

ACCOUNTABILITY, ALLOCATION, AND AN AGING POPULATION:
THE CASE FOR A MODIFIED CANADA HEALTH TRANSFER

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ABSTRACT

Canada is a decentralized federation wherein provincial governments are responsible for key policy areas such as healthcare. However, to assist provincial governments with their healthcare budgets, the federal government provides significant funding, including the Canada Health Transfer (CHT). Currently, the CHT is allocated to provinces on an equal per capita basis and grows with the national GDP growth rate (Canada, 2022). As Canada's population ages, the provinces will need to pay for the increases in healthcare demand and expenditure. An aging population is as much a national policy issue as it is a provincial issue. Canadians can move about the country freely, and the *Canada Health Act, 1984*, contains a portability provision. As the current CHT allocation does not consider age in the calculation, the provinces with aging populations may not be receiving enough federal funding to prepare for and cope with healthcare service demand and costs. This mis-alignment of healthcare needs and healthcare funding generates accountability concerns. Federal and provincial/territorial governments shift blame to each other and Canadians cannot hold either government accountable for the quantity and quality of the healthcare services that they pay for and receive.

This thesis examines the CHT from an accountability perspective and discusses whether and how the allocation of the CHT should be modified. Specifically, this thesis assesses why the CHT should incorporate healthcare-need indicators such as degree of population aging. Using multiple regression modeling, this thesis finds positive association between per capita provincial healthcare expenditure and various general trend indicators, including aging. This thesis uses the regression coefficient of the age indicator to construct a formula for age-based CHT top-up payments and compute payments provinces could receive in addition to the current equal per capita CHT payments. This thesis argues that an age-based top-up payment inclusion to the CHT will help strengthen the governments' accountability to Canadians. These payments would use a clear, transparent formula and make information available to stakeholders. If the federal government provides this top-up funding, it would signal to Canadians that it is fulfilling its funding role and providing adequate healthcare funding. Provincial governments would then be left to manage their healthcare systems as needed. With this clearer division of responsibilities, voters would be able to reward or punish a government (federal or provincial) for their healthcare decisions and hold each level of government accountable.

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TABLE OF CONTENTS

PERMISSION TO USE	i
ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
INTRODUCTION	1
CHAPTER 1 ACCOUNTABILITY FRAMEWORK	4
1.1 Canadian Federalism and Healthcare	4
1.2 Accountability in Healthcare	7
CHAPTER 2 FEDERAL FUNDING, CANADA'S AGING POPULATION, AND RESOURCE ALLOCATION	14
2.1 Evolution of Canadian Federal Healthcare Funding	14
2.2 Canada's Aging Population and Healthcare Expenditure	18
2.3 Theory of Resource Allocation	23
2.4 Existing Literature and Literature Gap	25
CHAPTER 3 METHODOLOGY	28
3.1 General Trends Related to Healthcare Expenditure	28
3.2 Multiple Regression Modeling: Sample and Variable Selection	29
3.3 Multiple Regression Modeling: Results and Analysis	32
CHAPTER 4 A POLICY PROPOSAL FOR HEALTHCARE FUNDING	36
4.1 Potential Indicators to Consider in CHT Funding Arrangement	36
4.2 An Age-based CHT Top-up Payment	38
4.3 Desirability of the Age-based CHT Top-up Payment	48
4.4 Feasibility of the Age-based CHT Top-up Payment	51
4.5 Policy Alternatives	54
CHAPTER 5 CONCLUSION	59
REFERENCES	62
APPENDIX: Calculations	82

LIST OF TABLES

Table 1.1 Five provisions in the <i>Canada Health Act, 1984</i>	5
Table 1.2 Governments’ responsibilities and accountability in the public healthcare sector.....	13
Table 3.1 Description of variables.....	30
Table 3.2 Multiple regression results.....	32
Table 3.3 Robustness checks on the multiple regression model.....	34
Table 4.1 Share of population aged 75 and over in the total population, 2000 vs. 2019.....	39
Table 4.2 Total annual provincial CHT top-up age payments for 2000 to 2019 (in millions).....	42
Table 4.3 Total annual provincial CHT top-up age payments for 2020 to 2024 (in millions)	44
Table 4.4 Total annual provincial CHT top-up age payments for 2025 to 2040 (in millions).....	46
Table 4.5 Provincial total age amounts per time period (in millions).....	47
Table 4.6 Provincial average annual per capita age amounts per time period (rounded to the nearest whole dollar).....	47
Table 4.7 Annual program costs: Pharmacare, CDCCP, and age amount (in millions).....	55

LIST OF FIGURES

Figure 2.1 Per capita provincial healthcare spending growth (in 2012 dollars).....	17
Figure 2.2 Federal funding as a proportion of total provincial spending (expressed as a percentage).....	18
Figure 2.3 Median age of provincial populations in 1977, 1996, and 2019.....	19
Figure 2.4 Percentage of people 65 and older in provincial populations, 1977, 1996, and 2019	20
Figure 2.5 Per capita average healthcare expenditures by age group.....	21
Figure 2.6 Percentage of people 75 and older in provincial populations, 1977, 1996, and 2019	22
Figure 4.1 Annual per capita CHT top-up age payments (2000 to 2019).....	41
Figure 4.2 Annual per capita CHT top-up age payments (2020 to 2024).....	44
Figure 4.3 Annual per capita CHT top-up age payments (2025 to 2040).....	45

INTRODUCTION

Canadians have access to universal, public healthcare. Provinces and territories have jurisdiction over healthcare. Healthcare constitutes the largest expenditure in provincial/territorial governments' budgets, as healthcare expenditures have increased in the past decade (Canadian Institute Health Information [CIHI, 2021]). By 2022, the average per capita spending for healthcare in Canada was approximately \$8,563, with total healthcare spending reaching around \$331 billion dollars (CIHI, 2023). With healthcare expenditures rising annually, the arrival of COVID-19 in 2020 only added pressure to a strained healthcare system (Canadian Medical Association, 2021; Statistics Canada, 2022b). To help provinces across Canada, in the 2023 federal budget, the federal government offered a one-time, top-up Canada Health Transfer (CHT) payment, an annual increase to the CHT payment, and bilateral agreements with the provinces regarding healthcare funding in shared priority areas (Canada, 2023a). However, questions as to whether this funding will be enough to help provincial healthcare systems now, and in the future, remain to be answered.

The Canadian federal government faces important decisions when allocating scarce public dollars for public programs and services. Currently, the Canadian federal government provides the CHT and other transfers to provinces/territories to help them fund healthcare. The CHT is one of the largest expenditures for the federal government, and provinces rely on the CHT to deliver public healthcare services (Canada, 2022). In fiscal year 2023-2024, the CHT was \$49.42 billion and is expected to be \$52.08 billion in 2024-2025 (Canada, 2023b), accounting for about 22% of provincial healthcare expenditures. Currently, the CHT grows annually in line with the national GDP growth rate and is allocated to the provinces and territories on an equal per capita basis, regardless of the population characteristics of the provinces. The provinces argue that the CHT is not adequate to meet the growing healthcare needs of their population. For example, although evidence shows people require more healthcare and incur greater healthcare cost as they age (CIHI, 2021), neither the annual escalator for the total CHT funding nor the allocation CHT formula considers population aging.

Worldwide, an aging population is a pressing public policy concern (Rouzet et al., 2019). An aging population has consequences for a nation's public services and benefits, such as healthcare (Kim, 2015; Li et al., 2020; Ogura & Jakovlevic, 2014; Oksuzyan et al., 2020; Wu et

al., 2019), and pensions and the economy, which includes the labour force and taxes (Bijak et al., 2007; Bongaarts, 2004; Chand & Tung, 2014; Razin et al., 2002; Yenilmez, 2014). Canada, with a universal public healthcare system, must prepare and respond to the challenges of an aging population (Mihailidis, 2023). The aging population has become a challenge in the federal-provincial/territorial fiscal relationships, as the provinces/territories deal with the pressures of an aging population on healthcare (CIHI, 2021; Mockler & Cools, 2017).

This thesis examines whether the federal government's current CHT's allocation is adequate in helping provinces deal with healthcare expenditures, including the impacts of an aging population. This question is critical because the provinces/territories are facing a crisis in their healthcare systems: As the population grows and ages, demand for healthcare increases, while the supply of family physician services has not kept pace and wait times are rising (CIHI, 2024; Tasker, 2024). CHT funding is also at the centre of another crisis, regarding the accountability of Canada's healthcare sector. While provincial/territorial governments blame the federal government for its limited contribution to healthcare funding, the federal government claims that the CHT is sufficient and that provinces/territories should improve the efficiency of their healthcare systems (Tasker, 2016). Indeed, Canada's decentralized federation is prone to a 'blame-game' (Hood, 2011) due to the blurred lines of responsibility for healthcare between the federal and provincial/territorial governments. Neither side is willing to take responsibility for the quantity and quality of the healthcare that Canadians need and pay for. As Canada's population ages and demands for healthcare increases, this accountability problem becomes more imperative.

To meet the healthcare needs of Canadians and enhance the accountability of healthcare, the thesis argues that it is essential to examine the CHT allocation formula through an accountability perspective. To do so, this thesis constructs a healthcare accountability framework derived from federalism and public administration literature. Using this framework, this thesis suggests that a clear, transparent needs-based funding formula could help with democratic accountability.

Using multiple regression modeling and panel data of Canada's 10 provinces, this thesis demonstrates whether and how the CHT should include healthcare need indicators, such as those of an aging population. This thesis focuses only on Canada's 10 provinces, excluding the three territories, because Canada's territories receive additional federal funding through the Territorial

Formula Financing payment (Canada, 2023b). The goal of the multiple regression model is to understand the association between each general trend indicator and per capita provincial healthcare expenditure. Using the age coefficient from the regression model results, this thesis constructs a needs-based formula that accounts for the trend of an aging population. This formula calculates age-based CHT top-up payments that provinces could receive in addition to their equal per capita CHT payment. Drawing from the literature on federalism, public policy, public administration, and resource allocation, this thesis then demonstrates that the policy option of age-based CHT top-up payments is both a desirable and feasible inclusion to federal healthcare funding. This modification to the CHT funding allocation would improve healthcare, strengthen accountability, and prepare the Canadian healthcare sector for an aging population.

This thesis aims to link multiple streams of literature and demonstrate how a clearer federal healthcare funding allocation that uses a healthcare trend indicator as a base could help meet the needs of the population and address the blame-game problem between the federal and provincial governments, thus strengthening accountability in healthcare. This thesis is organized as follows. Chapter 1 provides an accountability framework constructed by combining the literature about Canadian federalism with accountability studies. Chapter 2 proceeds with a background of Canadian federal healthcare funding over the decades and the challenges that an aging population presents for healthcare and federal healthcare funding. Chapter 3 presents the methodology, which involves multiple regression modeling. Chapter 4 discusses the findings and policy proposal. Chapter 5 concludes the thesis and suggests future research possibilities.

CHAPTER 1 ACCOUNTABILITY FRAMEWORK

This chapter first reviews both federalism and accountability literature and then describes the accountability framework used in this thesis.

1.1 Canadian Federalism and Healthcare

Canada is a highly decentralized federation whereby the provinces have constitutional jurisdiction over important areas, such as healthcare (Dodek, 2016; Martin et al., 2018), and enjoy a high level of fiscal autonomy (Marchildon & Bossert, 2018). The *British North America Act, 1867*, set forth the division of powers between the federal government and provinces. In 1982, the *British North America Act, 1867*, was renamed the *Constitution Act, 1867*, and presented significant constitution reforms (Dodek, 2016). Sections 91 and 92 of the *Constitution Act, 1867*, state the areas of authority for each level of government (Dodek, 2016). Provinces have constitutional jurisdiction over key public service programs, including healthcare. While the delivery of healthcare falls under provincial authority, both the federal and provincial governments have responsibilities for social program delivery and providing services of “reasonable quality,” as per section 36 of the *Constitution Act, 1982*:

- “1) Without altering the legislative authority of Parliament or of the provincial legislatures, or the rights of any of them with respect to the exercise of their legislative authority, Parliament and the legislatures, together with the government of Canada and the provincial governments, are committed to
- a) promoting equal opportunities for the well-being of Canadians;
 - b) furthering economic development to reduce disparity in opportunities; and
 - c) providing essential public services of reasonable quality to all Canadians.”

In fulfilling its responsibilities, the federal government allocates funds to the provinces to be spent on public programs such as healthcare.

Medicare, providing insurance for applicable hospital services and physician services, gives Canadians universal, public access to these services (Hajizadeh & Keays, 2023; Naylor et

al., 2020). The *Canada Health Act, 1984*, (Canada, 1984) defines and explains the basic principles of Medicare. It contains five provisions: public administration, comprehensiveness, universality, portability, and accessibility, universality. Table 1.1 lists and describes each provision.

Table 1.1: Five provisions in the *Canada Health Act, 1984*

Provision:	Description
Public Administration	Healthcare plans must be administered by a public authority and on a non-profit basis.
Comprehensiveness	All insured services are insured by provincial or territorial healthcare plans.
Universality	All insured individuals within a province or territory receive healthcare services.
Portability	Requirements for payments regarding insurance for individuals when outside the home province or territory and/or country.
Accessibility	Provincial and territorial insurance plans must provide access to insured services.

Source: Canada, 1984

The *Federal-Provincial Fiscal Arrangements Act* contains the calculations for the CHT and links to the five provisions in the *Canada Health Act, 1984*. Provincial governments are required to comply with these five principles to ensure that Canadians within each province have access to healthcare services that meet minimum national standards (Marchildon & Mou, 2014).

Provinces that do not comply with the terms in the *Canada Health Act, 1984*, may see some of their federal funding pulled back by the federal government (Marchildon & Mou, 2014).

While both levels of government have constitutional taxation powers, the provinces are limited to direct taxation, and their expenditure requirements can exceed their revenue-generating capacity (Richer, 2007). As well, own-source revenue varies across the provinces (Marchildon & Bossert, 2018). Healthcare is a costly policy area, and the federal government has been permitted to have a role in healthcare due to its federal funding capabilities (Marchildon, 2018). The federal government plays a significant funding role as provinces rely on federal transfers to manage their respective health care systems (Marchildon, 2018).

Through these federal healthcare transfers and related legislation, such as the *Canada Health Act, 1984*, the federal government wields ‘influence’ over healthcare (Boadway, 1996; Fierlbeck, 2023). The federal spending power enables the federal government to foray into provincial jurisdictions and provide funding through conditional and unconditional transfers (Richer, 2007). As noted, the federal government has more taxation capacity and thus revenue raising abilities in comparison to provincial governments. The federal funding role in healthcare partially addresses the vertical fiscal imbalance (VFI) between the federal government and provinces (Boadway, 2004; Boadway & Watts, 2000). The VFI is the ‘gap’ between the revenues raised by the federal government and its expenditure responsibilities (Boadway, 2004; Boadway & Watts, 2000; McIntosh, 2004). Addressing the VFI is important when the conditional expenditures exceed revenue generating capacity for important areas, such as healthcare (McIntosh, 2004).

To ease and narrow this gap, the federal government redistributes federal tax-revenues as transfers to provincial governments (Boadway, 2004; Boadway & Watts, 2000). Additionally, while there is no constitutionally named federal spending power, both the federal and provincial governments have responsibilities to provide services of “reasonable quality for all Canadians,” as per section 36 of the *Constitution Act, 1982*. To uphold this obligation, the federal government assumes a funding role and allocates funding to the provinces intended to be spent on public programs (Boadway, 1996). Thus, “the use of the federal spending legitimizes the ability of the federal government to make transfers of all sorts” (Boadway, 1996, p. 324). In this sense, provinces are the ‘managers’ of healthcare and are tasked with overseeing program and service

delivery. The federal government assumes an important ‘funder’ role due to the Constitution, the *Canada Health Act, 1984* and corresponding transfers.

Herein lies the issue of healthcare funding and accountability. As a ‘funder,’ how is the federal government held responsible for its funding decisions? How does a lack of funding impact provincial governments and their responsibilities as ‘managers?’ These questions highlight this muddled area of accountability and consequently creates the conditions for the ‘blame-game.’

1.2 Accountability in Healthcare

Gray and Jenkins (1993) consider accountability as, “an obligation to present an account of an answer for the execution of responsibilities to those who entrusted those responsibilities” (p. 55). Bovens (2007) describes accountability as, “the relationship between an actor and a forum, in which the actor has an obligation to explain and justify his or her conduct, the forum can pose questions and pass judgment, and the actor may face consequences” (p. 450). Accountability involves more than just being entrusted with responsibilities, as it includes some sort of mechanism, such as the looming threat of punishment that holds someone to account for action or inaction (Behn, 2001). Taken together, these definitions suggest accountability is a relationship between two or more entities, whereby one entity is held responsible for its decisions and/or actions through some mechanism that rewards and/or punishes.

When considering public sector accountability, three general accountability categories pertain: financial, performance, and democratic (Brinkerhoff, 2004). Financial accountability can be defined as “tracking and reporting on allocation, disbursement, and utilization of financial resources, using the tools of auditing, budgeting, and accounting” (Brinkerhoff, 2004, p. 373). Performance accountability involves the outputs and results of a policy, program, and so forth (Brinkerhoff, 2004). Democratic accountability revolves around if and how a government is achieving electoral promises, upholding its obligations, and earning and maintaining trust and legitimacy from the public (Brinkerhoff, 2004). This thesis focuses on democratic accountability and the accountability relationship between elected officials and constituents.

This democratic accountability relationship assumes a principal-agent form whereby the agent accepts responsibilities entrusted to it by the principal (Bovens, 2007; Bovens et al., 2008; Gray and Jenkins, 1993). Constituents (principle) elect politicians (agents) and hold them

accountable for their decisions and actions through elections. Voting is the definitive accountability mechanism within the hands of constituents, as elections are a direct way to punish or reward a politician for past behaviour and actions (Fiorina, 1981). In holding politicians accountable, it is important to establish who is accountable to whom and who is accountable for what (Bovens, 2009). However, federalism has implications for democratic accountability because the blurred lines of responsibility can make it difficult for a constituent to correctly hold a politician accountable and punish or reward accordingly (Cutler, 2008).

As discussed, the Canadian federal government is responsible for providing healthcare funding. Since taxes comprise most government revenues, constituents expect governments to align spending decisions with the taxpayers' needs. They also expect the provincial governments to manage their healthcare systems and deliver appropriate and timely healthcare. Voting within a federation relies on a constituent being able to correctly identify and attribute what each level of government is responsible for. As both levels of government share in fiscal and legislative responsibility within Canadian healthcare, this ambiguity can make it difficult for voters to properly attribute responsibility (Cutler, 2017). Furthermore, this ambiguity can be advantageous for politicians who wish to engage in the 'blame-game.'

Canada's federalism environment creates a space for a blame-game between the two levels of governments and contributes to a crisis of accountability (Cutler, 2008; Hood 2011). Hood (2011) suggests that elected officials are incentivized to engage in blame games, deploying strategies to minimize or remove blame attributed to a decision or outcome. For example, when blame is inevitable, politicians and bureaucrats may say the fault lies with a predecessor or a collaborator, shift blame onto another government, the bureaucracy or other agencies, avoid blame by using unclear lines of responsibility between jurisdictions, and/or simply deny there is a problem at all (Hood, 2011).

The success of the blame-game in a federation depends on several factors. First, the institutional structure affects how blame can be shifted (Hood, 2011). In multi-level institutions, blame can be shifted to other levels of governments or agencies, regardless of whether the blame is warranted (Heinkelmann-Wild et al., 2018, 2020; Heinkelmann-Wild & Zangl, 2020; Hobolt et al., 2013; Hobolt & Tilley, 2014; Hood, 2011; Mortensen, 2012). Second, the stage in the policy cycle makes a difference, with blame shifting more difficult at the policy implementation stage than the policy formulation stage. Third, opposition parties (Weaver, 2018) and competitive

elections may affect blame-avoidance strategies because opposition parties may ensure that shifting blame to one level of government does not reduce the blame for the other level (Cutler, 2008). Fourth, voters' willingness and ability to assign responsibility for policies and outcomes to the appropriate government level affects blame shifting (Cutler, 2004, 2008). Voters' willingness to reward or punish a government can be related to their political partisanship (Bisgarrd, 2015; Campbell et al., 1960; Jin et al., 2023; Rodden & Wibbels, 2010; Tilley & Hobolt, 2011), but their capacity to assign responsibility to a government is often limited, particularly in a decentralized setting (Gélineau & Bélanger, 2005, 2006; Hobolt & Tilley, 2014). In some cases, polarization can help with responsibility attribution (Wilson & Hobolt, 2015). Competitive elections and politicization of issues can generate awareness and learning opportunities because issue salience can induce voters to pursue more information (Wilson & Hobolt, 2015). However, this can also lead to confirmation biases and possible inaccuracies in making judgements about responsibility (Wilson & Hobolt, 2015).

