to provide more of certain types of care for a small subset of the population.

Furthermore, per capita spending on medical care under 45 also grew faster than economic growth between 1976 and 2016 (by an additional \$1,488), whereas all other social policy spending for young adults in BC fell by \$1,215 per capita below economic growth. This undermines the lessons of health in all policies, which warns us against prioritizing medical care

spending if our goal is to improve population health. Given that social spending is correlated with improvements in life expectancy and preventable mortality more so than medical spending (a 1% increase in social spending per dollar spent on health in Canada is associated with a 0.1% decrease in potentially avoidable mortality and a 0.01% increase in life expectancy), the political decision to prioritize additional funding for medical care is interpretable as a choice to not invest in social programs that positively impact population health, particularly for younger British Columbians.³⁸ A HiAP approach therefore encourages us to scrutinize the extent to which health care priority setting is motivated by political ends over evidence and outcomes, and potentially reallocate medical care spending toward other social needs such as child care, parental leave, and education. In this way, HiAP reframes the dominant conversation around social spending as being somehow distinct from health spending; highlighting instead that social spending serves the ends of improved population health outcomes through improving SDOH.

Lastly, the literature on intergenerational justice helps us interrogate the ethical fairness of current policy arrangements, and incites discussion around an alternative policy imaginary as a means of correcting the current sources of intergenerational inequality in BC. There is evidence of deterioration in some major social determinants of health of younger British Columbian adults – especially as they enter their prime earning years. This finding, combined with the fact that the older generation pays less in tax now than their parents' generation did at their age, and they continue to benefit from a disproportionate share of the revenue that exists today, directs us toward several policy options. For one, there may be grounds from a health equity and fairness perspective to argue for lowering the burden of revenue collection against younger adults and/or reallocation of existing spending to prioritize policy levers that shape the SDOH for younger generations. This option could resemble the age tax credit currently offered to older adults, but

instead aimed at younger adults, and in particular, young adults starting families. Such a policy would be motivated by the demands of intergenerational justice, by helping create a *society for all ages*. In lieu of tax credits, revenue could be generated from terminating the approximately \$3 billion per year subsidy geared toward older adults via the Age credit, given their historically unprecedented wealth acquisition and ability to pay. Such a move to reallocate public finances from an older demographic to a younger one is motivated by intergenerational fairness; this is defensible given that the current cohort of young BC adults face lower earnings than a generation ago, and their asset composition is fundamentally different than that of the previous generation, with far fewer young adults likely to own their home and build retirement security through homeownership. It will also be necessary to find policy successes in other jurisdictions that have strengthened the SDOH for younger adults through improved parental leave policies, potential de-commodification of essential goods, and expansion of income supports and worker retraining programs.¹²¹

Such a move would be a reversal of the current trend in BC and across Canada toward allocating most new government spending on retirement and medical care, which primarily benefit older adults, and might demand progressive and novel forms of taxation as means to tackle key drivers of inequality between generations, such as taxing housing wealth.¹²² If done appropriately, it should be possible to simultaneously increase or maintain current investments in well-established programs like medical care and retirement security, while also expanding much-needed investments in education, child care, and parental leave. Alternatively, BC could reallocate resources away from medical care, and toward upstream determinants of health such as a functioning, accessible public transit to reduce commute times, or a \$10/day child care program to alleviate the cost burden on young families. These investments in younger

generations could resemble the policies adopted in Nordic countries like Norway and Sweden, in keeping with the "Nordic Welfare" model described by Esping-Andersen.⁶² These policy choices would concurrently be motivated by the explicit lessons of a HiAP approach, and the ethical demands of intergenerational justice.

The status quo arrangement of public spending may yet prove *unsustainable* over the next several generations. We cannot always count on the economy staying as productive as it has in the past. Current trends suggest that "hard work isn't paying off like it used to," but we can learn from previous adaptations made by governments in response to similar crises in social conditions. When seniors' poverty reached critical levels in the 1960s, Canadians responded with historic investments in income and retirement security for older adults. In 1976, the after-tax LICO (the share of residents who spend 20% more on food, shelter and clothing than an average size-adjusted family) sat at 29% for seniors over 65. By 2016, this rate had fallen to 4.7%. This drastic reduction in elderly poverty came about not by chance, but as a result of concerted policy choices to improve seniors' retirement security through the Guaranteed Income Supplement, Old Age Security, the Canadian/Quebec Pension Plans, along with our public medical care system.²¹ Thus, we are presented with an opportunity in BC to invest in a set of public policies that improves the SDOH for younger adults. It is also apparent that these adaptations need to be done in a way that is both fiscally and environmentally sustainable, given the ever-decreasing time until climate change goals must be met to avoid dire ecological consequences. These sustainability-oriented actions ought to be taken both as a matter of duty to future generations and as a form of generational stewardship.