The nature of Canada's decentralized federalism makes it challenging in respect to voter responsibility attribution (Anderson, 2010; Cutler, 2008). A decentralized environment, where the lines of decision-making authority are entangled between the levels of government, can impact a voter's ability to separate responsibility areas (León, 2010). This is particularly challenging when the distribution of revenue and expenditure powers are highly entangled, thus making it difficult for voters to attribute responsibility (León, 2012). For instance, the institutional structure of a federation plays a role in the economic voting and responsibility attribution relationship: This relationship is stronger when authority and expenditure and revenue responsibilities are concentrated within one level and not mixed between the two (León & Orriols, 2016). Economic responsibility is affected by the often-blurred lines of responsibility between federal and provincial governments, as each level impacts different economic dimensions (Anderson, 2010), and responsibility attribution can be levied at the wrong level of government (Cutler, 2002).

For example, Gélineau and Bélanger, (2005) studied economic conditions and voting behaviour in Canada, analyzing whether federal political incumbents and/or provincial political incumbents are rewarded or punished for national and/or provincial economic conditions. Using electoral data from 1953 to 2001, they found that the federal incumbents were held responsible for national economic conditions but not for provincial economic conditions (Gélineau &

Bélanger, 2005). However, provincial incumbents that were of the same federal political party in power were punished for poor national economic conditions, despite provincial economic conditions (Gélineau & Bélanger, 2005). These findings suggest that claiming credit for provincial economic conditions does not help a federal incumbent gain votes while a provincial government can be punished for national economic conditions (Gélineau & Bélanger, 2005). As well, these findings suggest that voters may struggle with attributing economic responsibility to provincial governments (Gélineau & Bélanger, 2005). Thus, a decentralized environment can result in responsibility attribution directed at the wrong level of government (Gélineau & Bélanger, 2005).

Canada's decentralized environment makes the voter responsibility attribution even more complex as both the provincial and federal governments have taxation powers, provinces have authority over healthcare, and the federal government plays a key funding role in healthcare (Cutler, 2004). This federal funding role can blur the lines of electoral accountability because it can be difficult to decipher whether "insufficient resources provided by the federal government or bad administration of those resources by the provincial governments is to blame for shortcomings in a social program" (Richer, 2007, p. 21). This arrangement of federal transfers, provincial management and own-source funding makes it difficult for voters to assign responsibility (Cutler, 2004). Further complicating healthcare policy is the federal government's administrative role in healthcare enshrined in the *Canada Health Act, 1984* (Canada, 1984) and its responsibility for the healthcare of First Nations and the armed forces (Dodek, 2016). If constituents are unable to decipher the lines of responsibility for each level of government, this has consequences for democratic accountability.

Intergovernmental negotiations also create an environment for blame-games (Lecours & Béland, 2009). Using Canadian Equalization policy as the unit of analysis, Lecours and Béland assessed the inherent competitiveness within Canadian federalism (2009). Canadian provincial governments do not have representation at the federal level and thus cannot directly influence federal policy (Lecours & Béland, 2009). Provincial governments engage in negotiations with the federal government wherein provincial governments are incentivized to fight for the interest of their respective province (Lecours & Béland, 2009). When a negotiation outcome is counter to the 'perceived interests' of a province, provincial governments tend to gain support from constituents (Lecours & Béland, 2009). This environment sets the stage for the blame-game, as

provincial governments can shift blame onto the federal government for a negative outcome but claim credit for a positive outcome (Lecours & Béland, 2009). Shifting into federal healthcare funding, if federal healthcare funding is reduced, provincial governments can shift blame onto the federal government for healthcare service deficits and constituents are left to disentangle responsibility (Jordan, 2008).

In this complex situation, voters have a difficult task determining which level of government is responsible for what. Voters struggle with punishing and rewarding governments when it comes to healthcare (Cutler, 2004). Cutler (2008) assessed electoral accountability and government responsibility levels in Canada, examining several policy areas and determining to which level of government voters attributed responsibility. Survey data was collected from voters in Saskatchewan and Ontario who participated in provincial elections and the 2004 federal election (Cutler, 2008). Results indicated that if voters feel negatively about healthcare outcomes and can assign responsibility to a certain level of government, they are more likely to vote against the current government (Cutler, 2008); conversely, voters who cannot assign responsibility are less likely to vote against the current government, and their voting behaviour is likely to be aligned with those who see no decline in the healthcare system (Cutler, 2008). Voters who view both levels of government as being equally responsible may either hold no government to account or attribute equal blame to the two levels of governments (Cutler, 2008).

In Canada, most voters face challenges in distinguishing the healthcare responsibilities of the federal and provincial governments (Cutler, 2008), and in Canadian history blame games have been rampant. For instance, in 2004 the Premier's Council on Canadian Health Awareness, representing all the premiers in Canada, ran an advertising campaign that blamed the federal government for inadequate healthcare funding (Cutler, 2008). In 2022, the premiers were behind another advertising campaign that blamed the federal government for insufficient healthcare funding (Council of the Federation, 2022).

If voters are going to hold federal and provincial governments accountable for their decisions, they must know which government is responsible for these decisions. Federalism does not “destroy” electoral accountability, but it does pose challenges, primarily the “confusion it creates” (Wleizen & Soroka, 2010, p. 34). This affects if voters know what each level of government is responsible for and then being able to reward and punish accordingly through elections (Wleizen & Soroka, 2010). For instance, healthcare dissatisfaction amongst

constituents can affect voting but only when those constituents can correctly identify which level of government is responsible for what (Cutler, 2004). Therefore, it is important that voters are able to hold governments accountable for what each is responsible for, and if voters cannot, this is an Issue for democratic accountability (Cutler, 2017). With a better understanding of the responsibilities of each level of government, constituents can hold each level of government accountable for its decisions and actions by punishing or rewarding them in elections.

One possible policy instrument to help democratic accountability is a healthcare needs-based federal funding formula. An appropriate, clear, and accessible funding formula can help clarify responsibilities and help constituents monitor a government's decisions and actions. Clarity over which level of multilevel government responsibility attribution can help democratic accountability (Anderson, 2000). Cutler's (2004) analysis of voting behaviour suggests that voters who view healthcare as a shared responsibility struggles with holding a government accountable. A simple and transparent funding formula could better enable constituents to attribute responsibility. Constituents could verify how funding is calculated at the federal level and allocated to the provinces. On the provincial side, constituents should be aware of the formula and resulting funding amounts transferred to a province.

Democratic accountability could therefore be strengthened as this formula and funding could help clarify the respective positions of each level of government and help diminish the 'blame-game.' For instance, provinces blame the federal government for a lack of funding which impacts their own ability to manage health care. However, having the federal government provide this needs-based funding would be a way to convey to Canadians that they are fulfilling their funding role and providing adequate funding for an actual healthcare need. Using an actual healthcare need indicator within the formula would be a way for the federal government to acknowledge the healthcare cost-pressures populations have.

A transparent needs-based formula would clarify the responsibilities that the federal government has as a 'funder.' The federal government is not in charge of managing healthcare systems but instead plays a funding role. Provincial governments are tasked with managing their respective healthcare system, and this formula does not blur the lines of responsibility but clarifies what each level of government is responsible for. Thus, voters should be able to take this into account when rewarding or punishing a government (federal or provincial) for health care decisions, that is, properly holding each level accountable for what is their responsibility.

Table 1.2 describes the accountability framework used in this thesis regarding healthcare.

Table 1.2: Governments’ responsibilities and accountability in the public healthcare sector

Government:	Responsibilities	Democratic Accountability
Federal Government	Upholds federal responsibilities per the <i>Constitution Act, 1867, 1982</i> . Allocates resources to help provinces address healthcare needs and costs.	Fulfills its ‘funder’ role in healthcare. Formula uses a healthcare need indicator; this base is actually related to healthcare costs. Voters can evaluate if the federal government is upholding its role as a funder by providing this funding.
Provincial Governments	Upholds provincial responsibilities per the <i>Constitution Act, 1867, 1982</i> . Manage provincial healthcare systems. Deliver healthcare services to their population.	Fulfill their ‘manager’ role in healthcare. Use this funding for healthcare for services/delivery needed by their respective populations. Voters can evaluate if a provincial government is upholding its role as a manager by allocating this funding to necessary services.

Source: Author’s creation

CHAPTER 2 FEDERAL FUNDING, CANADA'S AGING POPULATION, AND RESOURCE ALLOCATION

This chapter provides a background on Canadian federal healthcare funding and describes how funding mechanisms have changed over the past decades. The challenges of an aging population are then examined. This chapter then provides a review of the resource allocation literature, which will be used in the analysis of this thesis. Finally, this chapter reviews existing literature and identifies a literature gap.

2.1 Evolution of Canadian Federal Healthcare Funding

Federal healthcare transfer amounts have fluctuated since the establishment of Medicare in 1957. Between 1957 and 1976, federal funding involved cash payments and took the form of cost sharing with the provinces (Naylor et al., 2020). The federal government envisioned establishing national social programs such as Medicare and offered a funding structure to enable the provinces to deliver services in alignment with a universal healthcare objective (Hajizadeh & Keays, 2023). Initially, Medicare was intended as an equal funding partnership between the federal government and the provincial government, with the federal government providing 50% of healthcare funding for each province (Mackenzie, 2015; Naylor et al., 2020). It is important to state that this funding partnership was not meant to be an equal healthcare delivery partnership, as the provinces would retain authority over healthcare decision-making (Mackenzie, 2015).

As time proceeded, changing economic environments threatened this goal. Reduced revenues, high expenses, and an imperative to reduce spending resulted in the federal government making significant changes to how it funded healthcare (Hajizadeh & Keays, 2023). While the objective of universal healthcare remained, how this objective was to be achieved changed. Provinces were now being tasked with providing more of their own-source revenues for healthcare, and the equal funding partnership was eroding (Hajizadeh & Keays, 2023). Additionally, the grand vision of national social programs involving massive federal contributions was also diminishing, as the federal government looked to reduce its role as a funding partner (Hajizadeh & Keays, 2023).

Starting in the 1970s, this equal funding partnership changed and marked the beginning of decreasing federal contributions over the next decades. As the federal government practiced fiscal restraint and curbed its spending, federal contributions to healthcare funding became a casualty (Mackenzie, 2015; McIntosh, 2004). During the 1970s, federal healthcare funding contributions decreased from 50% to 37% (Mackenzie, 2015). By 1977, federal contributions fell to 25% with the introduction of the Established Program Financing grant (EPF), a block grant which replaced cost-sharing. Federal funding now constituted an equal per capita cash payment and tax-point transfer from the federal government to the provinces (Gauthier, 2011; Naylor et al., 2020). To provide provinces with tax room, the federal government reduced its personal and corporate tax rates (Canada, 2014; Gauthier, 2011). The tax-point transfer consisted of 13.5 federal personal income tax points and one federal corporate tax point (Mou, 2021). There was an associated equalization measure attached to the tax-point transfer to help provinces with lower tax-revenue generating capabilities (Gauthier, 2011). Provinces with stronger economies and tax-revenue generating capabilities were deemed to benefit more from the tax-point transfer, and the equalization measure was meant to help those provinces with weaker economies (Gauthier, 2011). Following the funding change in 1977, federal healthcare contributions plunged, and by the 1990s federal healthcare funding was only 16% (Mackenzie, 2015).

In 1996, another significant change to federal healthcare funding occurred. The EPF was replaced by a new block transfer, the Canada Health Social Transfer (CHST) (Canada, 2014; Mackenzie, 2015; Naylor et al., 2022). The CHST involved a cash grant and tax-point transfer, allocated on an equal per capita basis (Canada, 2014; Naylor et al., 2020). The CHST did not contain a "built-in escalator formula" (McIntosh, 2004, p. 3). This feature negatively impacted the provinces' ability to plan and budget as CHST funding amounts would be uncertain (McIntosh, 2004). Following the establishment of the CHST, federal healthcare funding contributions fell to an all-time low, ranging between 10% and 11% (Mackenzie, 2015).

The CHST marked a momentous change to the funding partnership between the federal government and provincial governments. The previous decades saw the federal government's role of being a dependable, equal funding partner slowly erode, and the CHST and resulting reduction in federal contributions all but completely eroded this relationship (Mackenzie, 2015). Unfortunately, this decline in federal funding came at a dire time for provinces, which were dealing with rising healthcare costs and strained provincial budgets (Mackenzie, 2015). The

provinces were left with the increased burden of funding healthcare, while observing the federal government prioritize federal debt reduction at the expense of federal funding commitments (McIntosh, 2004).

Mounting criticisms resulted in a substantial change to the CHST (Hajizadeh & Keays, 2023). Under Prime Minister Paul Martin, the CHST was split into two distinct block transfers: The CHT and the Canada Social Transfer (Canada, 2014; Hajizadeh & Keays, 2023; Mou, 2021). Through the CHT, the federal government provided cash payments and tax-point transfers on an equal per capita total amount basis (Canada, 2020; Hajizadeh & Keays, 2023). In 2004, the first ministers agreed to the *10-Year Plan to Strengthen Healthcare* (2004 Accord) (Canadian Intergovernmental Conference Secretariat, 2004). Starting in fiscal year 2006-2007 and up to fiscal year 2017-2018, the 2004 Accord promised an annual growth rate of 6% to the cash basis of the CHT (Mou, 2021). Once the 2004 Health Accord agreement was implemented, the provinces received an immediate increase in federal healthcare funding with assured yearly increases (Gauthier, 2011). Overall, the 2004 Health Accord resulted in total federal funding contributions rising to 23% (Mackenzie, 2015).

In 2011 Prime Minister Stephen Harper stated that beginning in fiscal year 2017–2018, the cash basis of the CHT would be dependent upon a three-year, moving average gross domestic product (GDP) growth rate, with funding payments growing a guaranteed 3% annually (Mou, 2021). In fiscal year 2014–2015, the tax-point transfer component of the CHT was removed, and federal funding was now calculated and disbursed on an equal per capita cash basis (Hajizadeh & Keays, 2023). In 2016, Canadian premiers asked for an annual CHT growth rate of 5.2%, to start in fiscal year 2017–2018 (Mou, 2021). The federal government, now under Prime Minister Trudeau, offered a 3.5% growth rate; ultimately the CHT escalator of GDP growth rate of 3% remained (Hajizadeh & Keays, 2023; Mou, 2021). However, the federal government offered ad hoc CHT top-up payments to provinces (Canada, 2023b; Hajizadeh & Keays, 2023).

The federal government also pledged \$198.3 billion over the next decade in federal healthcare funding (Canada, 2023a). Additionally, the federal government engaged in bilateral agreements with the provinces for shared health priorities (Canada, 2017; Canada, 2023c). These priorities include home and community care and mental health and addictions services (Canada, 2017). With \$11 billion available for the next decade, these bilateral agreements contain the stipulations for how each province will spend funding within these health priority areas: The

common indicators, targets, and outcomes (Canada, 2017). In 2023, the federal government expanded the priority areas (Canada, 2023c).

Over time, provinces have become dependent on federal healthcare transfers and have had difficulty providing adequate healthcare services and managing their constituents’ expectations for these services (Fierlbeck, 2023; McIntosh, 2004). These expectations must be managed because constituents tend to perceive healthcare services as an entitlement, making it difficult to scale them back when federal transfers decline. However, as Canadian federal healthcare funding evolved, the federal government routinely reduced its funding commitment and shifted more responsibility onto the provinces (Fierlbeck, 2023; McIntosh, 2004).

Over the period 1977–2019, provincial healthcare expenditures grew significantly, but the proportion of federal funding in total provincial healthcare expenditure decreased. Figure 2.1 shows per capita provincial healthcare spending in 1977 and 2019 and the changes. Figure 2.2 shows the proportion of federal healthcare funding in total provincial healthcare expenditures over the same period.

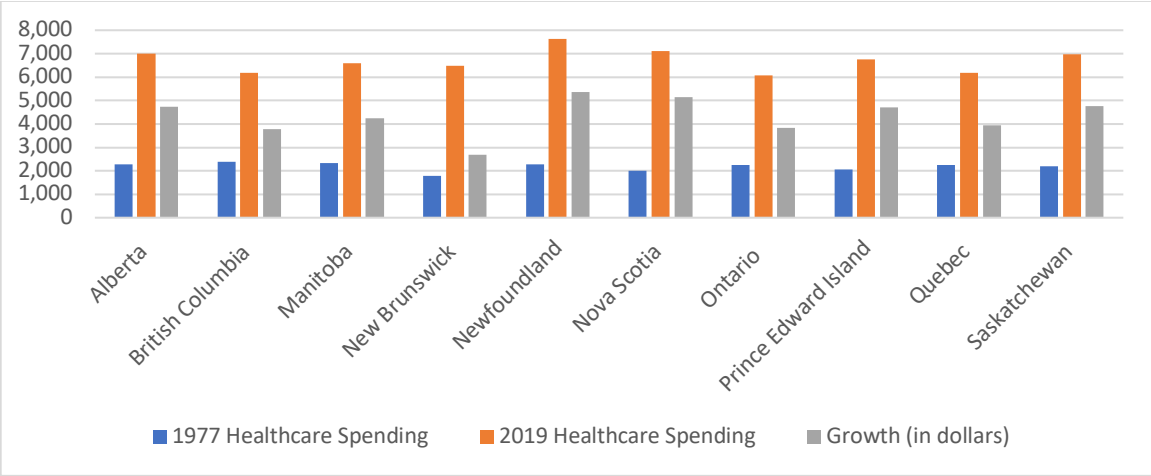


Figure 2.1: Per capita provincial healthcare spending growth (in 2012 dollars)

Source: CIHI, 2021

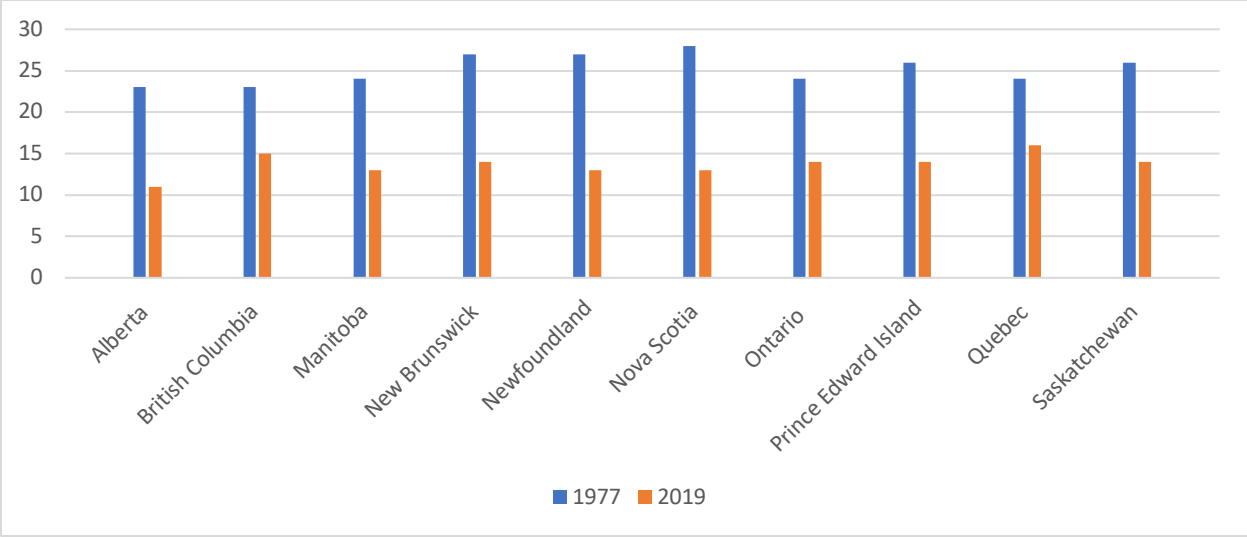


Figure 2.2: Federal healthcare funding as a proportion of total provincial healthcare spending (expressed as a percentage)

Source: CIHI, 2021

Although the federal government has promised more healthcare funding, the current CHT allocation formula remains the same since fiscal year 2014-2015 whereby CHT amounts are calculated and disbursed using a per capita cash basis. This approach to determining healthcare funding is unrelated to the healthcare needs of the population. Consequently, provinces with significant healthcare needs and costs may not be receiving enough funding to provide the necessary services for their population, thus generating accountability concerns. As Canada undergoes a crisis in healthcare including accountability, appropriate federal healthcare funding is imperative, particularly when the population is aging and requiring more and better healthcare.

2.2 Canada’s Aging Population and Healthcare Expenditure

In 1966, when the federal government began to cover 50% of expenditures on physician services in the provinces, the median age in Canada was 25.5 years (Gibbard, 2018). In 2022, it was 41 years (Statistics Canada, 2023c). Figure 2.3 shows the change of median age within each province for the years 1977, 1996, and 2019—two milestone years in federal healthcare funding history and the last year before the 2020 pandemic.