This thesis examined intergenerational changes in the SDOH between 1976 and 2016, and the individual and public policy adaptations that corresponded with them. My findings

suggest that more recent generations have lost the *lottery of timing*, and face several worse social and economic conditions compared to a generation ago. My findings further propose that the conditions younger adults in BC face are largely modifiable through a concerted public policy response, yet the contemporaneous public policy response in British Columbia has not adequately upheld the notion of a *society for all ages*. My findings also imply that *sustainability* is an increasingly difficult standard for both public finance and environmental debt, as the world that older adults in BC have left their children is not at least as good as the one they in their turn had inherited – and less time remains to rectify the situation before the situation will no longer be remediable by human efforts. Lastly, this project found that *Wolfson's rule* has been absent from public expenditure and revenue collection in British Columbia, and argues that there needs to be a re-balancing of priorities to account for the current imbalance in revenue generation and spending between generations.

5.1 Limitations

There remain some limitations to this project's analytical approach. First, there may exist sources of data for which years prior to the 1980s or 1990s are unavailable, making intergenerational comparisons for the entire period of analysis impossible. In these cases, I attempt to highlight general direction and strength of trends for the period of available data, and, where possible, to use point in time data to provide a picture of what occurred for the generation that came of age in the 1970s.

There are some variables for which no data are available, such as the intergenerational transfer of wealth through inheritance, or the phenomenon of familial support to invest in assets like homeownership. These phenomena largely contribute to intra-generational inequality (i.e., within-cohort inequality, such as familial support in affording a down payment on a home),

which is outside the scope of this analysis, but quite important to understanding the broader trend of intergenerational inequality. Moreover, the analysis presented here almost entirely consists of intergenerational comparisons (compared with intra-generational ones); data limitations preclude the ability to draw conclusions about what is happening *within* generational cohorts with respect to inequality in health and social outcomes. I also lacked sufficient data on additional adaptations being made by younger people in response to declining SDOH, such as the amount of younger people who are coupling up or living with roommates in response to increasing rents.

There are inherent limitations with regard to the generalizability of the findings in this project. Some populations not covered within the surveys used to acquire population-level data, such as institutionalized persons, and those living on First Nations reserves. These are further discussed in the section on *Data Sources*. The data presented are primarily focused on British Columbia, and (with some exceptions) cannot offer a reflection of broader trends occurring in other provinces or at the national level over this period.

The observational nature of the analysis presented in this thesis limit the ability to draw causal conclusions, or to pick apart effects below the population or selected group levels of analysis. Further study could seek the individual-level relationship between educational attainment and earnings, housing tenure, and personal debt over time, in order to more deeply explore the connections toward which my initial results draw our attention.

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Appendices

Appendix A Original Measures in the Quebec Intergenerational Equity Index

<i>Living Standards and Young People (25- 34):</i>	Sharing of power, wealth, and employment opportunities
 Median income after tax, 25 to 34 Unemployment rate, 25 to 34 Average length of unemployment spells (in weeks), 25 and 34 	 Ratio of median income after tax, 25 to 34 years and the median after-tax income, 16+ Ratio of the unemployment rate for 25 to
4. Average number of hours worked, 25 to 34 years +	34 years and the unemployment rate, 15+3. Ratio of median net assets of 25 to 34
 Pay equity: Weekly salary of women aged 25 to 34 / weekly salary of men aged 25 to 34 	years and the median net assets, 16+4. Ratio of average tax rate, 25 to 34 and the average tax rate, 16 years and over
6. Income inequality: Gini coefficient, 25 and 34	(average before tax - average after-tax income / average before tax income)
 Median net assets, 25 and 34 Ratio of average house prices and 	5. Gross and/or Net debt of the provincial government as a percentage of GDP
median income after tax, 25 to 34	 Percentage of GDP up to provincial
 Ratio of average rent for a 2 bedroom and the median after-tax monthly, 25 to 34 	education spending7. Percentage of GDP going to the provincial health spending
10. Crime rate per 100 000 population (excluding traffic violations)	8. Percentage of GDP going to provincial spending on childcare
11. High school graduation rate, 25 to 34	9. Retirement Income Spending
 12. University graduation rate, 25 to 34 13. Life expectancy at birth 	10. Percentage of GDP going to provincial spending on debt service
14. Stock of provincial public infrastructure	11. Average age of MNAs after each election
15. Overall Satisfaction with regard to life	companies
In the 25 to 34 years 16. Rates of major depression in the past	13. Emissions of greenhouse gas (megatonnes of CO2 equivalent)
year and perception of mental health for 25 to 34	14. Concentration of fine particles in southern Quebec and southern Ontario
	15. Water quality at the mouth of the main southern watersheds (Quebec only)

 Table 5.1 Original Measures in the Quebec Intergenerational Equity Index. Source: Gagné et al. 201675

Appendix B Full List of Results

B.1 Median Full-Time, Full Year Income, 25-34

A significant finding concerns the decline in inflation-adjusted wages for young British Columbians over the study period. Here employment income "consists of wages and salaries, commissions, net-income from unincorporated non-farm and or professional practice and net farm self-employment income."¹²³ Note that this is "adjusting" for the amount of time spent in the labour market – looks only at full-time, full-year workers. In a sense, this measure answers the question, "what are young people getting in exchange for their time in the labour market?"

One can observe a significant decline in inflation-adjusted income from 1976-2016, with the difference between the two years being \$8,717. There is a notable flatlining of wages in the late 1980s, with the average of the period from 1985-2014 at \$46,673. This decline does not include or reflect the degree of precariousness, or security in the job market itself. Income as a SDOH is contingent on the purchasing power of said income; this decline is also notwithstanding potential increases in cost of living over this period that will be explored in this project. How does knowledge mobilization and political advocacy campaign Generation Squeeze characterize this phenomenon? In their KT campaign, they argue, "hard work just doesn't pay off the way it used to."⁹⁰





Figure 5.1 BC Average Unemployment Rate, 25-34. Source: CANSIM Table 282-0002¹⁰¹

Both the generation that came of age in the 1970s as well as the current generation that came of age within the mid-2000s and 2010s entered the labour market during a period of relatively low unemployment. This is in stark contrast to young workers who entered the workforce during the 1980s, and to a lesser extent, the early 1990s, where the unemployment rate for 25-34 year olds peaked at 13.16% and 9.7%, respectively.

It is well established that young workers who graduate and seek employment during periods of high unemployment face lower initial wages when compared to individuals who graduate when the job market is strong. This disadvantage tends to persist well into their working lives, as they are more likely than better-off cohorts to accept less favourable and lower skill jobs with poor wages and with limited opportunities for training and career advancement.¹²⁴ The high youth unemployment rate in the 1980s could have lingering impacts on the overall lifetime

earnings of that cohort, and the cumulative stress and mental health implications from these consequences could affect later their health trajectories vis-à-vis a life course approach.^{125–127}

However, the unemployment rate should not be interpreted as a sign of the health of the economy. It may be the case that unemployment is at historic lows for British Columbian youth, but the quality of their employment shows some signs of decline.



B.3 Average Weeks Unemployed, 25-44

Figure 5.2 Average Number of Weeks Unemployed. Source: CANSIM Table 282-0048¹²⁸

Generally, we observe a longer average period of unemployment for older adults than for younger workers. The length of unemployment tends to increase in recession, as it did in the mid-1980s (with a peak for young workers of 26.2 average weeks unemployed in 1985) and again in the 2008-2012 period. This finding reiterates the earlier point regarding significant

negative labour market conditions for the generation entering the labour market in the mid-1980s.

It appears that the length spent in unemployment is quite high in BC for all workers, with the unemployed spending an average of four months looking for work from 1976-2016. This is especially concerning given that polling data from 2016 suggest that over half of all BC workers report "it would be difficult to meet their financial obligations if their pay cheque was delayed by even a single week," and nearly a third could not produce \$2000 if an emergency arose.^{129,130} The stress incurred by such economic uncertainty is well understood as a social determinant of health.



B.4 Self Employment Rate, All Ages

Figure 5.3 Self-Employment Rate, All Ages. Source: CANSIM Table 282-0012¹³¹

Self-employment is defined and operationalized by Statistics Canada as "individuals operating a business for their own profit, as opposed to those who work for 'others' (paid

employees)."¹³² Unfortunately, the rate of self-employment is not available by age group in public data, so it is presented here for all British Columbians in the labour market.

Self-employment is not an undesirable employment status unto itself; self-employed workers generally have a higher net worth than paid employees, but their wealth is often used as a buffer for a lack of structured benefits such as extended health insurance and pensions.¹³³ However, self-employment does tend to rise during recessions – as a general tendency, possibly due to the lack of opportunities for paid employment.

Over the study period the rate of self-employment rose for the entire workforce by over 5% (5.7%, from 12% to 17.7%), which is a modest increase in itself but novel given that the national rate of self-employment overall is in decline.¹³⁴



B.5 Rate of Temporary Employment

Figure 5.4 Temporary Employment, 25-44, 1997-2016. Source: CANSIM Table 282-0080¹³⁵



Figure 5.5 Temporary Employment by Type, 25-44, 1997-2016. Source: CANSIM Table 282-0080¹³⁵

The rate of temporary employment is one direct measure of the degree of precariousness in the labour market. A temporary job has a predetermined end date, or will end as soon as a project is completed. There are a few different forms of precarious work: part-time employment; temporary employment, including term or contract, seasonal, casual, temporary agency, and all other jobs with a specific pre-determined end date; own-account self-employment (a selfemployed person with no paid employees); and multiple jobholding (two or more concurrent jobs).¹³⁶ It is difficult to capture employment permanence with the official statistics, as "a permanent job in an unstable sector also creates precarious employment."¹³⁷ Temporary employment is an important metric but raises a challenge of comparison between generational cohorts, as there is no way to directly measure it prior to 1990.