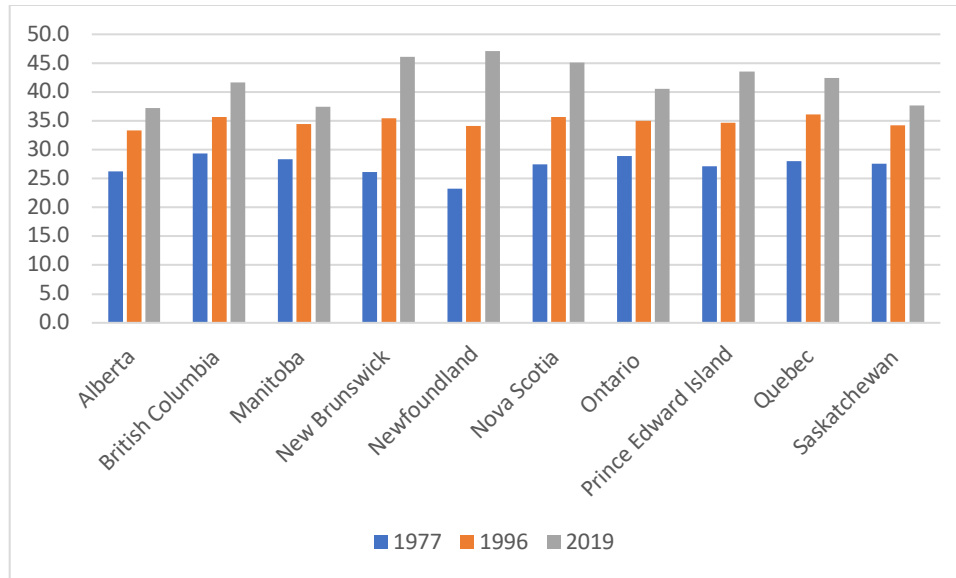


Figure 2.3: Median age of provincial populations in 1977, 1996, and 2019

Source: Statistics Canada, 2023c

Median age increased in every Canadian province between 1977 and 2019. This increase in median age aligns with the increase in Canada’s 65 and over population. Over the last decade, Canada’s population aged 65 or more (seniors) has increased by 4%. In 2019, almost 20% of the Canadian population were seniors, and, by 2035, almost a quarter of the population is projected to be a senior (Mihailidis, 2023).

Figure 2.4 shows the proportion of those 65 years and older in each province for the years 1977, 1996, and 2019. As seen in the figure, from 1977 to 2019, the share of seniors in the provincial population increased dramatically in all the provinces, doubling or almost doubling in British Columbia, Quebec, and all four Atlantic provinces (New Brunswick, Nova Scotia, and Prince Edward Island).

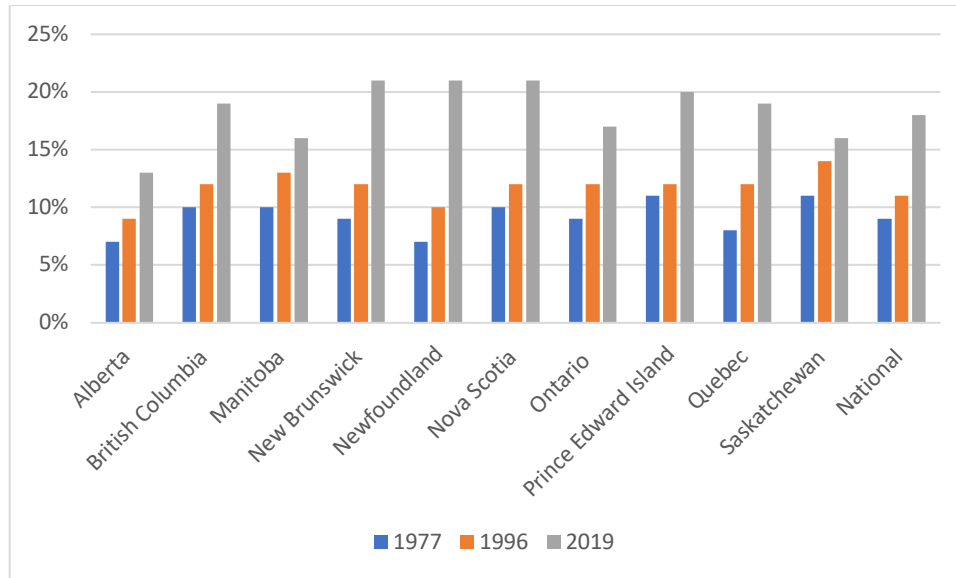


Figure 2.4: Percentage of people 65 and older in provincial populations in 1977, 1996, and 2019

Source: Statistics Canada, 2023c (calculations completed by the author)

A contributor to the increase of seniors within the population is the aging of one of Canada’s largest cohorts: the ‘baby-boomers.’ The baby-boomer cohort, those born between 1946 and 1965, accounts for almost 25% of Canada’s population (Statistics Canada, 2022a). In the year 1996, the oldest of this cohort was 50. In the year 2011, the oldest of the baby-boomers reached the age of 65 and by 2019 was 73. By 2031, the youngest in this cohort will reach 65-years of age, with the entire cohort now between the ages of 65 and 84 (Statistics Canada, 2022a). This trend of Canada’s aging population has implications for healthcare demand and expenditure.

Healthcare costs generally increase when one reaches the age of 65. According to the Canadian national health expenditure database, the average healthcare expenditures per capita are highest in two periods of a person’s life: in infancy and after the age of 65 (CIHI, 2021). Figure 2.5 shows the average healthcare expenditures per capita by age bracket in 2019 dollars.

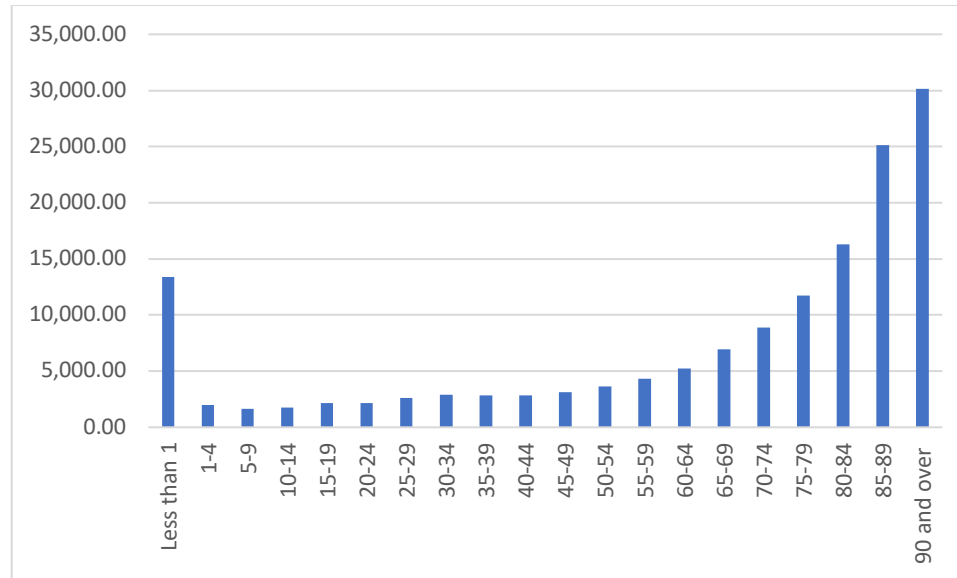


Figure 2.5: Per capita healthcare expenditures by age group

Source: CIHI, 2021

Healthcare expenditures rise dramatically after the age of 75 (CIHI, 2019). For instance, average per capita healthcare expenditure for the age bracket 65 to 69 is \$6,955, and this amount nearly doubles to \$11,733 for the age 75–79 age bracket (CIHI, 2021). The prevalence of developing and having a chronic disease increases when one reaches the age 75 (Public Health Agency of Canada, 2020). For example, the percentage of those 65 and over who report having osteoporosis is around 20%; however, this number rises to 28.8% for those 75 to 84 and 36.9% for those 85 and over (Public Health Agency of Canada, 2020). This trend is also found for such ailments as hypertension, cancer, and stroke (Public Health Agency of Canada, 2020).

The 75 and over population in Canada is also rapidly increasing. Figure 2.6 shows the proportion of those 75 and over within provincial populations.

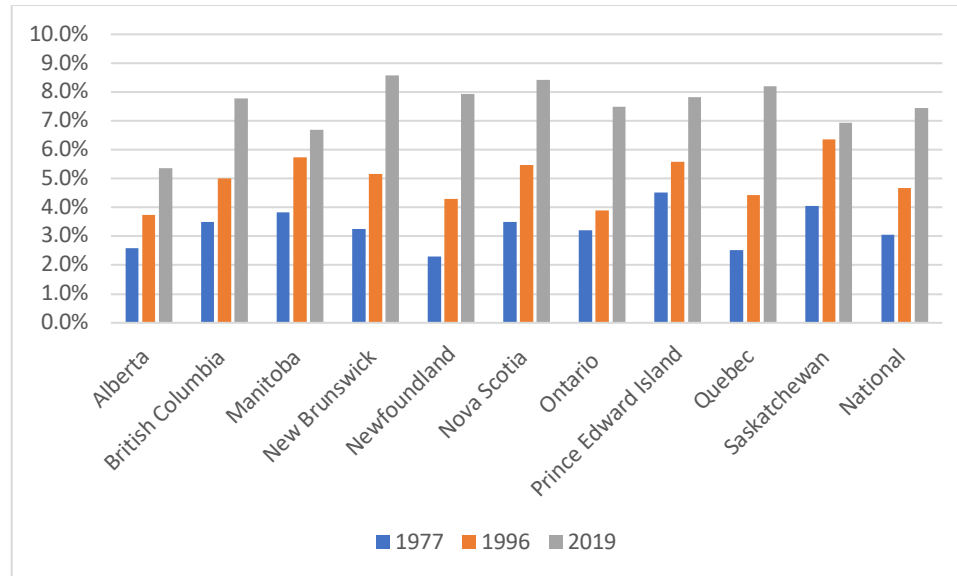


Figure 2.6: Percentage of people 75 and older in provincial populations in 1977, 1996, and 2019

Source: Statistics Canada, 2023c (calculations completed by the author)

The national rate of those 75 and over within the population has more than doubled since 1977 in six of Canada’s provinces. The age 75 and over rate in the provinces of Newfoundland and Quebec has more than tripled since 1977. As more individuals are living longer, an aging population means higher healthcare needs and per capita healthcare costs. Against this backdrop, the trend of Canada’s aging population presents challenges. For instance, the aging of the baby-boomer cohort presents a potential timing issue (Wister & Speechley, 2015). With the full impact of this cohort expected to be felt between 2030 and 2040, it is essential to anticipate and prepare for their healthcare demands and costs.

Population aging is a national trend and national-level public policy concern. Canadians, including seniors, can migrate between provinces (Saunders, 2018). Older Canadians can reside in whichever province they choose, and they are not bound to live in the province in which they worked and to which they contributed income tax revenues (Messacar, 2022). Between 2009 and 2019, the Atlantic provinces as well as British Columbia had the largest inflow of seniors while the prairie provinces and Quebec had the largest outflow of seniors (Béland & Tombe, 2023). Thus, there could be a possible mismatch between a province’s taxpayers and its population using healthcare.

Healthcare expenditures rise as populations age (CIHI, 2021), and because the *Canada Health Act, 1984*, includes a portability provision, provinces with an influx of seniors must provide healthcare services to these individuals and pay for associated healthcare costs. For example, the inflow of seniors into British Columbia increased healthcare expenditures by \$150 million between 2009 and 2019 (Béland & Tombe, 2023). However, the CHT, allocated on an equal-per-capita basis, does not provide more per capita CHT to provinces with a high population of seniors.

For these reasons, addressing the healthcare cost pressure of an aging population is a national responsibility as much as a provincial responsibility. Since seniors are expected to comprise almost a quarter of Canada's population over the next few decades (Statistics Canada, 2022b), the federal government's funding role will become more important. As part of a 'national strategy' to deal with Canada's aging population, one recommendation is to include age in federal healthcare transfers (Mockler & Cools, 2017). Addressing population aging in federal healthcare funding not only helps provinces deliver healthcare, but also helps improve the transparency of federal funding policy and address the lack of accountability in Canada's public healthcare sector. A reasonable policy option would be needs-based federal funding that incorporates indicators associated with healthcare expenditure, such as an aging population.

2.3 Theory of Resource Allocation

To help determine whether Canadian federal funding should incorporate the needs-based indicator of an aging population, this thesis uses a lens of resource allocation. Allocation is an important activity for organizations. Identifying how much and where to allocate scarce resources are important tasks for decision-makers across the private and public sectors (Bower & Gilbert, 2006; Cutt, 1974; Dietrichson, 2013; Fisher, 1998). This allocation process involves the central unit deciding which decentralized units are to receive revenues and/or costs and how much each unit should receive (Zimmerman, 2020). Efficient resource allocation helps to ensure that the decentralized units are given enough revenues to achieve the objectives and goals expected of them (Merchant and Van der Stede, 2017). In turn, receiving adequate revenues should help decentralized units steer their behaviours and decision-making towards realizing objectives and goals; thus, efficient resource allocation influences the decision-making process

of the decentralized units (Anthony & Govindarajan, 2007; Anthony & Young, 2003; Merchant & Van der Stede, 2017).

Canada is a highly decentralized federation, positioning provincial governments as the ‘managers’ of their respective healthcare system while the federal government is a ‘funder.’ Arguably, a decentralized approach can make the policy process more effective, as this is a ‘bottom-up’ not a ‘top-down’ approach (Lane, 2000). Those who are managing policies and programs may be in a better position to understand the best usage for funding and are thus granted decision-making authority from the central authority (Lane, 2000).

How resources are allocated and the measures attached help steer or ‘control’ behaviours within an organization to align them with the organization’s goals, objectives, and strategies (Merchant & Van der Stede, 2017; Zimmerman, 2020). The base used in determining how the allocation is determined is crucial. For instance, the central unit can elect to invest revenues in decentralized units that are performing well, performing poorly, or on an equal basis to all units regardless of performance (Zimmerman, 2020). The main criterion is to ensure that the allocation aligns with the organization’s goals, objectives, and strategies (Merchant & Van der Stede, 2017; Zimmerman, 2020). An appropriate allocation base provides the necessary revenues, thereby enabling the organization to achieve its desired outcomes (Anthony & Govindarajan, 2007; Merchant & Van der Stede, 2017). Selecting the appropriate base to use for an allocation can be a difficult but necessary step for efficient resource allocation (Zimmerman, 1979, 2020).

Canadian federal healthcare funding is a significant resource allocation to the provinces. The federal government (central unit) allocates funding to the provincial governments (decentralized units), which rely on this funding to maintain their healthcare systems and deliver services needed by constituents. The current practice involves allocating revenues on an equal, per capita basis to all of the provinces. Yet this practice may not allocate enough revenues to provinces, as different provinces have different population structures, including age and thus costs. If the funding allocation is using a base that does not reflect actual healthcare needs or expenditures, provinces may be unable to provide adequate healthcare services for their constituents. Thus, it is important to consider if the federal allocation of revenues is enough to help provinces provide healthcare services. Specifically, should the CHT be modified to incorporate the healthcare cost-needs? Questions like these are used to guide the methodology and analysis of this thesis.

2.4 Existing Literature and Literature Gap

A literature review was conducted showing that previous studies have examined federal healthcare funding arrangements within Canada (Beddard et al., 2000; Eyeles et al., 1991; Kephart & Asada, 2009; Marchildon & Mou, 2014; McIntosh et al., 2010). Beddard et al. (2000), Eyeles et al. (1991), and McIntosh et al. (2010) studied needs-based funding arrangements at a provincial level. Beddard et al. (2000) studied utilization-based and needs-based healthcare funding in the province of Ontario, arguing that healthcare funding to provincial health regions would change if population features such as age, gender, and other needs were used in the allocation. Eyeles et al. (1991) suggested that the Ontario Ministry of Health adopt a needs-based approach in allocating funds to provincial health regions. McIntosh et al. (2010) assessed funding at the provincial level and conducted a comparative analysis of needs-based allocations in five provinces. None of these studies considered accountability in the analysis.

Kephart and Asada (2009) and Marchildon and Mou (2014) assessed healthcare funding across Canada. Kephart and Asada (2009) compared needs-based funding with equal per capita funding. This study used two sets of needs indicators. The first set used only demographic indicators, which involved age and sex. The second used the demographic indicators of age and sex, as well as socioeconomic and health status indicators. This empirical study concluded that, across Canada, different provinces experience different healthcare needs, which impacts funding. Marchildon and Mou (2014) proposed needs-based funding arrangements for the CHT. Looking at all 10 provinces, the authors studied why and how the CHT should incorporate the needs-based indicators of an aging population and geographic dispersion into the allocation.

Recently, Béland and Tombe (2023) examined federal healthcare funding and proposed several options, one of which incorporated age into the allocation of the CHT. The authors also briefly discussed how each option affects accountability, along with other criteria (Béland & Tombe, 2023). Their paper does not discuss empirical evidence regarding indicators associated with healthcare expenditures.

There are also studies that focus on the nature of Canadian fiscal federalism, discussing characteristics and potential challenges for federal funding arrangements (Béland et al., 2020; Hanniman, 2020; Joanis, 2018; McAllister, 2010; Wallner, 2010). Wallner (2010) notes that despite the lack of national standards for education, a provincial policy area, the funding and outcomes of education policy are not very different across provinces. One possible reason is the

societal pressure on provinces from citizens to maintain relative similarities in funding and educational outcomes (Wallner, 2010). Another possible reason is the largely unconditional nature of Canada's federal funding arrangements, which provide provinces with autonomy over spending decisions (Wallner, 2010).

McAllister (2010) studied the redistributive function inherent in Canadian fiscal federalism, which is intended to foster equity across Canada. However, this redistributive function comes at the expense of some provinces when a province contributes more to the federal government than what is redistributed back (McAllister, 2010). McAllister (2010) suggests two possible reasons for this: one is the distribution of House of Commons and Senate seats, which provides uneven representation of some provinces in these institutions. A second, and more likely reason is the "consensus among political and bureaucratic elite culture" (McAllister, 2010, p. 253). During the post-World War Two period, there was a federal vision for social programs, but after that period federal intervention was largely reduced to its spending power and redistributive function (McAllister, 2010). The uneven redistribution in the federation has been maintained to the present day. Successive governments have treated provinces differently through programs and transfers, for instance Equalization and Employment Insurance (McAllister, 2010).

Joanis (2018) analyzed Canadian federal transfers using a second-generation perspective of fiscal federalism, which assumes that politics impact federal transfers (Joanis, 2018). This is in contrast to first-generation fiscal federalism, where one assumes that a government pursues public welfare maximization and transfers should be allocated according to need and not based on politics (Joanis, 2018). The results of this study, which used federal transfer and election data from 1982 to 2012, support the premise of a second-generation fiscal federalism, as this study found a correlation between federal transfers and a province's political support for the federal government in power (Joanis, 2018). These results show that it is important to understand the role politics can have on federal transfers and be aware of this when designing a funding arrangement (Joanis, 2018).

Finally, fiscal federalism challenges in a post-pandemic environment cannot be ignored. Béland et al. (2020) note that, prior to COVID-19, some provinces were discontented with fiscal federalism arrangements within the Canadian federation. Beyond this tension lie other challenges, notably an aging population, and the lack of responsive federal funding to meet

provincial needs (Béland et al., 2020). Hanniman (2020) suggests that the pandemic's long-term effects coupled with Canada's high subnational debts could be at the forefront of federal and provincial arrangements. At 40% in 2019, Canada's gross subnational debt to GDP ratio, "was easily the highest in the world," and one policy option to help provinces is to increase federal transfers both in the short and long term (Hanniman, 2010, p. 279).

None of the studies provided an in-depth discussion of the implications of federal funding on democratic accountability in a federation. Nor did they use resource allocation concepts from the field of management. Thus, there is a literature gap to fill. This thesis addresses the gap by studying federal healthcare funding from an accountability perspective, providing empirical evidence for the need for a modified CHT formula, while also incorporating federalism literature and resource allocation theories.

Chapter 3 Methodology

This chapter provides the methodology of this thesis. As the federal government can decide what general trend indicators related to healthcare expenditure to consider when making funding decisions, this thesis first seeks to understand the association between general trend indicators and healthcare expenditures using multiple regression modeling. Based on the final regression results, this thesis then constructs a needs-based formula to determine a CHT top-up payment using coefficients generated from the multiple regression model results.

3.1 General Trends Related to Healthcare Expenditure

This thesis surveyed empirical studies and government publications related to general trend indicators associated with healthcare expenditure. For this thesis, the term ‘trend’ is, “taken as the tendency over the whole data domain that presumably will continue into the future when new observations become available” (Wu et al., 2007, p. 14899). That is, a trend applies to most people and the trend will likely continue to the future periods. According to the literature review, some general trend indicators that are associated with healthcare expenditures are as follows: population aging (Colombier, 2018; Criveli et al., 2006; Di Matteo, 2005; Koenig et al., 2002; Lopreite & Mauro, 2017; Van Elk et al., 2010; Vrhovec & Tajnikar, 2016); economic growth (Di Matteo & Di Matteo, 1998; Gerdtham et al., 1992; Martin et al., 2018; Newhouse, 1977; Van Elk et al., 2010); technological advancements (CIHI, 2011, 2021) and increasing public expectations (Savage et al., 2021; Taylor, 2003; Wister, 2011; Wister & Speechley, 2015) and demand for healthcare (Di Matteo, 2005; Di Matteo & Di Matteo, 1998; CIHI, 2011, 2021).

An aging population is a general trend indicator associated with healthcare expenditure (Colombier, 2018; Criveli et al., 2006; Di Matteo, 2005; Koenig et al., 2002; Lopreite & Mauro, 2017; Van elk et al., 2010; Vrhovec & Tajnikar, 2016). As previously discussed, the population is aging across Canada. The prevalence of developing and having one or more chronic illnesses increases with age (Public Health Agency of Canada, 2020). Rates of hypertension, cancer, and diabetes increase with age, along with arthritis, osteoporosis, and stroke (Public Health Agency of Canada, 2020). In addition, expectations of an aging population for healthcare in Canada, “may be one of the most significant health care cost drivers” (Wister & Speechley, 2015, p. 237). These expectations may arise from higher levels of education among the public, greater access to

information than previously and consequently deeper knowledge about healthcare services, and increasing demands for value from the taxes paid over a person's lifetime (Wister & Speechley, 2015).

The economy is another general trend indicator related to healthcare expenditures. As economies tend to grow and incomes tend to rise over time, so does healthcare spending. Studies suggest that, because healthcare is a normal good (where demand increases when income increases), income growth is positively correlated with healthcare spending (Di Matteo, 2005; Di Matteo & Di Matteo, 1998; Gerdtham et al., 1992; Newhouse, 1977; Van Elk et al., 2010). Economy of scale also matters for the cost of delivering healthcare. Provinces with larger rural, remote populations incur higher healthcare costs than provinces with more geographically concentrated populations (Martin et al., 2018).

Another general trend indicator associated with healthcare expenditures is the changing technology and expectations and demand for healthcare over time. Technological advancements include research and development, new products such as equipment and drugs, and techniques such as surgical procedures (CIHI, 2011, 2021; Okunade & Murthy, 2002). Newly available treatments, techniques, and products generate public demand (Di Matteo, 2005; Di Matteo & Di Matteo, 1998; CIHI, 2011, 2021). Political decision-makers are faced with the decision to incorporate these treatments, techniques, and products into the healthcare system and expand public coverage (CIHI, 2011, 2021). Increased health literacy, including the awareness of healthcare treatments, techniques, and technologies, increases the expectation of citizens for both the quantity and quality of healthcare services which increases demand (Savage et al., 2021; Taylor, 2003; Wister, 2011).

3.2 Multiple Regression Modeling: Sample and Variable Selection

This thesis uses multiple regression modeling to understand the association between the general trend indicators and healthcare expenditure. The purpose is to determine whether and how these indicators could be included in a modified CHT funding formula. To accomplish this, a multiple regression model is constructed. Based on the multiple regression results, a modified CHT funding formula will be proposed.

The multiple regression model use data from 10 provinces for a 20-year period from 2000 to 2019. The sample begins in 2000 as the data after year 2000 helps capture the more recent

trends. The sample ends in 2019, the final pre-COVID-19 pandemic year. As COVID-19 was a unique healthcare event, this model excluded the pandemic years and focused on the healthcare expenditures over a long and ‘normal’ time period, 2000–2019. This model excludes the three territories because they face unique challenges in providing health services, and they receive an additional federal transfer (Territorial Formula Financing) that addresses the higher cost of providing healthcare services in the territories.

Using the literature discussed in Section 3.1 of Chapter 3 of this thesis, the variables used in the multiple regression model in this thesis represent the following general trend indicators associated with healthcare expenditures: the proportion of the elderly in the population, economic growth, changes in medical technology, increased expectations and utilization of healthcare. This model also controls for the prior year’s per capita provincial healthcare expenditure by including a lagged dependent variable.

Although small, this model captures the general trend indicators that have been identified in the literature. For example, Di Matteo and Di Matteo (1998) studied healthcare expenditures in Canada. The independent variables used in their study are the proportion of those age 65 and over in the population, GDP per capita, federal transfers, and regional dummy variables. Di Matteo (2005) studied healthcare expenditures in Canada and the United States and constructed two models that include only age, income, and time. Regarding age, Di Matteo (2005) found an association between healthcare expenditure and the proportion of the population that is 65 years and older in the total population, especially when considering the 75 and over age group. Focusing on technological advancements, Okunade and Murthey (2002) used a model that had independent variables of per capita income and research and development expenditure.

Table 3.1 describes the dependent variable and independent variables used in this thesis’ model.

Table 3.1: Description of variables

Variable Category and Name:	Description
Dependent Variable:	

HealthExpenditure	Per capita real provincial healthcare spending within a province (expressed in 2019 dollars);
Lagged Dependent Variable:	
LagHealthExpenditure	The prior year's per capita real provincial healthcare expenditure within a province (expressed in 2019 dollars); independent variable.
Aging Population:	
Age_75plus	Proportion of provincial population aged 75 and over within a province (expressed as a percentage); independent variable.
Economic Growth:	
GDP	Per capita provincial real GDP of a province (expressed in 2019 dollars); independent variable.
Technology and Utilization:	
Year	Year time trend for 2000 to 2019; independent variable.

The dependent variable is real per capita provincial healthcare spending expressed in 2019 dollars. The data for the dependent variable were collected from the CIHI (2021) national expenditures data tables. This model includes the prior year's per capita real provincial healthcare expenditure labeled LagHealthcareExpenditure to control for the time dynamic.

The variable Age_75plus is included to indicate the status of population aging in a province. The data are from Statistics Canada's annual population estimates (Statistics Canada, 2023c). The proportion of the provincial population aged 75 and over within a province was selected because healthcare expenditures increase as one ages, especially when one is over the age of 75 (CIHI, 2021; Di Matteo, 2005). Those over the age of 75 have a greater risk of ailments and diseases (Crivelli et al, 2006; Public Health Agency of Canada, 2020).

To incorporate economic growth, this model includes the variable GDP and uses annual provincial GDP data from Statistics Canada (Statistics Canada, 2023b). To transform these total amounts into per capita amounts, Statistics Canada’s annual population estimates data are used and converted from nominal amounts into real amounts using provincial consumer price index (CPI) values from Statistics Canada (Statistics Canada, 2023a).

To control for changes in healthcare technology and utilization, this thesis includes a time-trend indicator: Year.

3.3 Multiple Regression Modeling: Results and Analysis

This thesis conducts the Feasible Generalized Least Squares estimation on a panel data of Canada’s 10 provinces over the period from 2000 to 2019. This estimation method controls for autocorrelation and heteroskedasticity among provinces. The results for the model can be found in Table 3.2.

Table 3.2: Multiple regression results

Variables:

Dependent Variable:
HealthExpenditure

Independent Variables:	Coefficient	z statistic	p value	Standard Error
LagHealthExpenditure	0.42	9.88	0.00	0.04
Age_75plus	62.93	2.40	0.01	26.20
GDP	0.01	7.04	0.00	0.00
Year	52.58	9.60	0.00	5.47
Constant	-104305.5	-9.66	0.00	10794.23

Test Statistics:

N	199
X ²	1158
p value for X ²	0.00

Notes:

- **Bolded coefficients indicate that they are statistically significant at the 5% level.**
-

The multiple regression model includes the indicators of an aging population, economic growth, and technology and utilization. All of these variables have coefficients that are positive and statistically significant at the 5% level. Beginning with the Age_75plus variable, the coefficient suggests that for every one percentage point increase in the proportion of those 75 and over within a provincial population, per capita provincial real healthcare expenditure is expected to increase by \$62.93. This finding is supported by statistics showing that an aging population is associated with a higher per capita healthcare expenditure (CIHI, 2011; 2021).

The coefficient for the GDP variable suggests that for every one dollar increase in the per capita real provincial GDP, per capita real provincial healthcare expenditure is expected to increase by approximately 0.01 dollars, or one cent. This result confirms that healthcare is a normal good but not a luxury good (Newhouse, 1992).

Moving to the time-trend variable Year, the results show that per capita real provincial healthcare expenditure is expected to increase by \$52.58 per year, suggesting that, on average, technology, changing expectations, demand and utilization of healthcare, and other time-varying factors are positively correlated with per capita healthcare expenditure (Blomqvist & Carter, 1997; Di Matteo, 2005; Newhouse, 1992). Finally, the LagHealthExpenditure variable suggests that the prior year's healthcare expenditure is associated with the current year's expenditure.

The multiple regression results show that the proportion of those age 75 and over in the total population, provincial per capita real GDP, and the time trend are associated with per capita healthcare expenditure in provinces. Although this multiple regression model is simple, it captures relevant general trend indicators of healthcare expenditure and provides a starting point for an evidence-based examination of the CHT funding arrangements.

To provide a level of confidence in these results and to determine if the conclusions change when assumptions change, robustness checks are completed: If a larger sample size is used; if a different age rate category is used; and if political dummy variables are included. Table 3.3 reports the results of the alternative multiple regression models: Model A is the baseline model in Table 3.2. Model B is the same as Model A but uses a larger sample (from the years 1977 to 2019 instead of from 2000 to 2019). Using a larger sample that spans 1977 to 2019

provides an opportunity to see if an aging population is associated with healthcare expenditure in the longer term. Model C is a variation of Model A that substitutes the provincial population 75 and over share variable with a 65 and over provincial population share variable. Finally, Model D is a version of Model A that adds dummy variables of whether an election occurred in the year and if the election resulted in a change in government. Adding political variables provides an opportunity to test if political factors affect the model results and should be included. The results of the robustness checks are presented in Table 3.3.

Table 3.3: Robustness checks on the multiple regression model

Variables:	Model A	Model B	Model C	Model D
LagHealthExpenditure	0.42	0.35	0.41	0.42
Age_75plus	62.93	40.00		62.00
GDP	0.01	0.01	0.01	0.01
Year	52.58	42.02	51.18	52.89
Age_65plus			21.32	
Election				18.76
GovernmentChange				-34.72
Constant	-104305.5	-82662.46	-101351.8.	-104914.6
Test Statistics:				
N	199	429	199	199
X ²	1158	6587	1144	1157
p value for X ²	0.00	0.00	0.00	0.00

Notes:

- Bolded coefficients indicate that they are statistically significant at the 5% level.
- “Age_65plus” is a variable representing the provincial proportion of those age 65 and over within a province.
- “Election” is a dummy variable representing if an election occurred during the year (where 1=election occurred).

- “GovernmentChange” is a dummy variable representing if a government changed during a year due to an election (where 1= a change in government).
-

The results for Model B, which uses a larger sample, shows that the coefficient of the population share of the 75 and over variable remains statistically significant. This suggests that the association between population aging and health expenditure likely exists in a longer time period. The results for Model C indicate that when using the population share of the 65 and over variable the Age_65 plus coefficient does not have a statistically significant coefficient. Model D results show that when adding the two dummy variables indicating political conditions, the coefficient of the population share of 75 and over variable is still statistically significant at the 5% level while the two political dummy variables are not.

The multiple regression model that uses the 75 and over age variable found in Section 3.3 will be used for the needs-based formula. This coefficient captures the more recent association between the trend of population aging and healthcare expenditure. This thesis now proceeds with building a modified CHT needs-based formula to calculate potential top-up payments.

CHAPTER 4 A POLICY PROPOSAL FOR HEALTHCARE FUNDING

This chapter proposes a policy option for federal healthcare funding. Based on the results of the multiple regression modeling, a needs-based formula is constructed in order to calculate CHT top-up payments. The desirability and feasibility of this proposed policy option will then be assessed. Finally, alternative policy options will be evaluated.

4.1 Potential Indicators to Consider in CHT Funding Arrangement

Based on the multiple regression results in Section 3.3. of Chapter 3 of this thesis, all the statistically significant independent variables, including age, GDP, and time indicator, are positively correlated with per capita provincial healthcare expenditure.

First, GDP, as represented by the provincial per capita real GDP, is positively associated with provincial healthcare expenditure. The annual escalator of total CHT funding, currently the three-year moving average of national GDP growth rate, directly addresses the pressure of income growth on healthcare expenditure. However, the national GDP growth rate does not fully account for the pressure provincial GDP growth exerts on provincial healthcare expenditures. For example, Alberta has the highest economic growth rates, average CPI, and average wage rate of workers among the provinces (Statistics Canada, 2023a). Therefore, to provide the same amount of healthcare, Alberta needs to pay a higher salary to its healthcare providers than the rest of the country (Courchene, 1970, 1981). Although provincial income growth and wage level influence the cost of providing healthcare, this thesis chose not to consider them in the CHT funding arrangements because these factors could be influenced by provincial governments.

Second, the regression results show a positive year trend in provincial healthcare expenditure. This positive year trend could be due to many time-varying indicators including technological advancements, increasing expectation and utilization of healthcare, significant policy changes, and other indicators. The current CHT funding arrangement does not include a time-trend or time-based consideration, except for periodic adjustments of the annual escalator and allocation formula for the CHT and arbitrary special funding programs, such as pandemic funding, temporary top-up grants, and funding through bilateral agreements. This thesis does not consider a time trend in the annual CHT escalator for now. Including a fixed time trend

encourages growing expectations for healthcare from the constituents. CHT funding arrangements could retain some flexibility and rely on periodic reviews and renewals to address the increasing cost pressure over time. In the future, when data such as technological advancements and increasing expectations for healthcare become available, the ‘year’ variable could be unpacked and investigated further.

Finally, age, as represented by the proportion of those age 75 and over in total provincial populations, is statistically significant at the 5% level and is associated with a coefficient of 62.93. This result means that the proportion of those age 75 and over within a provincial population is positively correlated with the province’s healthcare expenditure, controlling for other indicators. When people become older, they may migrate between provinces (Béland & Tombe, 2023), and the age makeup of a population cannot be easily manipulated by provincial or territorial governments (Marchildon & Mou, 2014). In addition, predicting demographic trends and their impacts on healthcare expenditure in the next five to 10 years is relatively easy compared with predicting a time trend or other healthcare expenditure trends. For these reasons, this thesis proposes to include the age indicator in the CHT funding formula.

Before proceeding, this thesis will discuss why other variables should not be included in a needs-based formula. A needs-based formula should not be policy amendable and thus not include indicators that could potentially be manipulated by provincial governments. For example, while number of physicians are associated with healthcare costs and spending (Di Matteo, 2014), these variables are controlled by provincial governments and can be manipulated. As well, variables such as healthcare providers’ wages are manipulable direct costs and do not represent exogenous healthcare needs. In contrast, while individuals can move freely and provinces can try to attract individuals to reside in a province, demographics are not directly controlled or easily manipulated by provincial governments. Provincial governments could use incentives such as graduate retention tax credits to attempt to attract certain populations to reside within a province, but a person’s location decision depends on many factors including employment and family and a province’s population structure is difficult to manipulate.

A needs-based formula should not include indicators related to lifestyle, such as smoking and obesity rates, because these variables do not represent general trends that apply to everyone and could also be influenced by governments. Population aging is a worldwide trend affecting many countries (World Health Organization, 2022). Aging is a general trend because the

longevity of people, on average, has increased over time and is expected to continue to increase. Intuitively, it is justifiable to include age in a healthcare needs-based formula, as aging is a natural, biological process that is universal (affects everyone). In contrast, lifestyle indicators such as smoking and obesity do not affect everyone. Additionally, considering these variables in a resource allocation formula could generate undesirable outcomes, such as moral hazards. The base used to determine a resource allocation incentivizes certain behaviours and actions (Zimmerman, 2020). An allocation of revenues could be considered a ‘subsidy’ if it encourages an increase in the base unit in the resource allocation formula. For example, if smoking rates are included in a needs-based allocation, provinces with high smoking rates will receive more revenues, rewarding negative behaviour. Thus, a CHT formula should use needs-based indicators that do not subsidize counterproductive behaviours and are difficult to manipulate for reporting purposes. For similar reasons, the needs-based formula does not include the socioeconomic indicators associated with healthcare such as education levels or poverty rates in provincial populations. While these variables are correlated with healthcare expenditure, these factors can be influenced by provincial policies and programs.

Finally, the needs-based formula should not include indicators relating to the rural population within a province. While the rural population, or geographic dispersion, is not easily amendable, it is not a general trend that changes over time, nor does it affect every Canadian like the population aging trend. As well, there is no reliable measurement of geographic dispersion of population (Marchildon & Mou, 2014). Using a strict urban/rural divide measurement may not capture the full effect of geographic dispersion.

In summary, since only age is exogenous, not policy amenable and is a universal, general trend, this thesis considers age as the first and only healthcare need indicator in the federal healthcare funding allocation formula, for now.

4.2 An Age-based CHT Top-up Payment

This thesis proposes an age-based top-up payment to CHT. The formula used to calculate these payments will consider the difference between a province’s share of the senior population and the national average. Table 4.1 shows the share of the population aged 75 and over in each province and in Canada in 2000 and 2019, as well as the change that occurred between these two years.

Table 4.1: Share of population aged 75 and over in the total population, 2000 vs. 2019

Province:	2000	2019	Change
Alberta (AB)	4.02%	5.35%	+1.33%
British Columbia (BC)	5.54%	7.77%	+2.23%
Manitoba (MB)	6.12%	6.70%	+0.58%
New Brunswick (NB)	5.65%	8.58%	+2.93%
Newfoundland (NFLD)	4.79%	7.94%	+3.15%
Nova Scotia (NS)	5.84%	8.43%	+2.59%
Ontario (ONT)	5.06%	7.48%	+2.42%
Prince Edward Island (PEI)	5.82%	7.83%	+2.01%
Quebec (QB)	5.04%	8.19%	+3.15%
Saskatchewan (SK)	6.73%	6.94%	+0.21%
National	5.25%	7.44%	+2.19%

Source: Statistics Canada, 2023c (calculations completed by author)

The national 75 and over age rate in 2019 increased by almost two percentage points since 2000. Several provinces experienced higher growth in the proportion of the 75 and over population as compared to national average growth of people of the same age: British Columbia, New Brunswick, Newfoundland, Nova Scotia, Ontario, and Quebec. New Brunswick, Newfoundland, Nova Scotia and Quebec had the highest share of those age 75 and over in 2019, and their share grew the most from 2000 to 2019. Of all the provinces, in 2019, Alberta, Manitoba, and Saskatchewan had a relatively young population compared with the national average, while Prince Edward Island had roughly the same share of those 75 and over as the national average.

To consider these differences in age structure, this thesis proposes age-based federal healthcare funding on top of the current level of CHT. This age-based CHT top-up payment (*age amount* hereafter) is designed to compensate for the higher per capita cost of providing healthcare in the provinces with a higher proportion of those 75 and over than the national

average. The age amount is calculated as the product of the multiple regression age coefficient (62.93) result in Table 3.2 found in Chapter 3 of this thesis and the difference between a province's share of those 75 and over in a population and the national average in each year. Provinces would qualify for the age amount if their share of people 75 and over was above the national average. If a province's average was equal to or less than the national average, then no age amount would be given. This age amount formula is similar to the current allocation formula of the Equalization transfer, but the factor determining the amount is a province's age structure instead of its revenue generating capacity (fiscal capacity).

Like Equalization, this formula uses a two-year lag, three-year weighted average of the share of the 75 and over population to determine the age structure of each province in each year. For example, in determining the age structure for a province in 2019, this thesis uses its share of the 75 and over population in 2017 (at a weight of 50%), in 2016 (at 25%), and in 2015 (at 25%) and calculates a weighted average. This formula is also used to calculate yearly national rates. Although the resulting age amounts using a two-year lag, three-year weighted average do not address the immediate cost pressures of an aging population, this formula ensures reliability and thus predictability of the age amounts for the provinces.

The formula for the age amount is provided below:

Age amount for province i in year t (in real per capita amount)
= 0, if a province's share of seniors in a population is below the national average;
= $62.93 * (\text{weighted-average Age}_{75\text{plus}}$ in province i for year t - national weighted average of $\text{Age}_{75\text{plus}}$ for year t), if a province's share of $\text{Age}_{75\text{plus}}$ in a population is above the national average

Following the formula, this thesis calculates the age amount for each province for the period of 2000 to 2040. For example, the actual per capita CHT that the province of British Columbia would have received in 2019 was \$954. The weighted average of the share of the population age 75 and over in British Columbia in 2019 is calculated as follows:

- 2017 75 and over rate: 7.44%
- 2016 75 and over rate: 7.33%
- 2015 75 and over rate: 7.25%

The weighted average of Age_75plus for British Columbia in 2019
 $= (7.44 * 0.50) + (7.33 * 0.25) + (7.25 * 0.25) = 7.36\%$

Therefore, the share of population age 75 and over in British Columbia's population in 2019 is calculated at 7.36%, which is above the national weighted average of Age_75plus of 7.05% in 2019. The top-up age amount for British Columbia is thus:

The per capita age amount is $62.93 * (7.36 - 7.05) = 62.93 * (0.31) = \19.51 .