It is clear is that the rate of temporary work is increasing for young workers, especially in response to the recent recession. We do know that in the early 1990s, non-standard work grew

considerably across Canada.¹³⁶ Furthermore, the rate of temporary job growth in BC is increasing relative to permanent jobs, which is a worrying trend.¹³⁸



B.6 Rate of Part-Time Employment, 25-34

Figure 5.6 Proportion of Full-Time and Part-Time Employment. Source: CANSIM Table 282-0002¹⁰¹

The rate of part-time employment over the study period appears to have gradually increased over time for the young British Columbian workforce. There was an increase in the rate of part-time employment from roughly 10% of the workforce to 15% from 1976 to 1996, at which point it has remained above or near the average for the total period of 14%. This increased share of economic activity suggests a decline in opportunities for full-time, salaried employment, and the array of protections and benefits that such positions generally confer.



B.7 Average Tenure at Job by Type of Work, 1976-2016

Figure 5.7 Average Tenure at Job by Type of Work (Months), 1976-2016. Source: CANSIM Table 282-0038¹³⁹

This is a rather significant finding: the length of time spent in part-time work is rising dramatically. No longer is part-time work a temporary phase of casual or flexible labour participation but instead it has become the long-term arrangement for a greater proportion of part-time workers, despite this form of employment being much less likely to carry benefits or security, and more likely to be lower pay.



Figure 5.8 Average Actual Hours Worked, 25-44, 1976-2016. Source: CANSIM Table 282-0018¹⁴⁰

There appears to be no significant change over the study period. As expected, women generally work fewer hours as a result of being more likely to be in part-time work. One dominant explanation for this pattern is that women are generally more likely to balance their labour market opportunities with the concomitant expectation of additional domestic labour.¹⁴¹ Commitment to the labour market appears to be consistent across the period, yet the earnings for said work have declined over time.



B.9 FTFY Median Income of Men 24-35 vs. Women 24-35, 1976-2014

Figure 5.9 FTFY Median Income of Men 24-35 vs. Women 24-35, 1976-2014. Source: Canadian Income Survey

Over the period, median pay equity seems to have improved, although not for terribly laudable reasons: the stagnation of men's wages has led to a convergence with women's wages over time. Of course, considerable gender pay equity remains in particular fields of employment; this is only representing the ratio of median earners who are working full time, full year jobs.



B.10 Median and Average Total Debts and Assets, 35-44

Figure 5.10 Median Debts and Assets by Age Group, Economic Families and Unattached Individuals, 1999-

2016. Source: CANSIM Table 205-0002⁸⁵



Figure 5.11 Median Assets Minus Median Debts (Net Worth) by Age Group, Economic Families and Unattached Individuals, 1999-2016. Source: CANSIM Table 205-0002⁸⁵

Wealth data in Canada are both difficult to obtain and rarely measured. With that challenge in mind, the available data through the SFS allows us a glimpse into total debt and wealth for various age groups across the BC population starting in the year 1999. Assets here include bonds, deposits in banks, retirement savings accounts (employer-sponsored and private pensions, registered retirement savings plans (RRSPs), etc.), vehicles, stocks, investments, real estate, and equity in businesses. Debts include credit card debt, lines of credit, mortgages, student and vehicle loans. The net worth for young British Columbians is shockingly low across 1999-2016, with over 50% being indebted and with negative net worth. In contrast, the "median individual" representing the group aged 55-64 saw their wealth nearly double over this period, from \$515,700 to \$992,500 (an increase of \$476,800).

Much of the data in the SCF reveal that the primary form of wealth is largely attributable to real estate; hence more available data on housing wealth are explored in the next section separately. These data are more complete and allow comparisons to be made between the generation that came of age in 1976 and the current generation.



Figure 5.12 Inflation-Adjusted Hourly Minimum Wage in BC, 1976-2016. Source: Government of Canada Minimum Wage Database¹⁴²

The hourly minimum wage is worth exploring to see how workers at the bottom end of the earnings distribution manage over time. While the proportion of workers earning the minimum wage at any time is usually relatively small (roughly 5% of the BC workforce in 2015), it is a good barometer of labour market conditions for a much larger group of workers who make just above the minimum wage. In 2015, almost 25% of all workers in Canada made below \$15 an hour.¹⁴³

There are two periods in which inflation paired with a freezing or slow rate of increase to the legislated minimum hourly wage in BC caused severe income stagnation for those earning the minimum wage.¹⁴⁴ We can observe this trend in the oft-pointed to minimum wage freeze from 2002-2010, where the hourly wage lost \$1.68 in inflation-adjusted dollars over the period (falling from \$10.50 in 2001 to \$8.82 in 2010). The hourly wage is often presented in relation to

the poverty line – as a measure of relative inequality for low wage earners. This measure is discussed below.