Including the age amount, the per capita federal CHT funding for British Columbia is as follows:

Regular CHT + age amount = $\$954 + 124.87 * (17.5 - 16.5) = 954 + 19.51 = \973.54 .

Figure 4.1 shows the annual per capita age amounts each province would have received from 2000 to 2019. Refer to the *Appendix* for the full calculations for the age amount calculations for each province from 2000 to 2019.

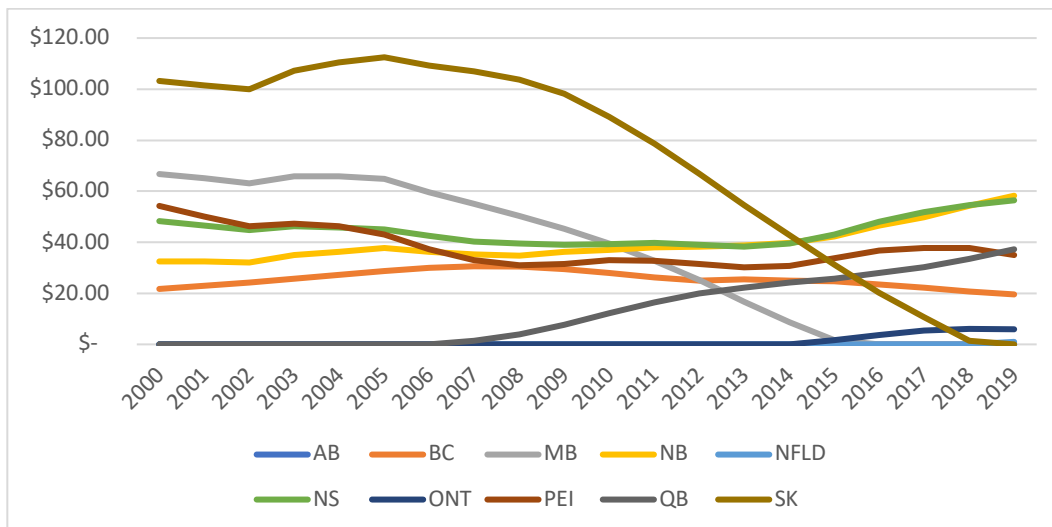


Figure 4.1: Annual per capita CHT top-up age payments (2000 to 2019)

From 2000 to 2019, three provinces would have experienced relatively stable or increasing age amounts: British Columbia, New Brunswick, and Nova Scotia. Because the provinces of New Brunswick and Nova Scotia population experienced rapid aging, they would

have received the largest per capita age payments. For example, in 2000, New Brunswick and Nova Scotia had a similar share to the national average (5%) of those age 75 and over in the population, while in 2019 their share rose to one percentage point above the national average (8% to 7%). New Brunswick had the highest increase to the per capita age amount, moving from an annual per capita top-up payment of \$32.48 in 2000 to \$58.24 in 2019. Nova Scotia would have received a \$48.25 per capita top-up payment in 2000 and a \$56.44 per capita top-up payment in 2019. British Columbia would have had relatively stable per capita payments during this time period, with age amounts fluctuating between 2000 and 2019.

The three provinces of Newfoundland, Ontario, and Quebec would have gone from not receiving to receiving age amounts at some point from 2000 and 2019. In 2015, Ontario received an age amount after not receiving these payments for several years. Quebec switched from not receiving age amounts to receiving these payments in the year 2007. Newfoundland would have received its first age amount in the year 2019, calculated at \$0.99 per capita.

From 2000 to 2019, four provinces would have experienced a reduced per capita age payment: Alberta, British Columbia, Manitoba, Prince Edward Island, and Saskatchewan. These provinces' age structures became more favourable than the national average, so they would have seen per capita amounts decrease. Manitoba would have experienced a decrease in per capita amount from \$66.72 in 2000 to \$0 by the year 2010. Saskatchewan would have received the largest decrease in its per capita annual top-up payment, going from \$103.21 in 2000 to \$0 in 2019. Prince Edward Island would have received age amounts for all the years 2000 to 2019 but would have seen the amounts decrease from an annual per capita amount of \$54.24 in 2000 to \$34.91 in 2019. Alberta was the only province that would not have experienced any change in age amounts because it has had the youngest population profile in the country in the entire 1996–2019 period.

Table 4.2 displays the total annual age amounts for each province.

Table 4.2: Total annual provincial CHT top-up age payments for 2000 to 2019 (in millions)

Year:	AB	BC	MB	NB	NFLD	NS	ONT	PEI	QB	SK
2000	\$0	\$201	\$75	\$24	\$0	\$44	\$0	\$7	\$0	\$105
2001	\$0	\$209	\$74	\$24	\$0	\$43	\$0	\$6	\$0	\$102

2002	\$0	\$230	\$72	\$26	\$0	\$41	\$0	\$6	\$0	\$101
2003	\$0	\$262	\$75	\$27	\$0	\$43	\$0	\$6	\$0	\$107
2004	\$0	\$301	\$75	\$27	\$0	\$42	\$0	\$6	\$0	\$110
2005	\$0	\$344	\$75	\$28	\$0	\$42	\$0	\$5	\$0	\$112
2006	\$0	\$381	\$69	\$27	\$0	\$39	\$0	\$5	\$0	\$108
2007	\$0	\$411	\$64	\$26	\$0	\$37	\$0	\$4	\$10	\$106
2008	\$0	\$433	\$59	\$25	\$0	\$36	\$0	\$4	\$30	\$103
2009	\$0	\$443	\$53	\$27	\$0	\$36	\$0	\$4	\$59	\$97
2010	\$0	\$443	\$47	\$27	\$0	\$36	\$0	\$4	\$94	\$89
2011	\$0	\$441	\$39	\$28	\$0	\$37	\$0	\$4	\$127	\$80
2012	\$0	\$440	\$30	\$28	\$0	\$36	\$0	\$4	\$156	\$69
2013	\$0	\$455	\$20	\$29	\$0	\$36	\$0	\$4	\$177	\$57
2014	\$0	\$470	\$10	\$30	\$0	\$37	\$0	\$4	\$194	\$45
2015	\$0	\$498	\$1	\$32	\$0	\$40	\$22	\$4	\$207	\$34
2016	\$0	\$519	\$0	\$35	\$0	\$45	\$49	\$5	\$226	\$22
2017	\$0	\$551	\$0	\$37	\$0	\$48	\$74	\$5	\$245	\$11
2018	\$0	\$574	\$0	\$41	\$0	\$51	\$83	\$5	\$275	\$1
2019	\$0	\$601	\$0	\$44	\$0.5	\$53	\$83	\$5	\$307	\$0
<hr/>										
Total	\$0	\$2,207	\$845	\$596	\$0.5	\$831	\$313	\$105	\$2,113	\$1,468
<hr/>										

Based on a calculation of the age amounts for each province from 2000 to 2019, the results show that for this time period, the total age amount would have been over \$8.4 billion. All provinces except for Alberta would have received an annual per capita age amount.

This thesis then estimates age amounts provinces would have received from 2020 to 2024. The per capita annual amounts for each province can be found in Figure 4.2. Refer to the *Appendix* for the full calculations for the age amount calculation for each province from 2020 to 2024.

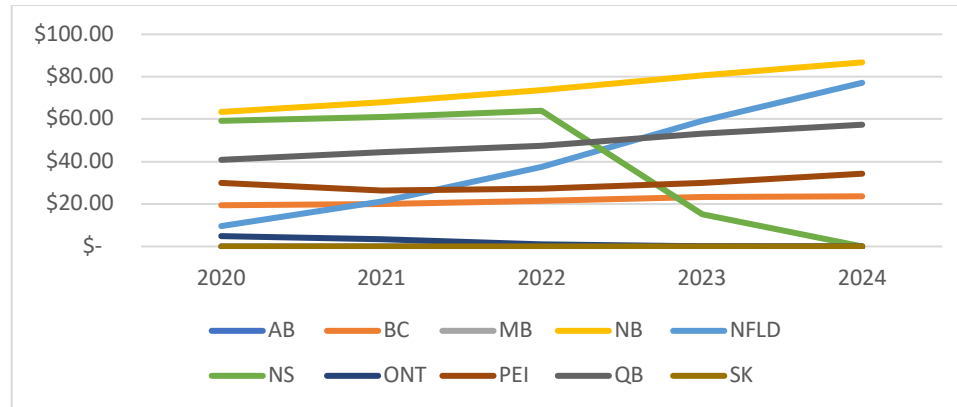


Figure 4.2: Annual per capita CHT top-up age payments (2020 to 2024)

The seven provinces of British Columbia, New Brunswick, Newfoundland, Nova Scotia, Ontario, Quebec, and Prince Edward Island would have received age amounts during this period. Newfoundland’s payment would have increased from \$9.60 in 2020 to \$77.17 in 2024, the largest per capita increase during this time. Nova Scotia and Ontario would have gone from receiving age amounts in 2020 to not receiving any age amount in 2024. These two provinces had 75 and over age rates just under the national rate of 7.82% in 2024, with Nova Scotia having a 7.68% rate and Ontario having a 7.81% rate. The three provinces of Alberta, Manitoba, and Saskatchewan would not have received any age amount during this period.

The total age amount for this period would have been approximately \$3.3 billion. Table 4.3 provides total annual amounts for each province during this forecasted time period.

Table 4.3: Total annual provincial CHT top-up age payments for 2020 to 2024 (in millions)

Year:	AB	BC	MB	NB	NFLD	NS	ONT	PEI	QB	SK
2020	\$0	\$96	\$0	\$48	\$5	\$56	\$68	\$4	\$340	\$0
2021	\$0	\$100	\$0	\$52	\$11	\$58	\$50	\$4	\$373	\$0
2022	\$0	\$110	\$0	\$57	\$19	\$62	\$12	\$4	\$403	\$0
2023	\$0	\$120	\$0	\$63	\$31	\$15	\$1	\$4	\$454	\$0
2024	\$0	\$124	\$0	\$69	\$40	\$0	\$0	\$5	\$494	\$0
Total	\$0	\$552	\$0	\$291	\$107	\$192	133	\$23	\$2,065	\$0

This thesis also forecasted age amounts from 2025 to 2040. This was completed by using Statistics Canada (2023d) population projections. The estimated age amounts for the 10 provinces for the next 15 years are presented in Figure 4.3. Refer to the *Appendix* for the full calculations for the age amount calculation for each province from 2025 to 2040.

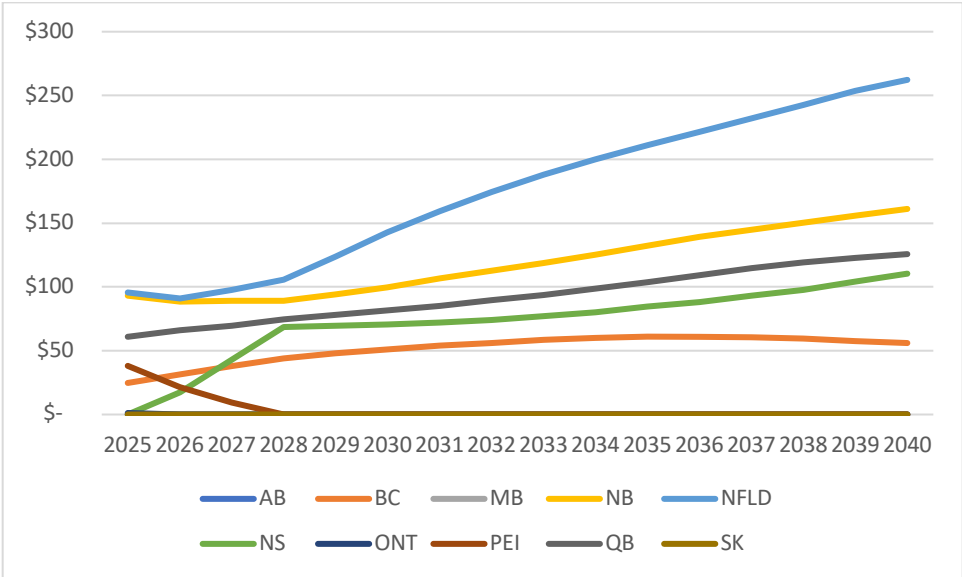


Figure 4.3: Annual per capita CHT top-up age payments (2025 to 2040)

The four provinces of British Columbia, New Brunswick, Newfoundland, and Quebec would receive payments during the entirety of 2025 through 2040, with Newfoundland receiving the largest annual per capita amounts in this entire period. In 2025, Newfoundland’s payment would be \$95.45, growing to \$262.27 in 2040. Population projections estimate that Newfoundland’s 75 and over rate could be over 17% by 2040, the largest share of this age group within a province (Statistics Canada, 2023d). Nova Scotia would receive payments for all years expect for 2025 (when its 75 and over age rate is just under the national rate) while Prince Edward Island would only receive payments for the years 2025 through 2027. The four provinces of Alberta, Manitoba, Ontario, and Saskatchewan would not receive any payments between 2025 and 2040.

The total estimated age amount from 2025 to 2040 is an estimated \$21.9 billion in additional federal healthcare funding. Table 4.4 provides total annual amounts for each province during this forecasted time period.

Table 4.4: Total annual provincial CHT top-up age payments for 2025 to 2040 (in millions)

Year:	AB	BC	MB	NB	NFLD	NS	ONT	PEI	QB	SK
2025	\$0	\$113	\$0	\$75	\$50	\$0	\$0	\$6	\$532	\$0
2026	\$0	\$172	\$0	\$71	\$47	\$17	\$0	\$3	\$577	\$0
2027	\$0	\$208	\$0	\$72	\$50	\$44	\$0	\$1	\$612	\$0
2028	\$0	\$244	\$0	\$71	\$54	\$71	\$0	\$0	\$652	\$0
2029	\$0	\$268	\$0	\$76	\$62	\$72	\$0	\$0	\$684	\$0
2030	\$0	\$289	\$0	\$81	\$72	\$73	\$0	\$0	\$715	\$0
2031	\$0	\$306	\$0	\$86	\$79	\$74	\$0	\$0	\$750	\$0
2032	\$0	\$322	\$0	\$91	\$87	\$77	\$0	\$0	\$786	\$0
2033	\$0	\$335	\$0	\$96	\$93	\$80	\$0	\$0	\$824	\$0
2034	\$0	\$345	\$0	\$101	\$98	\$83	\$0	\$0	\$867	\$0
2035	\$0	\$352	\$0	\$107	\$103	\$87	\$0	\$0	\$913	\$0
2036	\$0	\$354	\$0	\$112	\$107	\$91	\$0	\$0	\$961	\$0
2037	\$0	\$353	\$0	\$117	\$111	\$96	\$0	\$0	\$1,006	\$0
2038	\$0	\$347	\$0	\$121	\$115	\$100	\$0	\$0	\$1,046	\$0
2039	\$0	\$337	\$0	\$125	\$119	\$107	\$0	\$0	\$1,077	\$0
2040	\$0	\$328	\$0	\$129	\$122	\$113	\$0	\$0	\$1,102	\$0
Total	\$0	\$4,701	\$0	\$1,539	\$1,377	\$1,192	\$0	\$11	\$13,113	\$0

In summary, the total age amount from 2000 to 2040 is calculated at over \$33 billion. Table 4.5 lists each the provinces' total amounts for each time period, along with the national total.

Table 4.5: Provincial total age amounts per time period (in millions)

Province:	2000–2019	2020–2024	2025–2040	Total
Alberta	\$0	\$0	\$0	\$0
British Columbia	\$2,207	\$552	\$4,701	\$7,460
Manitoba	\$845	\$0	\$0	\$845
New Brunswick	\$596	\$291	\$1,539	\$2,426
Newfoundland	\$0.52	\$107	\$1,377	\$1,485
Nova Scotia	\$831	\$192	\$1,192	\$2,215
Ontario	\$313	\$133	\$0	\$446
Prince Edward Island	\$105	\$23	\$11	\$139
Quebec	\$2,113	\$2,065	\$13,113	\$17,291
Saskatchewan	\$1,468	\$0	\$0	\$1,468
Total	\$8,479	\$3,363	\$21,933	\$33,775

Table 4.6 summarizes each province’s average annual per capita age amount for each time period.

Table 4.6: Provincial average annual per capita age amounts per time period (rounded to the nearest whole dollar)

Province:	2000–2019	2020–2024	2025–2040
Alberta	\$0	\$0	\$0
British Columbia	\$91	\$22	\$51
Manitoba	\$42	\$0	\$0
New Brunswick	\$38	\$75	\$119
Newfoundland	\$0	\$41	\$175
Nova Scotia	\$45	\$40	\$72
Ontario	\$4	\$2	\$0

Prince Edwards Island	\$43	\$30	\$4
Quebec	\$11	\$49	\$93
Saskatchewan	\$78	\$0	\$0

On an average annual per capita level, Newfoundland would have experienced the largest increase in the per capita average age amounts, going from \$0 in the 2000 to 2019 period to \$175 in the 2025 to 2040 period. This increase reflects the aging population in Newfoundland. Two other provinces would have also seen average annual per capita increases: New Brunswick and Quebec. British Columbia, Nova Scotia, and Prince Edward Island would have received payments but also would have experienced fluctuations in the age amounts (increasing and/or decreasing).

The provinces of Manitoba, Ontario, and Saskatchewan would have gone from receiving age amounts to not receiving any, and Alberta would not have been eligible for an age amount for the entirety of 2000 through 2040. These results reflect the population structure of these provinces, which are younger when compared to the national average.

This thesis acknowledges that the multiple regression coefficient of 62.93 may not be the most accurate to represent the health expenditure implications from an unfavourable population age structure because a multiple regression coefficient depends on the sample, the choice of variables, estimation methods, and other factors. Nevertheless, this thesis has demonstrated that it is possible to consider the different age structures of provincial populations in the federal healthcare funding formula. In the next section, this thesis will discuss the desirability and feasibility of this policy option.

4.3 Desirability of the Age-based CHT Top-up Payment

Incorporating an age-based top-up age payment into the regular CHT would enhance the accountability associated with healthcare funding and is efficient. As discussed in Section 1.2 in Chapter 1 of this thesis, accountability in healthcare is weak in Canada because the line of responsibilities between the two levels of governments is blurred. The pressures that an aging population exerts on healthcare incentivize both levels of government to engage in a blame-game, with each trying to unload the blame on the other. From 2012 to 2023, most Canadians

believed that funding for healthcare was inadequate (Jacques & Perrot, 2023). Additionally, less affluent provinces with older populations were more likely to suggest that Canadian healthcare is in crisis (Jacques & Perrot, 2023). Provinces often blame the federal government for not providing sufficient funding to help them deal with increasing healthcare expenditures. The age-based CHT top-up amount would allow the federal government to convey to Canadians that it is taking such concerns into account. This should help minimize the ‘blame-game’ because federal healthcare funding would specifically address the cost pressures from an aging population. Provincial governments would then be expected to spend the top-up payment in accordance with the needs of constituents, who could then evaluate how and where a provincial government is spending the funds.

Second, the needs-based formula is flexible. The proposed age needs-based formula automatically adjusts the payments to each province based on variations and the changing trends in population aging. In the future, when new trends or relationships emerge, the formula could be modified and include other variables. Thus, the formula can be revisited and revised.

Third, the policy option proposed in Chapter 4 provides an opportunity to determine if needs-based funding is welcomed by the public and provinces. As these age amounts are in addition to the current CHT, all provinces would retain the equal per capita CHT allocation. This design should not only help remedy potential strife from provinces that would not receive age amounts but also provides a chance to assess the public desire and/or acceptance for needs-based funding. If the public is receptive towards this type of needs-based funding, the federal government could modify the formula and expand needs-based allocations in the future.

Finally, a transparent funding formula would enable constituents to understand the inputs and outputs of the formula. An important ingredient for accountability is transparency (Koppell, 2005). Linked to transparency is the accessibility of information. For the age-based CHT top-up payment, the federal government would provide the needed data and information about the formula to provincial governments and constituents. In this way, constituents would understand how the allocation is determined and would be able to monitor the decisions and outcomes of the two levels of governments: how the federal government calculates the age amounts (and the corresponding total amounts) and how the provincial government then spends the money. This information should help voters to decipher whether healthcare dissatisfaction is due to a lack of

federal funding or provincial mismanagement. Thus, voters could be able to assess whether they are pleased or displeased with the age amounts provided from the federal government.

As well, in knowing that the federal government is providing age amounts to provincial governments, voters could evaluate how this funding is being spent and vote to reward or punish a provincial government. In addition, the formula for the top-up age amount is consistent with the efficiency criterion of funding arrangements. The age amount improves the adequacy of healthcare funding and uses an appropriate base for the resource allocation.

It is important to recognize that democratic accountability depends on informed and rational voting decisions by voters. In reality, voting decisions could be determined by issues other than healthcare or accountability. Voter behaviour could also be impacted by such factors as partisanship and ideology (Campbell et al., 1960) and regional and other cleavages (Gidengil et al., 1999; Kay & Perrella, 2012). Additionally, media attention, voter knowledge, and issue priority can also influence voting behaviour (Cutler, 2017). While voters would have access to the formula's inputs and outputs, voters may not necessarily seek this information or fully understand the information. Additionally, the amount of media attention as well as issue importance within the public could also impact the effect of the needs-based formula on voting behaviour. Finally, a feature of Canada's representative democracy is that the elected official may not be who an individual voted for and there may not be better alternative representatives to choose

This thesis acknowledges the limitations of representative democracy and voting behavior on democratic accountability. The proposed age-based top up amount is one mechanism to help voters with their decision-making.