B.12 BC Annual Minimum Wage as Percentage of Low Income Measure (LIM)

Figure 5.13 BC Annual Minimum Wage as Percentage of LIM. Source: CANSIM Table 206-0091, Government of Canada Minimum Wage Database^{142,145}

Unlike the Low income cut-offs, low income measures (LIMs), are relative measures of low income, set at 50% of median household income, adjusted for household size. Here I present the LIM for a single adult individual relative to the minimum wage to help demonstrate that the minimum wage has not been sufficient to keep people out of poverty in BC for most of the period observed throughout this study. The dashed line at 100% reflects the cut-off (i.e., poverty line) for a single adult individual – thus, only in the late 1970s and briefly in the mid-1990s were minimum wages sufficient to lift people above the poverty line.



B.13 Working Age vs. Senior Poverty (LICO) in BC, 1976-2015

Figure 5.14 Working Age vs. Senior Poverty (LICO) in BC, 1976-2015. Source: CANSIM Table 206-0041¹⁴⁶

The rate of low income for seniors in Canada has dramatically fallen since the 1970s. This is largely a reflection of the policy response to the unacceptably high level of poverty among older adults prior to the implementation of the Guaranteed Income Supplement (GIS) in 1967, and the expansion of the Old Age Security (OAS) pension program, especially as it became indexed to the inflation rate in 1985. On the other hand, no major policy innovations have targeted working-age poverty rates across the study period, and BC is notorious for being the last province in Canada to enact any form of poverty reduction strategy. BC boasts one of the highest poverty rates across Canada, and shamefully froze welfare assistance rates between 2007 and 2017, with social assistance cheques losing their value to inflation over this period.¹⁴⁷



B.14 Unionization Rate by Age Group, 1997-2017

Figure 5.15 Unionization Rate by Age Group in BC, 1997-2017. Source: CANSIM Table 282-0220¹⁴⁸

It is widely acknowledged that the rate of unionization has been falling across Canada since the early 1980s,¹⁴⁹ and BC is no exception to this trend. While the LFS only began collecting data on unionization in 1997, data from the 1981 Survey of Work History reveal that the unionization rate for all workers in BC was 43.3% in 1981, and fell a total of 15% to 28.3% by 2017.¹⁵⁰

When these trends are further examined by age group, an interesting pattern emerges – there has been a marked decline in unionization among older adults in the last twenty years. The trend is present in younger adults although to a lesser degree, with unionized workers 25-34 losing almost 6% and unionized workers aged 35-44 falling 3.5% over that period. Factors such

as the decline in union membership and/or coverage under a collective agreement contribute to the observed stagnation of inflation-adjusted wages from 1976 to the present.



B.15 Income Inequality (Gini) in British Columbia, 1976-2016

Figure 5.16 BC Gini Coefficient (Income Inequality), 1976-2016. Source: CANSIM Table 206-0033⁹¹

The extent of income inequality in BC as captured by the Gini coefficient has fluctuated over time, and overall has trended toward a gradual increase (the market income Gini moved from 0.369 to 0.4, peaking at 0.454 in 2002). This reflects a general increase in income inequality over the study period. However, the Gini coefficient is a rather blunt reflection of different income distributions, and its increase may reflect underlying demographic changes such as an aging population. More interesting, however, is the difference between the market income Gini and the after-tax income Gini as a reflection of the effectiveness of the taxation system's ability to redistribute income.



Figure 5.17 Difference Between Market Income Gini and After-Tax Gini, 1976-2016. Source: CANSIM Table 206-0033⁹¹

One can observe a marked increase in the gap between the market income and after-tax Gini coefficients, reflecting a potential improvement in the tax system's ability to redistribute income across BC's population more effectively and equitably over time.



B.16 Ratio of One Bedroom Rent to Monthly Income

Figure 5.18 Average and Median 1 Bedroom Rent in BC, 1990-2017. Source: CMHC Rental Market Survey⁹³

Before examining the intergenerational divide in homeownership and housing wealth, one must focus on the rental market. According to the 2016 Census, over 42% of households in the Greater Vancouver Region were renters, and in 2011 the National Household Survey estimated that just over half of all households in the City of Vancouver were renters.^{94,95} While the CMHC data only permit us to examine purpose-built rental market data beginning in 1990 onward, it still reveals an interesting trend across the province – that average and median rents have climbed from the mid-\$800s in 2005 to over \$1000 a month in 2017. These figures are even more pronounced for Vancouver and Victoria, but this analysis is focused on province-wide trends. Overall, this sudden rise is concerning, but how has the rise in prices tracked the change in income over that period?



Figure 5.19 Ratio of Average and Median 1 Bedroom Rent / Median Monthly Income. Source: CMHC Rental Market Survey⁹³, Canadian Income Survey

Here one can observe that the ratio of rents to FTFY incomes have not increased as substantially as rents have over the period 1990-2014 (the calculations stop at 2014 as that is the latest year for which FTFY income data are available). The variability displayed in the last 10 years of data is largely a reflection in the variability of the FTFY income over that period. Given that these median figures are not representative of how those at the bottom of the earnings distribution are faring with respect to shelter cost, how does this average rent track to the inflation-adjusted minimum wage over time?



Figure 5.20 Ratio of Average and Median 1 Bedroom Rent / Monthly Minimum Wage. Source: CMHC Rental Market Survey⁹³, Government of Canada Minimum Wage Database¹⁴²

As with the earlier findings on minimum wage, the noticeable "dips" in the percentage of monthly income going towards rent are primarily a reflection of policy-initiated increases to the minimum wage, and the slow rise a reflection of the stagnation of the minimum wage over that period. Regardless, one can expect to pay between 60 and 80 percent of their monthly income on rent if they are living as an individual on the minimum wage. This is largely untenable for most individuals earning low incomes, and thus they are more likely to be living with a partner or non-related roommate(s) to cover both their shelter costs and other vital costs of living like food and transportation.



Figure 5.21 Greater Vancouver Region Average Monthly Gross Rent and Average Monthly Homeowner Payments. Source: Canadian Census

Data from the long form of the census permit a slightly earlier perspective into the story of monthly costs of housing in BC. Unfortunately, the available census data do not easily enable the calculation of province-wide averages, thus the Greater Vancouver Region was selected as a Census Division of interest to explore trends in the costliest area of the province over time. While the CMHC data point to a recent uptick in the cost of purpose-built rental accommodation in British Columbia, census data suggest that average monthly rental costs have remained more or less constant within BC over the period from 1981-2016. Conversely, the average monthly cost of homeownership appears to have risen from around \$1200 in 1981 to over \$1600 in 2016. The data on the cost of renting suggest while average rents may be increasing, these changes are still below what the CMHC terms "core housing need" for those earning the median income – i.e., when households allocate over 30% of their before-tax income towards the cost of shelter.¹⁵¹

While these figures illustrate that at a province-wide level, monthly rents in BC have remained relatively stable since the 1970s, rents are climbing at faster rates within BC's largest cities – Vancouver and Victoria – which is where a significant proportion of job growth is concentrated.¹⁵² So with these trends in mind, we now turn our attention to the cost of homeownership in British Columbia over time.



B.17 Average Cost of Housing

Figure 5.22 Average Housing Price in BC, 1976-2016. Source: Canadian Real Estate Association Data

One of the most significant findings across the study period is the drastic rise in housing prices – especially over the period from 2000-2016, where the average housing price jumped from nearly \$300,000 to almost \$700,000. This figure is a conservative estimate, as it includes all housing in British Columbia. The average housing price has risen even more dramatically in the Greater Vancouver Region and in the Capital Region over this period.

While housing prices increased briefly in the early 1980s, they corrected enough for many people to enter into the ownership market through the remainder of the 1980s and early

1990s. The most telling metric to translate the impact of the housing prices trend is to relate it to the number of years required to save for a down payment – the major hurdle for many young adults in order to bridge the gap between renting and owning.





Figure 5.23 Number of Years to Save for a 20% Down Payment in BC. Source: Canadian Real Estate Association Data; Author's Calculations

My calculations follow the methodology of Kershaw⁹⁶ which assumes that the typical (i.e., median income quintile) young individual can save 15% of their yearly earnings toward the initial 20% down payment on a home. This analysis is quite conservative in reflecting the nature of young adults' ability to save - recent polling data suggest that 35% of Canadian Millennials aged 18 to 34 have no emergency savings at all, while another 10 per cent have less than a month's earnings in case of job loss.⁹⁷ Regardless, at these rates of saving, the "typical" young adult in 1976 required just shy of five years in order to afford entry into the housing market. In 2016, this number had skyrocketed to eighteen and a half years. This highlights just how out of

reach homeownership has become for many young British Columbian adults. Now we examine how these findings have played out with regard to the homeownership rate, and the wealth accrued from homeownership for young adults compared to the older generation.



B.19 Rate of Homeownership by Age Group



The findings above reflect the reality for most young British Columbians: homeownership is out of reach, especially in large cities where many jobs are concentrated. In the mid-1970s, nearly 40% of young adults under the age of 35 owned their home. In 2016, this number had fallen to only a quarter. But how has this trend played out for the quarter of current young adults who are buying into the ownership market? Below we examine these trends.