In summary, this thesis's estimation results in Table 3.2 of Chapter 3 show that a province's age structure is a significant indicator associated with healthcare expenditure. An age-based top-up amount would help provincial governments address the cost pressure of an aging population. This resource allocation is efficient because the base used to determine funds would be an actual healthcare need indicator. If both the federal and provincial governments formally recognized the age structure in the funding model, they would be more likely to allocate resources to programs and services that an aging population needs and achieve the intended outcomes (Zimmerman, 2020). In addition, this funding method would not generate serious

moral hazard problems because it is difficult for provinces to control the age structure of their population as opposed to other indicators such as wages and other supply-side costs.

4.4 Feasibility of the Age-based CHT Top-up Payment

An age-based CHT top-up payment is an operationally and politically feasible policy option. Policymakers must consider which change is both logical and feasible, in other words has “the best chance of coming about” (Lawford-Smith, 2012, p. 255). When considering federal healthcare contributions, it is critical to consider whether a change to an allocation will be accepted by stakeholders. These deliberations involve considering constraints that may threaten a policy’s popularity, such as fiscal, institutional, political, and/or cultural considerations (Lawford-Smith, 2013).

First, the federal government is anticipated to be in a fiscal position that allows it to provide healthcare funding and help provinces provide healthcare services (Béland & Tombe, 2023), such as these age amounts. During the time period of 2018 to 2090, projected federal revenue to GDP growth is 3.7% per year while average annual provincial revenue to GDP growth is 3.3% to 3.4% (Tombe, 2020). On the expenditure side, provincial expenditure to GDP is 3.8% to 2040 and around 3.5% after 2040 (Tombe, 2020). As a result of revenue to expenditure imbalances, provincial “deficits will rise and debt will mount” (Tombe, 2020, p. 1104). The annual primary deficit to GDP ratio for provinces (on average) is predicted to be 14% in 2030 and 26% in 2090 (Tombe, 2020). The picture for the federal government is different: the primary deficit to GDP ratio is forecasted to be around -0.4% in 2030 and -2.5% in 2090, with the negative values indicating a primary surplus position (Tombe, 2020).

The age amounts could be a feasible and sustainable funding option for the federal government. The proposed age amount is, on average, about 1.5% of the annual CHT amount. Forecasted total CHT amounts from 2025 to 2028 is \$235.1 billion (Parliamentary Budget Office [PBO, 2024]), while the age amount total is around \$3.7 billion. This amount is relatively small compared to the CHT but should help provinces to provide healthcare services for an aging population. For example, in 2019 New Brunswick had the highest proportion of those 75 and over in its population and would have received an age amount of over \$44 million. This additional funding is about 1.76% of New Brunswick’s 2019 provincial healthcare expenditure, which totaled around \$2.5 billion (New Brunswick, 2020).

In addition, the CHT is on track to grow more slowly than healthcare expenditures (Tombe, 2020). Healthcare spending per capita could rise 21% between 2021 and 2050, amounting to an annual increase of \$40 billion in current dollars (Béland & Tombe 2023). In particular, the “incremental costs” due to an aging population are overwhelmingly imposed onto provincial budgets (Tombe, 2020, p. 1086). Thus, to ease the stress of healthcare costs on provincial budgets and address the “imbalance in between the two orders of the government” (Tombe, 2020, p. 1087), the federal government faces pressure to spend more on healthcare.

Second, an age-based top-up payment would be accepted by voters because it acts like an Equalization in healthcare, echoing the long-standing Equalization policy. The Equalization policy is a federal funding arrangement that assesses provincial revenue-generating capacity from taxes (fiscal capacity) and allocates funding to provinces with a lower than national average fiscal capacity (Béland et al., 2017). Eligible provinces would receive a transfer payment while ineligible provinces would not be penalized; they would simply not receive a payment (Béland et al., 2017). A CHT needs-based, top-up age payment functions like Equalization in healthcare – it compensates provinces with higher healthcare costs and does not punish the others. The difference is that the top-up age payment assesses and compares healthcare needs (and related costs) across provinces instead of fiscal capacity. As Canadians already have experience with the regular Equalization policy, it would be relatively easy for Canadians to understand and appreciate another Equalization funding arrangement.

Third, provincial governments are likely to support Equalization in healthcare. As per the estimation in summary Tables 4.5 and 4.6 in Chapter 4 of this thesis, all but one Canadian province would receive top-up payments at some point from 2000 to 2040. Thus, an overwhelming majority of provinces would benefit from the inclusion of the age amount to the CHT. As well, the age-based CHT top-up payment helps with the added cost-pressure due to an aging population. As provinces would continue to receive the equal per capita base CHT, the expectation would be that provincial governments allocate the age amounts towards healthcare services that are needed to support an aging population. Thus, the age amount is additional money to help balance between healthcare demand and supply-side issues and help ease the general healthcare cost-pressure faced by provincial governments. with the healthcare demand and supply-side issues that go beyond an aging population.

Fourth, the age-based top-up formula is predictable. Because the funding formula uses a two-year lag, three-year weighted average and the demographic data are available and accessible, provinces and constituents could predict the funding they would receive, which offers reliability. The needs-based funding formula would also allow provinces to estimate the amount of funding and help provinces with program planning and service delivery.

Fifth, this funding arrangement respects the division of powers within the *Constitution Act, 1867* while also allowing the federal government to uphold its responsibilities within the *Constitution Act, 1982*. Federal encroachment into areas of provincial jurisdiction receives criticism from provinces who want constitutional boundaries and provincial autonomy respected (Brock, 2008). By adhering to its funding role, the federal government is upholding its funding responsibilities and providing provinces with the revenues to meet their unique challenges and/or needs (Brock, 2008). This enables the federal government to play a role in helping provinces tackle policy challenges by offering resources, “but without encroaching on provincial autonomy and jurisdiction” (Brock, 2008, p. 157). This funding formula also avoids ‘asymmetrical federalism,’ whereby there is different treatment for different provinces (Brock, 2008). This needs-based funding formula treats all provinces equally, as the formula responds to aging populations within provinces and neither gives preferential treatment to a specific province nor certain provinces an opportunity for selective negotiations.

Sixth, using age as the base in the allocation formula will help make provinces feel like this is a fair allocation and be receptive to this funding arrangement. While Canadians have experience with Equalization policy, there is contention surrounding the inclusion and treatment of natural resources (Béland et al., 2017; Courchene, 2004). Provinces have constitutional authority over resources, and resource-rich provinces may feel that they are unfairly ‘punished’ for the revenues generated from resource-extraction decisions (Béland et al., 2017). This contention is further fueled by how resource revenues are treated in the Equalization calculation. For instance, Hydro-Quebec can sell electricity to Quebec residents at below-market prices and this price is then captured in the Equalization calculation (Béland et al., 2017). However, if these prices reflected actual-market value, Quebec could see its equalization payments decrease (Béland et al, 2017). In contrast, age is an exogenous variable that is difficult to manipulate and is a general national trend indicator associated with healthcare expenditure. The age amounts

include the reliability features of Equalization while lessening the potential for contention and resistance.

Finally, using a transparent formula should also keep politics out of the age-amounts. There was a correlation between federal transfers and a province's support for the federal government in power, and this correlation was more pronounced in social transfers versus equalization, as social transfers were more elastic than the formula-driven Equalization policy (Joanis, 2018). The age amount, like Equalization, uses a transparent formula in the calculation and this feature should help reduce the potential for politics to impact the payment as the process and amount of money is dependent upon an exogenous variable (age) that is difficult to manipulate.

For these reasons, including a needs-based formula to calculate age-based CHT top-up payments is a politically feasible policy option. The federal government is in a fiscal position to support these payments, especially when compared to the challenges provinces face now and in the future regarding their aging population. The equalization features of this policy option mimic the long-standing Equalization policy, which provides familiarity and credibility. The provinces should also welcome this formula and age amounts: most provinces receive an age amount, the formula provides reliability and transparency, the payments respect the constitutional boundaries, and mechanics of the formula assist in keeping politics from affecting the allocation process.

4.5 Policy Alternatives

Other than the age-based top-up amount, there have been several alternative policy proposals for federal healthcare funding. One option is to increase the escalator for total CHT and maintain the current equal per capita allocation of CHT among provinces. The current escalator, the nominal national GDP growth rate, captures potential cost pressures associated with growing economies. However, as Canada's population ages, the share of the working-age population in the total population is set to decrease over the next several decades, and this trend could lower the GDP growth rate (Béland & Tombe, 2023). As well, there are differences in both provincial expenditures and revenues and population demographics across the provinces (Bird & Tarasov, 2004; Boadway & Watts, 2000). A blank increase to the annual escalator does not take into account such disparities and could undercompensate provinces with insufficient revenue capacity, high expenditures, and an aging population. Thus, increasing the escalator does not

address the horizontal fiscal imbalances among provinces or the lack of accountability in healthcare.

Another policy option is to provide additional healthcare funding through bilateral agreements. However, these agreements require recurring negotiations between the federal government and each provincial government, incurring both a monetary and time cost. In contrast, a top-up payment that uses a formula would not require the federal government to negotiate with each province. An additional problem with bilateral agreements is that they are largely decided by the federal government, and constituents perceive the funding as a stand-alone healthcare funding separate from the CHT. Therefore, bilateral agreements do not help strengthen accountability in the CHT.

An additional policy option is to implement federal healthcare programs that provide coverage for specific healthcare needs. For example, the federal government has recently engaged in new national programs, including the Canada Dental Care Plan (CDCP) and the National Pharmacare plan (Canada, 2024a, 2024b). According to the Parliamentary Budget Office (PBO), the annual cost of CDCP to the federal government is around \$3 billion in 2023–2024 and the total cost for the five years from 2023 to 2027 is estimated to be around \$10.1 billion (PBO, 2023b). The estimated cost of a national pharmacare plan to the federal government is to be \$1.9 billion between 2024 and 2029 (PBO, 2023a). Table 4.7 shows the estimated annual costs to the federal government for each of these programs alongside the age amounts.

Table 4.7: Annual program costs: Pharmacare, CDCP, and age amount (in millions)

Year:	Pharmacare*	CDCP*	Age Amount
2023	-	\$2,798	\$689
2024	\$335	\$1,202	\$726
2025	\$355	\$1,762	\$790
2026	\$376	\$1,618	\$884
2027	\$398	\$1,751	\$985
2028	\$422	-	\$1,094

Notes:

- PBO has estimates for Pharmacare* for years 2024 through 2028 and estimates for CDCP* for years 2023 until 2027.

Sources: Office of the Parliamentary Budget Officer, 2023a, 2023b

While these two national programs should help Canadians, they generate provincial concerns and do not address the accountability problem. National programs that provide services and benefits create expectations but also risks: If the federal government reduces support for programs, provinces may have to cover the difference due to constituent expectations for these services (Fierlbeck, 2023). Thus, there can be a hesitancy on behalf of provincial governments (Bellefontaine, 2024). In contrast, a top-up age payment is not fixed to a national program and expectations around it; rather, the money can be spent at the discretion of each province and allocated towards the needs of a province. Federal programs could also blur the lines of responsibility as constituents can view the federal government as having a management role within healthcare. The federal government adhering to a funding role helps clarify the responsibilities each level of government has: The federal government provides funding, and provinces are left to determine how funds are spent. By adhering to these roles, constituents should be better able to hold each level accountable.

Another policy option is tax-point transfers from the federal government to provincial governments (Boessenkool, 2013; Sethia, 2021). For instance, the federal government could elect to transfer all or a portion of government sales tax (GST) points to the provinces, which would allow provinces to increase their own provincial sales tax (PST). This would shift all or at least a significant amount of accountability for healthcare onto provincial governments. However, this presents several challenges. First, transferring federal tax points could result in ‘horizontal tax competition’ between provinces. Second, equity concerns could arise because poorer provinces may lack fiscal capacity in some or all tax categories compared with wealthier provinces (Gillis, 2019). Third, the tax-point transfer does not necessarily lead to revenue for healthcare. The federal government has limited enforcement options (Gillis, 2019). Provincial governments could accept a federal GST tax-point transfer and decide to not increase or reduce PST rates for political purposes (Gillis, 2019). As a result, some provinces may use these tax points to increase PST rates while others may not to do so.

As well, despite tax-point transfers in the past, provinces still demand more federal healthcare funding. In 1976 the federal government decreased its personal and corporate tax rates in order to provide provinces with this tax room (Canada, 2014; Gauthier, 2011). During the EFP period, healthcare costs rose above inflation and GDP growth, provinces shifted healthcare service deficiencies onto the federal government, blaming decreases in federal funding (Jordan, 2008). However, the federal government shifted blame back onto the provinces, acknowledging the tax-point transfers given to provinces and blaming provinces for using the tax-point revenues on non-healthcare related endeavours (Jordan, 2008). Nonetheless, provincial governments pressured the federal government for more funding in the past decades (McIntosh, 2004). This suggests that tax-point transfer does not bolster accountability but creates moral hazards from provincial governments and encourages blame-games. It also suggests that federal transfer payments are a better mechanism to help provincial governments cope with healthcare costs.

These alternative policy proposals— a blank increase to the CHT, bilateral agreement funding, new national programs such as CDCP and Pharmacare, and a tax-point transfer — represent different views of the federal and provincial governments on their own role and the role of the other government. The provincial governments want the federal government to remain a generous funder of healthcare, while the federal government prefers an active role in steering the direction of healthcare. Since the federal government has spending power, in the past several years most of the additional federal healthcare funding support has been through bilateral agreements and ad hoc adjustments to the CHT. Some provinces have complained about the lack of consultation with provincial governments. A transparent and needs-based approach to federal healthcare funding, such as the age-based amount that this thesis proposes, would help clarify the responsibility of each level of government and improve the federal-provincial fiscal relationship.

Before concluding, it is also important to discuss the rationale for omitting strict conditions to the proposed age-based CHT top-up payment. The CHT has operated without stringent conditions, except for the five general provisions under the *Canada Health Act, 1984* (Canada, 1984). Due to precedence and political feasibility concerns, attaching strict conditions to a CHT top-up payment is not recommended, as it would likely encounter political resistance from the provinces. As well, due to Canada's highly decentralized federation, any conditions attached would have to be specific, measurable, and have the required reporting procedures, adding complexity and costs. Nonetheless, in the future, this payment could also be a conditional

transfer with measures attached that help promote performance accountability (Brinkerhoff, 2004).

CHAPTER 5 CONCLUSION

This thesis has examined why and how federal healthcare funding arrangements could be modified. Federal healthcare funding allocation has implications for the quantity and quality of healthcare services that Canadians receive, federal and provincial politics, and federal-provincial intergovernmental relationship. Using a multiple regression study, this thesis found that the indicators of age, GDP, and time are associated with provincial healthcare expenditures. Of the three indicators, there are strong reasons to address age in federal healthcare funding: Population aging has been a general trend indicator associated with healthcare expenditures; provinces are experiencing different degrees of population aging; and the provinces cannot control their own age structures. This thesis found that if the cost implications of unfavourable age structures were accounted for, most provinces would receive an age amount to top-up their regular CHT. Using federalism, resource allocation, and other literature, this thesis has argued that adding an age-based top-up payment to the CHT would help improve the adequacy, fairness, and efficiency of federal healthcare funding; strengthen democratic accountability; and is operationally and politically feasible.

Although previous studies have examined a needs-based federal healthcare funding formula, few have paid attention to the accountability implications of healthcare funding arrangements in a federation. The current federal healthcare funding arrangements do not directly address the increasing and uneven cost pressures of an aging population, leaving the two levels of governments in a perpetual blame-game. The consequence of a blame-game between governments is borne by Canadians, who pay for public healthcare but have insufficient information to hold any government accountable for the quantity and quality of the services they receive.

This thesis has demonstrated that an age-based CHT top-up payment can be designed and estimated. It argues that this top-up payment should be included to enhance government accountability to Canadians. To ensure provinces have the same capacity to provide comparable services, they should be compensated for their disadvantageous characteristics, such as an aging population. Canadian Equalization policy largely addresses these disparities on the revenue side, leaving the disparity in healthcare expenditures unaddressed. Accountability would be improved with an age-based top-up payment because the payment uses a base related to healthcare

expenditure. As well, accountability would be strengthened because the formula used to determine the payment would both be transparent and help clarify the boundaries of governmental responsibility. With clear and accessible information, voters could better hold both levels of governments accountable through elections and other mechanisms. The age amount calculations and amounts would be available to voters. Thus, voters could evaluate whether the federal government is providing enough funding to help compensate for aging populations and if receiving provinces are allocating funds to the needs of the province.

There are several limitations to this thesis. First, the final multiple regression model is simple and could be incomplete. This modeling is consistent with the literature and focuses on the general trends that are associated with aggregate healthcare expenditures at this moment and for which reliable data are available. Based on the empirical results, the thesis constructs a simple, clear funding formula. Other indicators, though not trends, could be incorporated in the future funding formula. For example, geographic population dispersion in a province could be associated with healthcare expenditure and the variable cannot be easily manipulated by provincial governments. As well, the year variable found in the regression model in Chapter 3 is statistically significant. Future research could be done regarding if and how this variable could be unpacked and included in a needs-based formula.

Second, this study relied on quantitative methods and did not consider qualitative methods such as interviewing and/or surveying elected government officials and/or bureaucrats. Future research could be conducted along these lines to assess if and how age-based CHT top-up payments and/or a transparent funding formula would enhance accountability. This research could be completed within the realm of electoral studies and assess if and/or how this transparent funding allocation formula impacts voter decision-making alongside other factors such as partisanship, issue salience, and voter knowledge. Research could also be done on how provinces are spending federal funding and whether these spending decisions are strengthening and/or achieving accountability in terms of outcomes. Qualitative research that assesses the public's enthusiasm for needs-based funding could also be conducted.

Finally, more analysis on the migration of people between provinces is warranted. While this paper discussed the healthcare cost implications for the provinces receiving seniors, it did not discuss the potential benefits from an inflow of seniors. Seniors moving to and residing in a province contribute to the province's tax base through consumption, property, and/or other taxes.

A thorough analysis could be conducted that assesses the costs and benefits of inter-provincial migration of seniors.

Modifying federal healthcare funding is imperative due to an aging population, growing healthcare expenditures, and ongoing healthcare crises. A top-up age-based payment to the CHT is a politically feasible option that would help support the healthcare system and enhance the democratic accountability associated with billions of dollars of healthcare funding. The results of this thesis can help the federal and provincial governments in Canada find a feasible pathway for healthcare funding and healthcare in the future.

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Publications.