This chart is best understood as reflecting what is commonly termed "equity," or net wealth. One can observe that for those young individuals who owned their homes in the mid-1970s, after factoring out their mortgage costs, they had accrued nearly \$100,000 of value. In 2016, this amount had increased to just over \$372,000 for young adults, and just over \$653,000 for those 65 and older. On first glance, this seems to suggest that for those who have gotten into the ownership market, the returns have been equally shared across age cohorts – or at least the age differences have not significantly magnified over time. This analysis, however, is limited by a crude understanding of net value – what sort of additional debt did each group have to take on to attain this equity? The next section examines this question in more depth.



B.21 Mortgage Debt by Age Group, 1977-2016



This chart helps place the previous two sections in a more appropriate context. Among the small number of young adults who are currently entering the housing market, they are still gaining more equity (in the process, leaving behind three quarters of their peers who are renters), yet the amount of debt younger adults have to take on now vastly outpaces the amount of mortgage debt that was required a generation ago. Thus access to stable, secure, and affordable housing required less debt and time in the labour market for the cohort that came of age in the mid 1970s.^{90,96,98,99} The chart below highlights the sizeable discrepancy between the amounts of debt taken on to get into the housing market between generations.



Figure 5.27 Change in Debt for Extra \$1 of Net Value, 1977 vs. 2016. Source: Survey of Consumer Finances, Survey of Financial Security, Authors' Calculations

As housing prices have risen across BC, older generations have seen their assets increase to historic levels - the typical British Columbian age 55+ enjoying between \$246,000 to \$305,000 more wealth than in 1977.⁹⁰ Yet for their kids and grandchildren, while they may have \$331,510 more wealth than their counterparts in 1977, they are saddled with an average of \$172,466 more mortgage debt than a generation ago. When we examine the per-dollar amount of debt required for each of these added dollars of additional value from housing, the intergenerational inequality becomes striking across the period of analysis: those under 35 took on an extra \$0.61 in debt for every additional dollar in net worth, compared with only \$0.06 for those over 65. Those who are able to enter into the housing market as a young adult are seeing returns, to be sure, but they are nowhere near as significant as those who got into the market earlier, reflecting the lottery of timing. At the same time, rents are increasing and creating
pressure on those who cannot get into the ownership market. A growing group of young adults under the age of 35 have to work harder and longer to make ends meet as renters for a longer period of their life, and are struggling to save for an initial down payment for a house. As Kershaw notes, "saving a down payment is one factor in home ownership. Managing mortgage payments is another. Even with historically low interest rates, the typical 25-34 year-old must make mortgage payments that are 15% higher now than in 1976-1980, and do so with full-time earnings that are 8% lower. This change requires an extra month of pre-tax median, full-time earnings."¹⁰⁰ With these concerning trends in mind, I now look to potential adaptations that younger adults have made in response to these changes in the standard of living.



B.22 Percentage of Young Adults (20-29) Living in the Parental Home, 1981-2016

Figure 5.28 Percent of Young Adults 20-29 Living in the Parental Home. Source: Canadian Census

While data on the living arrangements of young adults aged 20-29 are somewhat sparse, there is a notable uptick in young people living at home between 1981 and 2001. This trend is most prominent in major urban centres, where affordability concerns have increased the rate at which youth are "delaying adulthood" as an adaptation to declining economic conditions. A recent Vancity report highlighted this trend, with even greater numbers of young people living in the parental home in Metro Vancouver, at a staggering 61% in 2016.¹⁰³ A deeper picture of this trend is possible through family composition data from the Canadian Census, which is presented below.



B.23 Age Distribution of Children Living at Home, 1981-2011

Figure 5.29 Age Distribution of Children Living at Home. Source: Canadian Census

The chart above reflects the greater share of families that report having an adult child aged 25 or older living in their primary residence. Of note is the almost four-fold increase (by 8.5 percentage points) in the number of households with a child over the age of 25. This is captured by the census as a "percentage of families with never-married sons and daughters at home." The figures sum to a total greater than 100%, as each category reflects the percentage of families that have at least one child living in their home within that age range. For example, in 2001, 9% of all households in BC had a child at home over the age of 25. This trend suggests an increase in multigenerational household forms. This trend may reveal positive implications for social inclusion and cohesion, including the diffusion of norms regarding multigenerational homes among some minority ethnocultural groups to the broader Canadian population. Interestingly, *Figure 5.30* also displays a marked reduction in the number of families across BC with young children (less than 6 years and 6-14 years old, respectively), especially between 1991-2011 – a signal that many households are delaying the age at which they are having children.

The increase in multigenerational households could be perceived as an adaptation to falling wages and rising rents, leading to a "delaying of adulthood." This trend is most prominent in major urban centres, where affordability concerns have increased the rate at which youth are "delaying adulthood" as an adaptation to declining economic conditions. A recent Vancity report highlighted this trend, with even greater numbers of young people living in the parental home in Metro Vancouver, at a staggering 61% in 2016.¹⁰³

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B.24 Mean Age of Mother at Time of Delivery, 1989-2016

Figure 5.30 Mean Age of Mother at Time of Delivery (Live Births). Source: CANSIM Table 102-4504.¹⁵³

While data on age at first parity are difficult to obtain within BC across the study period, the mean age at which mothers are delivering children is clearly rising over the past 25 years. In order to understand these patterns better, it is necessary to break these trends down further by age-specific fertility rates, as seen below.



B.25 Age-Specific Fertility Rates, 1989-2015

Figure 5.31 Age-Specific Fertility Rates in BC, 1989-2015. Source: BC Stats⁸⁹

When fertility rates are further examined by age group, there is a clear trend over the past 30-some years toward a decline in the fertility of women between the ages of 20 and 29, and a marked increase in fertility in women aged 30-39. Unfortunately data on age-specific fertility in BC prior to 1989 are not available at this point, although the trend across just this limited period is striking. We have no reason to believe that it reversed prior to this period – based on national data regarding the age at mothers at first birth, there has been a general trend toward the delaying of childbirth in this country that has occurred at least as far back as 1965.¹⁰² Young families are having children later, which suggests that women and families may be exercising a greater degree of control and freedom over decisions related to family planning, especially vis-à-vis their career.

While reproductive technology has improved over this period, it alone is not a sufficient explanation for the drastic shift in the dynamics of age-related fertility in British Columbia over this period. However, this trend still highlights that we have entered an historical period wherein the reproductive age is rising beyond that which is suitable biologically for the human species (i.e., later fertility is less ideal from a financial and health policy perspective as it is associated with greater rates of miscarriage and complications);^{104,105} and many women report in survey data that they are foregoing or delaying starting a family due to the rising costs associated with raising children.^{106,107}



B.26 Crime Rate in BC, 1998-2016

Figure 5.32 Crime Rate in BC, 1998-2016. Source: CANSIM Table 252-0051¹⁵⁴

Crime rates are not available in BC earlier than 1998, though it is widely acknowledged that the crime rate has been falling since the 1970s. The spatial distribution of crime is not equal across geographic space,¹⁵⁵ therefore it is difficult to ascertain the broader meaning of declining

crime rates without additional local context (in particular, that SDOH largely shape one's neighbourhood context and risk of being a victim of crime). Declining rates of crime also benefit all age groups somewhat universally, as it is better for everyone to live in a safer society. However, younger adults arguably benefit to a greater degree, given their longer potential lifespan in which to reap the benefits of a safe society. Despite this apparent decline in crime, what has occurred in terms of the rate of incarceration over this period?



B.27 Incarceration Rate in BC, 1998-2016

Figure 5.33 Incarceration Rate in BC, 1998-2016. Source: CANSIM Table 251-0005¹⁵⁶

Interestingly, one's risk of becoming incarcerated has fluctuated over the period from 1979-2016, but it has not declined as dramatically as one might expect given the concurrent decrease in crime.



B.28 Percentage With Postsecondary Education in BC, 25-44

Figure 5.34 Percentage with Postsecondary Education in BC, 25-44. Source: Canadian Census

There has been a marked increase in the percentage of young adults with some form of postsecondary education over the period from 1976-2016. In 1976, only 22% of adults 25-44 obtained a postsecondary certificate or higher, compared with 67% in 2016 – an increase of 45%. While this growth in the rate of educational attainment is often regarded as a positive generational attribute, it is worth understanding this increase within the context of both the cost of said education, and the benefits that higher education confers across this period.



B.29 Average Undergraduate Tuition and Fees in BC, 1976-2016

Figure 5.35 Average Undergraduate Tuition and Fees in BC, 1976-2016. Source: CANSIM Table 477-0077 and Generation Squeeze⁹²

When tuition figures are inflation-adjusted to 2016 dollars, a visible and striking pattern emerges. Tuition fees gradually increased on average over the period from 1976-2000, from roughly \$1,825 for a year of postsecondary to \$3,500. However, they skyrocketed between 2001 and 2004, climbing from \$3,300 to almost \$6,000 for full-time tuition. While the cost of undergraduate tuition has slightly declined in the intervening period from 2006-2014, they still remain at nearly \$5,400 in 2016, a nearly 300% increase compared to 1976. But what has this meant in terms of the amount of debt required to take on this level of educational attainment?

B.30 Average Student Loan Amount and Average Debt for a Four-Year Degree, 1976-

2010





Canada Student Loans data demonstrate an average overall increase in student debt over the total period. With median wages in decline, it takes longer to pay off these loans – hence the adaptation observed in seeing more young adults living at home while these loans are paid off. It is important to stress that these figures are likely an underestimate of the extent of student debt in British Columbia, as they do not include private bank loans, on which students are increasingly relying. Additionally, greater numbers of students take five or more years to finish their degrees, incurring more debt in the process.