APPENDIX: Calculations

Table A.1 Alberta

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	3.82	4.82	-1.00	62.93	-63.11	0.00	2,850,778	\$ -
2001	3.89	4.94	-1.05	62.93	-66.32	0.00	2,908,575	\$ -
2002	3.96	5.06	-1.10	62.93	-69.30	0.00	2,965,039	\$ -
2003	4.21	5.39	-1.18	62.93	-74.20	0.00	3,018,277	\$ -
2004	4.37	5.61	-1.24	62.93	-77.92	0.00	3,079,791	\$ -
2005	4.54	5.83	-1.29	62.93	-81.32	0.00	3,138,167	\$ -
2006	4.63	5.95	-1.32	62.93	-83.06	0.00	3,197,208	\$ -
2007	4.70	6.06	-1.36	62.93	-85.32	0.00	3,266,317	\$ -
2008	4.76	6.18	-1.41	62.93	-88.90	0.00	3,350,826	\$ -
2009	4.79	6.28	-1.49	62.93	-93.80	0.00	3,442,874	\$ -
2010	4.80	6.38	-1.57	62.93	-98.97	0.00	3,531,823	\$ -
2011	4.80	6.44	-1.65	62.93	-103.57	0.00	3,616,999	\$ -
2012	4.81	6.51	-1.70	62.93	-106.74	0.00	3,684,754	\$ -
2013	4.84	6.57	-1.73	62.93	-108.96	0.00	3,747,285	\$ -
2014	4.87	6.64	-1.77	62.93	-111.56	0.00	3,817,552	\$ -
2015	4.87	6.70	-1.83	62.93	-115.37	0.00	3,906,400	\$ -
2016	4.86	6.77	-1.91	62.93	-120.33	0.00	4,005,714	\$ -
2017	4.87	6.85	-1.98	62.93	-124.43	0.00	4,088,410	\$ -
2018	4.92	6.94	-2.02	62.93	-127.22	0.00	4,155,065	\$ -
2019	5.01	7.05	-2.05	62.93	-128.71	0.00	4,205,688	\$ -
TOTAL								\$ -
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	5.12	7.18	-2.06	62.93	-129.66	0.00	4,258,428	\$ -
2021	5.25	7.33	-2.08	62.93	-130.69	0.00	4,316,132	\$ -
2022	5.37	7.45	-2.08	62.93	-131.15	0.00	4,368,960	\$ -
2023	5.52	7.62	-2.10	62.93	-131.97	0.00	4,408,283	\$ -
2024	5.71	7.82	-2.12	62.93	-133.17	0.00	4,465,202	\$ -
TOTAL								\$ -

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	5.87	8.00	-2.14	62.93	-134.44	0.00	4,583,251	\$ -
2026	6.02	8.35	-2.33	62.93	-146.80	0.00	4,615,345	\$ -
2027	6.17	8.64	-2.47	62.93	-155.57	0.00	4,679,023	\$ -
2028	6.34	8.97	-2.63	62.93	-165.37	0.00	4,713,750	\$ -
2029	6.53	9.23	-2.71	62.93	-170.29	0.00	4,782,700	\$ -
2030	6.74	9.51	-2.77	62.93	-174.30	0.00	4,851,600	\$ -
2031	6.98	9.81	-2.82	62.93	-177.60	0.00	4,920,425	\$ -
2032	7.25	10.12	-2.86	62.93	-180.25	0.00	4,988,975	\$ -
2033	7.55	10.44	-2.89	62.93	-181.89	0.00	5,056,975	\$ -
2034	7.86	10.77	-2.91	62.93	-183.24	0.00	5,122,675	\$ -
2035	8.17	11.10	-2.93	62.93	-184.18	0.00	5,186,675	\$ -
2036	8.47	11.42	-2.94	62.93	-185.23	0.00	5,248,975	\$ -
2037	8.78	11.74	-2.96	62.93	-186.23	0.00	5,310,450	\$ -
2038	9.07	12.05	-2.98	62.93	-187.37	0.00	5,371,175	\$ -
2039	9.35	12.34	-3.00	62.93	-188.51	0.00	5,431,400	\$ -
2040	9.61	12.63	-3.02	62.93	-190.21	0.00	5,491,225	\$ -
							TOTAL	\$ -

Table A.2 British Columbia

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	5.17	4.82	0.35	62.93	21.73	21.73	3,947,282	\$ 85,782,158.98
2001	5.31	4.94	0.36	62.93	22.96	22.96	3,988,612	\$ 91,594,570.10
2002	5.44	5.06	0.38	62.93	24.17	24.17	4,018,237	\$ 97,134,046.53
2003	5.80	5.39	0.41	62.93	25.77	25.77	4,051,126	\$ 104,404,950.84
2004	6.04	5.61	0.43	62.93	27.27	27.27	4,079,327	\$ 111,257,319.62
2005	6.29	5.83	0.46	62.93	28.66	28.66	4,106,620	\$ 117,689,325.80
2006	6.42	5.95	0.48	62.93	30.03	30.03	4,134,087	\$ 124,139,681.32
2007	6.55	6.06	0.49	62.93	30.58	30.58	4,168,064	\$ 127,471,308.02
2008	6.66	6.18	0.48	62.93	30.47	30.47	4,208,825	\$ 128,226,459.31
2009	6.75	6.28	0.47	62.93	29.51	29.51	4,254,956	\$ 125,567,641.08
2010	6.82	6.38	0.44	62.93	27.97	27.97	4,307,863	\$ 120,492,614.40
2011	6.86	6.44	0.42	62.93	26.28	26.28	4,365,333	\$ 114,702,811.10
2012	6.91	6.51	0.40	62.93	25.06	25.06	4,422,734	\$ 110,832,935.64
2013	6.98	6.57	0.40	62.93	25.38	25.38	4,470,065	\$ 113,447,988.70
2014	7.04	6.64	0.40	62.93	24.98	24.98	4,525,297	\$ 113,062,205.64
2015	7.10	6.70	0.39	62.93	24.83	24.83	4,582,257	\$ 113,780,449.90
2016	7.15	6.77	0.37	62.93	23.38	23.38	4,652,763	\$ 108,781,093.16
2017	7.20	6.85	0.35	62.93	22.26	22.26	4,722,489	\$ 105,138,683.70
2018	7.27	6.94	0.33	62.93	20.63	20.63	4,800,498	\$ 99,041,186.50
2019	7.36	7.05	0.31	62.93	19.57	19.57	4,873,602	\$ 95,391,448.97
							TOTAL	\$ 2,207,938,879.32
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	7.49	7.18	0.31	62.93	19.43	19.43	4,952,397	\$ 96,224,976.67
2021	7.65	7.33	0.32	62.93	19.97	19.97	5,032,363	\$ 100,474,591.70
2022	7.80	7.45	0.34	62.93	21.58	21.58	5,114,369	\$ 110,351,248.68
2023	7.99	7.62	0.37	62.93	23.34	23.34	5,181,057	\$ 120,929,873.32
2024	8.20	7.82	0.38	62.93	23.65	23.65	5,278,834	\$ 124,836,979.53
							TOTAL	\$ 552,817,669.90

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	8.40	8.00	0.39	62.93	24.72	24.72	5,405,244	\$ 133,605,159.25
2026	8.86	8.35	0.50	62.93	31.60	31.60	5,456,774	\$ 172,425,984.79
2027	9.24	8.64	0.60	62.93	37.75	37.75	5,519,528	\$ 208,367,312.19
2028	9.67	8.97	0.70	62.93	43.98	43.98	5,552,825	\$ 244,226,984.62
2029	10.00	9.23	0.76	62.93	47.87	47.87	5,606,375	\$ 268,362,103.10
2030	10.32	9.51	0.81	62.93	51.15	51.15	5,652,550	\$ 289,148,901.70
2031	10.66	9.81	0.86	62.93	53.87	53.87	5,692,700	\$ 306,678,259.99
2032	11.01	10.12	0.89	62.93	56.23	56.23	5,727,675	\$ 322,059,972.12
2033	11.37	10.44	0.93	62.93	58.32	58.32	5,757,475	\$ 335,750,562.76
2034	11.72	10.77	0.95	62.93	59.81	59.81	5,782,825	\$ 345,870,895.78
2035	12.06	11.10	0.97	62.93	60.78	60.78	5,804,900	\$ 352,801,798.41
2036	12.39	11.42	0.97	62.93	60.87	60.87	5,824,575	\$ 354,548,649.85
2037	12.70	11.74	0.96	62.93	60.49	60.49	5,842,300	\$ 353,375,863.68
2038	12.99	12.05	0.94	62.93	59.34	59.34	5,858,325	\$ 347,632,897.99
2039	13.26	12.34	0.91	62.93	57.54	57.54	5,872,800	\$ 337,937,803.27
2040	13.52	12.63	0.89	62.93	55.83	55.83	5,886,000	\$ 328,588,462.10
							TOTAL	\$ 4,701,381,611.59

Table A.3 Manitoba

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	5.88	4.82	1.06	62.93	66.72	66.72	1,136,326	\$ 75,814,923.19
2001	5.98	4.94	1.03	62.93	65.12	65.12	1,139,628	\$ 74,211,901.69
2002	6.06	5.06	1.00	62.93	63.02	63.02	1,143,641	\$ 72,077,061.79
2003	6.43	5.39	1.05	62.93	65.86	65.86	1,148,167	\$ 75,620,875.84
2004	6.66	5.61	1.05	62.93	65.80	65.80	1,153,032	\$ 75,869,662.33
2005	6.86	5.83	1.03	62.93	64.73	64.73	1,158,832	\$ 75,010,177.24
2006	6.89	5.95	0.95	62.93	59.66	59.66	1,166,688	\$ 69,602,383.17
2007	6.93	6.06	0.88	62.93	55.07	55.07	1,173,341	\$ 64,620,877.58
2008	6.98	6.18	0.80	62.93	50.29	50.29	1,179,657	\$ 59,323,893.49
2009	7.00	6.28	0.72	62.93	45.19	45.19	1,185,182	\$ 53,558,278.17
2010	7.00	6.38	0.63	62.93	39.43	39.43	1,192,141	\$ 47,006,111.21
2011	6.96	6.44	0.52	62.93	32.68	32.68	1,201,085	\$ 39,251,509.68
2012	6.91	6.51	0.40	62.93	25.31	25.31	1,211,973	\$ 30,678,883.84
2013	6.84	6.57	0.27	62.93	16.76	16.76	1,224,159	\$ 20,519,098.97
2014	6.78	6.64	0.14	62.93	8.61	8.61	1,238,595	\$ 10,664,794.16
2015	6.73	6.70	0.02	62.93	1.54	1.54	1,253,216	\$ 1,926,713.35
2016	6.69	6.77	-0.09	62.93	-5.54	0.00	1,268,156	\$ -
2017	6.64	6.85	-0.21	62.93	-13.11	0.00	1,282,022	\$ -
2018	6.61	6.94	-0.33	62.93	-20.88	0.00	1,299,880	\$ -
2019	6.59	7.05	-0.46	62.93	-29.25	0.00	1,318,987	\$ -
							TOTAL	\$ 845,757,145.68
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	6.60	7.18	-0.58	62.93	-36.28	0.00	1,338,645	\$ -
2021	6.65	7.33	-0.67	62.93	-42.44	0.00	1,356,881	\$ -
2022	6.71	7.45	-0.74	62.93	-46.66	0.00	1,370,761	\$ -
2023	6.82	7.62	-0.81	62.93	-50.66	0.00	1,383,484	\$ -
2024	6.97	7.82	-0.85	62.93	-53.75	0.00	1,399,719	\$ -
							TOTAL	\$ -

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	7.10	8.00	-0.90	62.93	-56.71	0.00	1,428,784	\$ -
2026	7.20	8.35	-1.15	62.93	-72.39	0.00	1,423,728	\$ -
2027	7.34	8.64	-1.31	62.93	-82.38	0.00	1,428,401	\$ -
2028	7.50	8.97	-1.47	62.93	-92.62	0.00	1,424,550	\$ -
2029	7.70	9.23	-1.53	62.93	-96.41	0.00	1,432,850	\$ -
2030	7.93	9.51	-1.59	62.93	-99.81	0.00	1,440,525	\$ -
2031	8.18	9.81	-1.63	62.93	-102.52	0.00	1,447,825	\$ -
2032	8.45	10.12	-1.67	62.93	-105.05	0.00	1,454,975	\$ -
2033	8.72	10.44	-1.72	62.93	-108.05	0.00	1,462,075	\$ -
2034	9.00	10.77	-1.77	62.93	-111.47	0.00	1,469,125	\$ -
2035	9.27	11.10	-1.82	62.93	-114.84	0.00	1,475,950	\$ -
2036	9.54	11.42	-1.88	62.93	-118.35	0.00	1,482,500	\$ -
2037	9.82	11.74	-1.92	62.93	-120.95	0.00	1,488,725	\$ -
2038	10.09	12.05	-1.96	62.93	-123.48	0.00	1,494,650	\$ -
2039	10.35	12.34	-1.99	62.93	-125.47	0.00	1,500,325	\$ -
2040	10.59	12.63	-2.04	62.93	-128.19	0.00	1,505,775	\$ -
							TOTAL	\$ -

Table A.4 New Brunswick

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	5.34	4.82	0.52	62.93	32.48	32.48	751,460	\$ 24,405,993.09
2001	5.46	4.94	0.52	62.93	32.44	32.44	751,061	\$ 24,361,103.54
2002	5.57	5.06	0.51	62.93	32.07	32.07	750,541	\$ 24,068,555.09
2003	5.95	5.39	0.56	62.93	35.12	35.12	750,190	\$ 26,343,886.12
2004	6.19	5.61	0.58	62.93	36.30	36.30	749,770	\$ 27,213,116.02
2005	6.44	5.83	0.60	62.93	37.79	37.79	749,519	\$ 28,321,459.07
2006	6.52	5.95	0.58	62.93	36.25	36.25	749,413	\$ 27,164,762.04
2007	6.62	6.06	0.56	62.93	35.15	35.15	748,744	\$ 26,315,983.40
2008	6.73	6.18	0.55	62.93	34.80	34.80	747,180	\$ 25,999,094.60
2009	6.86	6.28	0.58	62.93	36.25	36.25	746,136	\$ 27,044,435.94
2010	6.97	6.38	0.59	62.93	37.12	37.12	746,202	\$ 27,699,900.31
2011	7.05	6.44	0.60	62.93	38.03	38.03	748,056	\$ 28,449,917.71
2012	7.12	6.51	0.61	62.93	38.19	38.19	750,726	\$ 28,673,524.86
2013	7.19	6.57	0.62	62.93	38.73	38.73	753,600	\$ 29,185,485.85
2014	7.27	6.64	0.63	62.93	39.67	39.67	756,374	\$ 30,006,682.98
2015	7.38	6.70	0.67	62.93	42.38	42.38	757,793	\$ 32,113,239.74
2016	7.51	6.77	0.74	62.93	46.54	46.54	758,719	\$ 35,311,883.33
2017	7.64	6.85	0.79	62.93	49.79	49.79	758,801	\$ 37,781,792.58
2018	7.81	6.94	0.86	62.93	54.29	54.29	761,130	\$ 41,322,686.94
2019	7.98	7.05	0.93	62.93	58.24	58.24	763,859	\$ 44,487,203.34
							TOTAL	\$ 596,270,706.56
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	8.19	7.18	1.01	62.93	63.42	63.42	767,643	\$ 48,683,529.82
2021	8.41	7.33	1.08	62.93	68.05	68.05	772,795	\$ 52,591,838.75
2022	8.63	7.45	1.17	62.93	73.78	73.78	778,573	\$ 57,439,865.93
2023	8.90	7.62	1.28	62.93	80.50	80.50	785,541	\$ 63,234,000.42
2024	9.20	7.82	1.38	62.93	86.79	86.79	798,343	\$ 69,287,995.95
							TOTAL	\$ 291,237,230.87

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficent multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	9.48	8.00	1.48	62.93	92.91	92.91	817,438	\$ 75,950,589.74
2026	9.76	8.35	1.41	62.93	88.46	88.46	813,365	\$ 71,951,478.63
2027	10.06	8.64	1.42	62.93	89.16	89.16	813,923	\$ 72,571,953.93
2028	10.38	8.97	1.41	62.93	88.93	88.93	808,600	\$ 71,910,301.77
2029	10.73	9.23	1.49	62.93	94.07	94.07	811,050	\$ 76,296,086.77
2030	11.10	9.51	1.58	62.93	99.68	99.68	812,700	\$ 81,013,203.69
2031	11.50	9.81	1.69	62.93	106.65	106.65	813,625	\$ 86,772,968.04
2032	11.91	10.12	1.79	62.93	112.45	112.45	813,900	\$ 91,523,417.20
2033	12.32	10.44	1.88	62.93	118.48	118.48	813,550	\$ 96,391,801.30
2034	12.75	10.77	1.99	62.93	125.07	125.07	812,850	\$ 101,665,042.22
2035	13.20	11.10	2.10	62.93	132.34	132.34	811,825	\$ 107,440,505.20
2036	13.63	11.42	2.21	62.93	139.16	139.16	810,600	\$ 112,805,344.03
2037	14.04	11.74	2.30	62.93	144.59	144.59	809,200	\$ 117,004,784.30
2038	14.43	12.05	2.39	62.93	150.13	150.13	807,625	\$ 121,250,387.64
2039	14.82	12.34	2.47	62.93	155.60	155.60	805,875	\$ 125,394,665.80
2040	15.19	12.63	2.56	62.93	161.11	161.11	803,975	\$ 129,528,286.47
							TOTAL	\$ 1,539,470,816.74

Table A.5 Newfoundland

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	4.50	4.82	-0.32	62.93	-20.18	0.00	547,574	\$ -
2001	4.63	4.94	-0.31	62.93	-19.79	0.00	539,353	\$ -
2002	4.73	5.06	-0.33	62.93	-20.98	0.00	532,276	\$ -
2003	5.04	5.39	-0.35	62.93	-22.12	0.00	526,347	\$ -
2004	5.27	5.61	-0.34	62.93	-21.33	0.00	522,244	\$ -
2005	5.48	5.83	-0.35	62.93	-22.22	0.00	519,611	\$ -
2006	5.59	5.95	-0.36	62.93	-22.59	0.00	518,197	\$ -
2007	5.69	6.06	-0.37	62.93	-23.50	0.00	516,137	\$ -
2008	5.82	6.18	-0.36	62.93	-22.52	0.00	513,235	\$ -
2009	5.94	6.28	-0.34	62.93	-21.53	0.00	510,759	\$ -
2010	6.04	6.38	-0.33	62.93	-20.91	0.00	510,702	\$ -
2011	6.12	6.44	-0.33	62.93	-20.48	0.00	513,535	\$ -
2012	6.19	6.51	-0.32	62.93	-19.92	0.00	518,088	\$ -
2013	6.28	6.57	-0.30	62.93	-18.63	0.00	522,190	\$ -
2014	6.38	6.64	-0.26	62.93	-16.09	0.00	524,925	\$ -
2015	6.51	6.70	-0.20	62.93	-12.41	0.00	526,393	\$ -
2016	6.64	6.77	-0.13	62.93	-8.30	0.00	527,444	\$ -
2017	6.76	6.85	-0.09	62.93	-5.77	0.00	527,877	\$ -
2018	6.89	6.94	-0.05	62.93	-3.20	0.00	528,782	\$ -
2019	7.07	7.05	0.02	62.93	0.99	0.99	528,510	\$ 523,924.42
							TOTAL	\$ 523,924.42
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	7.33	7.18	0.15	62.93	9.60	9.60	527,199	\$ 5,061,654.03
2021	7.67	7.33	0.34	62.93	21.24	21.24	525,166	\$ 11,153,344.34
2022	8.05	7.45	0.60	62.93	37.47	37.47	525,689	\$ 19,698,250.78
2023	8.56	7.62	0.94	62.93	59.12	59.12	526,106	\$ 31,105,193.68
2024	9.05	7.82	1.23	62.93	77.17	77.17	529,277	\$ 40,841,746.15
							TOTAL	\$ 107,860,188.97

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	9.52	8.00	1.52	62.93	95.45	95.45	533,962	\$ 50,964,074.07
2026	9.80	8.35	1.45	62.93	90.94	90.94	524,997	\$ 47,740,974.97
2027	10.20	8.64	1.55	62.93	97.79	97.79	519,626	\$ 50,811,678.37
2028	10.65	8.97	1.68	62.93	105.64	105.64	511,750	\$ 54,060,530.53
2029	11.20	9.23	1.97	62.93	123.76	123.76	508,975	\$ 62,993,266.94
2030	11.78	9.51	2.26	62.93	142.53	142.53	506,000	\$ 72,119,163.93
2031	12.33	9.81	2.53	62.93	159.09	159.09	502,775	\$ 79,986,923.33
2032	12.89	10.12	2.77	62.93	174.51	174.51	499,450	\$ 87,157,644.00
2033	13.43	10.44	2.99	62.93	188.02	188.02	495,900	\$ 93,239,952.70
2034	13.94	10.77	3.18	62.93	199.84	199.84	492,275	\$ 98,378,401.36
2035	14.45	11.10	3.35	62.93	211.11	211.11	488,475	\$ 103,122,088.01
2036	14.94	11.42	3.52	62.93	221.45	221.45	484,625	\$ 107,322,098.21
2037	15.42	11.74	3.69	62.93	231.93	231.93	480,675	\$ 111,481,018.50
2038	15.90	12.05	3.85	62.93	242.35	242.35	476,650	\$ 115,515,084.45
2039	16.37	12.34	4.03	62.93	253.38	253.38	472,575	\$ 119,740,849.12
2040	16.80	12.63	4.17	62.93	262.27	262.27	468,425	\$ 122,852,310.77
							TOTAL	\$ 1,377,486,059.26

Table A.6 Nova Scotia

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	5.59	4.82	0.77	62.93	48.25	48.25	931,850	\$ 44,958,017.74
2001	5.68	4.94	0.74	62.93	46.44	46.44	932,952	\$ 43,326,347.68
2002	5.77	5.06	0.71	62.93	44.70	44.70	933,316	\$ 41,721,230.17
2003	6.13	5.39	0.74	62.93	46.36	46.36	933,148	\$ 43,264,785.32
2004	6.34	5.61	0.73	62.93	45.84	45.84	934,168	\$ 42,824,737.73
2005	6.55	5.83	0.71	62.93	44.95	44.95	935,777	\$ 42,067,828.19
2006	6.62	5.95	0.67	62.93	42.41	42.41	938,056	\$ 39,783,681.71
2007	6.70	6.06	0.64	62.93	40.15	40.15	938,308	\$ 37,668,403.31
2008	6.80	6.18	0.63	62.93	39.39	39.39	938,339	\$ 36,959,267.90
2009	6.90	6.28	0.62	62.93	39.03	39.03	936,510	\$ 36,555,827.95
2010	7.00	6.38	0.62	62.93	39.19	39.19	936,198	\$ 36,687,099.35
2011	7.07	6.44	0.63	62.93	39.67	39.67	936,857	\$ 37,164,832.95
2012	7.13	6.51	0.62	62.93	39.06	39.06	939,580	\$ 36,704,140.02
2013	7.18	6.57	0.61	62.93	38.28	38.28	942,216	\$ 36,069,808.77
2014	7.27	6.64	0.63	62.93	39.55	39.55	943,413	\$ 37,310,129.61
2015	7.39	6.70	0.68	62.93	42.96	42.96	942,194	\$ 40,476,857.79
2016	7.54	6.77	0.77	62.93	48.14	48.14	940,290	\$ 45,268,607.33
2017	7.67	6.85	0.82	62.93	51.68	51.68	938,007	\$ 48,476,534.09
2018	7.81	6.94	0.87	62.93	54.48	54.48	940,163	\$ 51,222,914.75
2019	7.95	7.05	0.90	62.93	56.44	56.44	944,883	\$ 53,325,151.35
							TOTAL	\$ 831,836,203.73
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	8.12	7.18	0.94	62.93	59.14	59.14	952,428	\$ 56,328,500.62
2021	8.30	7.33	0.97	62.93	60.98	60.98	962,250	\$ 58,678,542.63
2022	8.47	7.45	1.02	62.93	63.97	63.97	976,746	\$ 62,477,895.73
2023	7.86	7.62	0.24	62.93	15.18	15.18	989,807	\$ 15,021,585.26
2024	7.68	7.82	-0.14	62.93	-8.81	0.00	1,009,992	\$ -
							TOTAL	\$ 192,506,524.24

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	7.48	8.00	-0.52	62.93	-32.80	0.00	1,035,685	\$ -
2026	8.63	8.35	0.27	62.93	17.22	17.22	1,033,935	\$ 17,799,601.16
2027	9.33	8.64	0.69	62.93	43.16	43.16	1,037,574	\$ 44,777,831.65
2028	10.06	8.97	1.09	62.93	68.75	68.75	1,033,625	\$ 71,061,893.82
2029	10.34	9.23	1.10	62.93	69.46	69.46	1,038,300	\$ 72,124,190.76
2030	10.63	9.51	1.12	62.93	70.35	70.35	1,041,425	\$ 73,265,291.04
2031	10.95	9.81	1.14	62.93	71.81	71.81	1,043,175	\$ 74,905,854.76
2032	11.29	10.12	1.17	62.93	73.92	73.92	1,043,750	\$ 77,155,908.52
2033	11.67	10.44	1.23	62.93	77.26	77.26	1,043,075	\$ 80,589,357.06
2034	12.04	10.77	1.27	62.93	80.14	80.14	1,041,700	\$ 83,483,309.97
2035	12.44	11.10	1.34	62.93	84.60	84.60	1,039,800	\$ 87,969,144.12
2036	12.82	11.42	1.40	62.93	88.32	88.32	1,037,575	\$ 91,639,945.36
2037	13.21	11.74	1.48	62.93	92.91	92.91	1,035,075	\$ 96,169,168.97
2038	13.60	12.05	1.55	62.93	97.82	97.82	1,032,325	\$ 100,979,686.89
2039	14.00	12.34	1.65	62.93	104.06	104.06	1,029,325	\$ 107,116,355.64
2040	14.38	12.63	1.75	62.93	110.38	110.38	1,026,150	\$ 113,271,179.64
							TOTAL	\$ 1,192,308,719.35

Table A.7 Ontario

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	4.74	4.82	-0.08	62.93	-4.86	0.00	11,260,589	\$ -
2001	4.86	4.94	-0.08	62.93	-4.80	0.00	11,400,768	\$ -
2002	4.98	5.06	-0.08	62.93	-5.17	0.00	11,559,310	\$ -
2003	5.28	5.39	-0.11	62.93	-6.69	0.00	11,745,779	\$ -
2004	5.49	5.61	-0.12	62.93	-7.49	0.00	11,942,293	\$ -
2005	5.71	5.83	-0.13	62.93	-7.93	0.00	12,120,447	\$ -
2006	5.83	5.95	-0.12	62.93	-7.50	0.00	12,280,514	\$ -
2007	5.95	6.06	-0.11	62.93	-6.96	0.00	12,423,447	\$ -
2008	6.08	6.18	-0.10	62.93	-6.24	0.00	12,560,960	\$ -
2009	6.20	6.28	-0.09	62.93	-5.53	0.00	12,680,038	\$ -
2010	6.30	6.38	-0.07	62.93	-4.70	0.00	12,798,463	\$ -
2011	6.39	6.44	-0.06	62.93	-3.64	0.00	12,911,270	\$ -
2012	6.47	6.51	-0.04	62.93	-2.55	0.00	13,038,371	\$ -
2013	6.55	6.57	-0.02	62.93	-1.52	0.00	13,164,221	\$ -
2014	6.64	6.64	0.00	62.93	-0.09	0.00	13,294,606	\$ -
2015	6.73	6.70	0.03	62.93	1.67	1.67	13,418,394	\$ 22,427,207.59
2016	6.83	6.77	0.06	62.93	3.69	3.69	13,534,130	\$ 49,967,301.17
2017	6.94	6.85	0.09	62.93	5.43	5.43	13,635,643	\$ 74,077,570.96
2018	7.04	6.94	0.10	62.93	6.07	6.07	13,768,865	\$ 83,539,056.66
2019	7.15	7.05	0.09	62.93	5.96	5.96	13,930,699	\$ 83,044,822.50
							TOTAL	\$ 313,055,958.89
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	7.26	7.18	0.08	62.93	4.88	4.88	14,140,732	\$ 68,968,043.40
2021	7.38	7.33	0.06	62.93	3.52	3.52	14,367,060	\$ 50,539,067.23
2022	7.47	7.45	0.01	62.93	0.89	0.89	14,594,255	\$ 12,966,387.46
2023	7.62	7.62	0.00	62.93	0.08	0.08	14,747,872	\$ 1,184,025.67
2024	7.81	7.82	-0.01	62.93	-0.85	0.00	14,973,578	\$ -
							TOTAL	\$ 133,657,523.76

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	7.99	8.00	-0.02	62.93	-1.07	0.00	15,301,058	\$ -
2026	8.32	8.35	-0.03	62.93	-2.11	0.00	15,396,094	\$ -
2027	8.59	8.64	-0.05	62.93	-3.24	0.00	15,542,567	\$ -
2028	8.90	8.97	-0.07	62.93	-4.59	0.00	15,601,525	\$ -
2029	9.14	9.23	-0.09	62.93	-5.95	0.00	15,734,275	\$ -
2030	9.39	9.51	-0.12	62.93	-7.48	0.00	15,852,675	\$ -
2031	9.66	9.81	-0.15	62.93	-9.30	0.00	15,960,750	\$ -
2032	9.94	10.12	-0.18	62.93	-11.33	0.00	16,061,225	\$ -
2033	10.22	10.44	-0.22	62.93	-13.58	0.00	16,155,400	\$ -
2034	10.52	10.77	-0.25	62.93	-15.84	0.00	16,244,500	\$ -
2035	10.81	11.10	-0.29	62.93	-18.30	0.00	16,328,225	\$ -
2036	11.09	11.42	-0.33	62.93	-20.45	0.00	16,406,925	\$ -
2037	11.38	11.74	-0.35	62.93	-22.24	0.00	16,480,425	\$ -
2038	11.68	12.05	-0.37	62.93	-23.39	0.00	16,549,300	\$ -
2039	11.97	12.34	-0.38	62.93	-23.84	0.00	16,614,175	\$ -
2040	12.26	12.63	-0.38	62.93	-23.60	0.00	16,675,475	\$ -
							TOTAL	\$ -

Table A.8 Prince Edward Island

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	5.68	4.82	0.86	62.93	54.24	54.24	135,860	\$ 7,369,108.42
2001	5.73	4.94	0.79	62.93	49.94	49.94	136,115	\$ 6,796,965.02
2002	5.79	5.06	0.73	62.93	46.23	46.23	136,256	\$ 6,298,732.84
2003	6.14	5.39	0.75	62.93	47.36	47.36	136,520	\$ 6,465,693.08
2004	6.34	5.61	0.73	62.93	46.19	46.19	136,724	\$ 6,315,775.01
2005	6.52	5.83	0.69	62.93	43.14	43.14	137,000	\$ 5,910,851.78
2006	6.54	5.95	0.59	62.93	37.16	37.16	137,367	\$ 5,104,970.49
2007	6.59	6.06	0.53	62.93	33.07	33.07	137,759	\$ 4,555,856.71
2008	6.67	6.18	0.49	62.93	31.06	31.06	137,870	\$ 4,281,890.97
2009	6.78	6.28	0.50	62.93	31.42	31.42	137,838	\$ 4,330,439.58
2010	6.90	6.38	0.53	62.93	33.04	33.04	138,269	\$ 4,568,245.20
2011	6.96	6.44	0.52	62.93	32.64	32.64	139,061	\$ 4,538,817.70
2012	7.01	6.51	0.50	62.93	31.38	31.38	140,487	\$ 4,408,157.05
2013	7.05	6.57	0.48	62.93	30.18	30.18	142,368	\$ 4,296,338.34
2014	7.13	6.64	0.49	62.93	30.81	30.81	143,669	\$ 4,426,142.30
2015	7.24	6.70	0.54	62.93	33.79	33.79	144,170	\$ 4,871,648.98
2016	7.36	6.77	0.58	62.93	36.77	36.77	144,298	\$ 5,306,516.47
2017	7.45	6.85	0.60	62.93	37.69	37.69	144,367	\$ 5,441,024.95
2018	7.54	6.94	0.60	62.93	37.83	37.83	145,692	\$ 5,511,785.14
2019	7.61	7.05	0.55	62.93	34.91	34.91	148,080	\$ 5,168,946.31
							TOTAL	\$ 105,967,906.37
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	7.66	7.18	0.47	62.93	29.87	29.87	151,041	\$ 4,511,175.17
2021	7.75	7.33	0.42	62.93	26.36	26.36	154,659	\$ 4,077,582.63
2022	7.89	7.45	0.43	62.93	27.16	27.16	157,300	\$ 4,271,806.29
2023	8.10	7.62	0.48	62.93	29.97	29.97	160,220	\$ 4,801,062.37
2024	8.37	7.82	0.55	62.93	34.30	34.30	163,926	\$ 5,623,171.28
							TOTAL	\$ 23,284,797.73

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	8.61	8.00	0.61	62.93	38.11	38.11	169,224	\$ 6,449,247.81
2026	8.69	8.35	0.34	62.93	21.45	21.45	171,444	\$ 3,677,636.85
2027	8.79	8.64	0.15	62.93	9.15	9.15	173,697	\$ 1,589,258.18
2028	8.88	8.97	-0.09	62.93	-5.52	0.00	174,525	\$ -
2029	9.07	9.23	-0.17	62.93	-10.56	0.00	175,900	\$ -
2030	9.28	9.51	-0.23	62.93	-14.71	0.00	177,025	\$ -
2031	9.48	9.81	-0.32	62.93	-20.20	0.00	177,900	\$ -
2032	9.77	10.12	-0.35	62.93	-22.22	0.00	178,675	\$ -
2033	10.02	10.44	-0.42	62.93	-26.24	0.00	179,325	\$ -
2034	10.32	10.77	-0.45	62.93	-28.23	0.00	180,000	\$ -
2035	10.63	11.10	-0.47	62.93	-29.39	0.00	180,625	\$ -
2036	10.96	11.42	-0.45	62.93	-28.52	0.00	181,250	\$ -
2037	11.29	11.74	-0.45	62.93	-28.26	0.00	181,800	\$ -
2038	11.63	12.05	-0.42	62.93	-26.57	0.00	182,325	\$ -
2039	11.96	12.34	-0.38	62.93	-23.90	0.00	182,825	\$ -
2040	12.34	12.63	-0.29	62.93	-18.02	0.00	183,275	\$ -
							TOTAL	\$ 11,716,142.83

Table A.9 Quebec

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	4.61	4.82	-0.21	62.93	-13.40	0.00	7,278,345	\$ -
2001	4.76	4.94	-0.18	62.93	-11.62	0.00	7,304,262	\$ -
2002	4.92	5.06	-0.14	62.93	-9.00	0.00	7,333,272	\$ -
2003	5.28	5.39	-0.11	62.93	-6.70	0.00	7,368,278	\$ -
2004	5.54	5.61	-0.07	62.93	-4.46	0.00	7,409,180	\$ -
2005	5.80	5.83	-0.04	62.93	-2.45	0.00	7,452,405	\$ -
2006	5.93	5.95	-0.01	62.93	-0.72	0.00	7,499,647	\$ -
2007	6.08	6.06	0.02	62.93	1.35	1.35	7,546,074	\$ 10,220,492.54
2008	6.24	6.18	0.06	62.93	3.96	3.96	7,595,250	\$ 30,110,383.81
2009	6.41	6.28	0.12	62.93	7.74	7.74	7,649,819	\$ 59,239,102.91
2010	6.57	6.38	0.19	62.93	12.25	12.25	7,712,083	\$ 94,460,410.44
2011	6.71	6.44	0.26	62.93	16.42	16.42	7,785,352	\$ 127,872,932.06
2012	6.83	6.51	0.32	62.93	19.87	19.87	7,865,888	\$ 156,272,464.89
2013	6.93	6.57	0.35	62.93	22.28	22.28	7,945,696	\$ 177,028,024.41
2014	7.02	6.64	0.39	62.93	24.24	24.24	8,014,129	\$ 194,274,231.00
2015	7.11	6.70	0.41	62.93	25.76	25.76	8,071,988	\$ 207,897,881.15
2016	7.22	6.77	0.44	62.93	27.95	27.95	8,118,087	\$ 226,910,330.22
2017	7.33	6.85	0.48	62.93	30.17	30.17	8,152,902	\$ 245,941,859.76
2018	7.48	6.94	0.53	62.93	33.62	33.62	8,194,339	\$ 275,484,553.87
2019	7.65	7.05	0.59	62.93	37.25	37.25	8,251,337	\$ 307,397,653.80
							TOTAL	\$ 2,113,110,320.85
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	7.83	7.18	0.65	62.93	40.83	40.83	8,332,872	\$ 340,260,946.88
2021	8.03	7.33	0.70	62.93	44.34	44.34	8,427,692	\$ 373,725,160.18
2022	8.21	7.45	0.75	62.93	47.42	47.42	8,501,853	\$ 403,164,473.98
2023	8.47	7.62	0.84	62.93	53.11	53.11	8,549,655	\$ 454,074,239.74
2024	8.73	7.82	0.91	62.93	57.40	57.40	8,616,871	\$ 494,604,743.68
							TOTAL	\$ 2,065,829,564.46

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	8.97	8.00	0.97	62.93	60.90	60.90	8,748,393	\$ 532,742,706.73
2026	9.40	8.35	1.05	62.93	65.94	65.94	8,752,117	\$ 577,152,886.95
2027	9.75	8.64	1.11	62.93	69.78	69.78	8,780,271	\$ 612,667,579.24
2028	10.15	8.97	1.18	62.93	74.49	74.49	8,760,500	\$ 652,597,533.97
2029	10.47	9.23	1.24	62.93	78.01	78.01	8,778,025	\$ 684,767,199.94
2030	10.81	9.51	1.29	62.93	81.46	81.46	8,789,625	\$ 715,992,496.91
2031	11.16	9.81	1.36	62.93	85.29	85.29	8,796,725	\$ 750,300,621.23
2032	11.54	10.12	1.42	62.93	89.42	89.42	8,800,675	\$ 786,959,413.27
2033	11.93	10.44	1.49	62.93	93.71	93.71	8,802,275	\$ 824,822,013.54
2034	12.33	10.77	1.57	62.93	98.56	98.56	8,802,625	\$ 867,595,503.07
2035	12.74	11.10	1.65	62.93	103.74	103.74	8,801,225	\$ 913,073,791.37
2036	13.16	11.42	1.74	62.93	109.34	109.34	8,798,025	\$ 961,969,192.65
2037	13.56	11.74	1.82	62.93	114.45	114.45	8,792,825	\$ 1,006,346,199.51
2038	13.94	12.05	1.89	62.93	119.15	119.15	8,786,000	\$ 1,046,883,215.78
2039	14.29	12.34	1.95	62.93	122.76	122.76	8,777,875	\$ 1,077,599,100.04
2040	14.63	12.63	2.00	62.93	125.70	125.70	8,768,600	\$ 1,102,174,289.57
TOTAL								\$ 13,113,643,743.74

Table A.10 Saskatchewan

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2000	6.46	4.82	1.64	62.93	103.21	103.21	1,017,878	\$ 105,057,465.86
2001	6.55	4.94	1.61	62.93	101.35	101.35	1,016,071	\$ 102,978,608.18
2002	6.65	5.06	1.59	62.93	99.98	99.98	1,011,747	\$ 101,150,709.03
2003	7.09	5.39	1.70	62.93	107.19	107.19	1,005,642	\$ 107,796,830.33
2004	7.36	5.61	1.75	62.93	110.42	110.42	1,000,355	\$ 110,454,525.33
2005	7.62	5.83	1.79	62.93	112.47	112.47	997,455	\$ 112,181,296.97
2006	7.68	5.95	1.74	62.93	109.27	109.27	996,940	\$ 108,933,246.00
2007	7.76	6.06	1.70	62.93	106.97	106.97	995,167	\$ 106,448,981.93
2008	7.83	6.18	1.65	62.93	103.71	103.71	993,853	\$ 103,067,989.60
2009	7.84	6.28	1.56	62.93	98.23	98.23	997,497	\$ 97,979,479.77
2010	7.79	6.38	1.42	62.93	89.09	89.09	1,007,302	\$ 89,745,114.34
2011	7.69	6.44	1.25	62.93	78.54	78.54	1,022,282	\$ 80,285,015.23
2012	7.57	6.51	1.06	62.93	66.77	66.77	1,038,777	\$ 69,361,121.00
2013	7.44	6.57	0.87	62.93	54.62	54.62	1,054,579	\$ 57,599,831.18
2014	7.32	6.64	0.68	62.93	42.81	42.81	1,071,245	\$ 45,864,374.70
2015	7.20	6.70	0.50	62.93	31.29	31.29	1,087,313	\$ 34,025,633.79
2016	7.10	6.77	0.32	62.93	20.22	20.22	1,102,362	\$ 22,284,510.92
2017	7.02	6.85	0.17	62.93	10.75	10.75	1,113,662	\$ 11,974,702.33
2018	6.96	6.94	0.02	62.93	1.34	1.34	1,126,480	\$ 1,509,720.99
2019	6.92	7.05	-0.13	62.93	-8.11	0.00	1,139,404	\$ -
							TOTAL	\$ 1,468,699,157.50
YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2020	6.92	7.18	-0.26	62.93	-16.64	0.00	1,152,463	\$ -
2021	6.93	7.33	-0.40	62.93	-25.29	0.00	1,164,264	\$ -
2022	7.00	7.45	-0.45	62.93	-28.48	0.00	1,167,255	\$ -
2023	7.10	7.62	-0.52	62.93	-32.63	0.00	1,168,822	\$ -
2024	7.24	7.82	-0.59	62.93	-36.99	0.00	1,172,985	\$ -
							TOTAL	\$ -

YEAR	Provincial 75 and over age rate (2-year lag, 3-year weighted average)	National 75 and over age rate (2-year lag, 3-year weighted average)	Provincial rate minus National rate	75 and over age rate coefficient	Age coefficient multiplied by age rate difference	Per capita "Top-up Payment" amount	Population (2-year lag, 3-year weighted average)	Total Top-up Payment
2025	7.31	8.00	-0.70	62.93	-43.77	0.00	1,191,087	\$ -
2026	7.33	8.35	-1.03	62.93	-64.58	0.00	1,196,532	\$ -
2027	7.40	8.64	-1.25	62.93	-78.39	0.00	1,206,152	\$ -
2028	7.53	8.97	-1.44	62.93	-90.59	0.00	1,210,250	\$ -
2029	7.72	9.23	-1.51	62.93	-95.28	0.00	1,219,025	\$ -
2030	7.95	9.51	-1.56	62.93	-98.35	0.00	1,227,750	\$ -
2031	8.21	9.81	-1.59	62.93	-100.34	0.00	1,236,475	\$ -
2032	8.50	10.12	-1.62	62.93	-101.67	0.00	1,245,225	\$ -
2033	8.81	10.44	-1.63	62.93	-102.58	0.00	1,254,050	\$ -
2034	9.11	10.77	-1.66	62.93	-104.41	0.00	1,262,675	\$ -
2035	9.40	11.10	-1.69	62.93	-106.46	0.00	1,271,050	\$ -
2036	9.68	11.42	-1.73	62.93	-109.12	0.00	1,279,025	\$ -
2037	9.97	11.74	-1.77	62.93	-111.53	0.00	1,286,725	\$ -
2038	10.22	12.05	-1.83	62.93	-115.24	0.00	1,294,175	\$ -
2039	10.45	12.34	-1.89	62.93	-119.15	0.00	1,301,475	\$ -
2040	10.66	12.63	-1.97	62.93	-123.71	0.00	1,308,650	\$ -
							TOTAL	\$ -