



Centre for Health Economics
and Policy Analysis

CHEPA WORKING PAPER SERIES
PAPER 16-01

Extending health benefits to low-income populations
— a scoping review

G. Emmanuel Guindon
Christina Hackett
Mathieu Poirier
Naomi Scott

CHEPA WORKING PAPER SERIES

The Centre for Health Economics and Policy Analysis (CHEPA) Working Paper Series provides for the circulation on a pre-publication basis of research conducted by CHEPA faculty, staff, and internal and external associates. The Working Paper Series is intended to stimulate discussion on analytical, methodological, quantitative, and policy issues in health economics and health policy analysis. The views expressed in the papers are the views of the authors and do not necessarily reflect the views of the Centre or its sponsors. Readers of Working Papers are encouraged to contact the authors with comments, criticisms, and suggestions.

Extending health benefits to low-income populations — a scoping review

G. Emmanuel Guindon, 1,2,3*
Christina Hackett, 1
Mathieu Poirier, 1
Naomi Scott, 1

1. Centre for Health Economics and Policy Analysis, McMaster University, Hamilton, ON, Canada
2. Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada
3. Department of Economics, McMaster University, Hamilton, ON, Canada

* Corresponding author

G. Emmanuel Guindon
Centre for Health Economics and Policy Analysis
McMaster University
1280 Main Street West
Hamilton, ON, Canada, L8S 4K1
Tel: 1-905-525-9140 x24658
E-Mail: emmanuel.guindon@mcmaster.ca

Acknowledgements: We thank Debbie Milinkovic, Nicholas Quinn and Melodie Yunju Song for their research assistance and Gioia Buckley, Ashley Collins, Carley Hay, Jeremiah Hurley, Eric Nauenberg, Arthur Sweetman, Joanne Thanos and members of McMaster University's Polinomix Group for their comments and discussion.

Funding: This review was funded in part by the Government of Ontario (grant #02045) and by Ontario SPOR SUPPORT Unit, which is supported by the Canadian Institutes of Health Research and the Government of Ontario. GEG holds the Centre for Health Economics and Policy Analysis (CHEPA)/Ontario Ministry of Health and Long-Term Care (MOHLTC) Chair in Health Equity, an endowed Chair funded in part by the MOHLTC. CH received financial support from the Social Sciences and Humanities Research Council under the auspices of the Community First: Impacts of Community Engagement (CFICE) program. The views expressed are the views of the authors and should not be taken to represent the views of the Government of Ontario.

December 2016

Executive summary

Background. Health insurance coverage impacts a variety of outcomes for health systems, as well as the populations that health systems serve. In most high-income countries, ‘universal’ health insurance coverage is provided for eligible citizens and defined as primary health insurance coverage. When private health financing is in place alongside, or parallel to, a primarily publicly financed system (such as in Canada), voluntary private health insurance can be supplementary or complementary to the public system. Private health financing occurs largely through out-of-pocket expenditure for the total cost, or partial cost (cost-sharing) of services or treatments, and through the purchase of private health insurance (Hurley and Johnson, 2014). Supplementary health insurance is defined as private health insurance that covers additional services not covered by the government or social scheme, and complementary private health insurance as that which complements insurance coverage of the publicly funded scheme by covering a continuum of the out-of-pocket costs not otherwise covered or reimbursed (OECD, 2015). The structure of, and relationship to, both the publicly financed system and the services covered determine the uptake of and potential for supplementary and complementary health insurance in a population.

The Ontario Health Insurance Plan (OHIP) provides publicly financed insurance coverage for ‘medically necessary’ services. In addition, insurance coverage is extended to certain populations for items and services that are not under the defined benefit package outlined by the publicly provided medicare coverage. These non-medicare services include, but are not limited to, prescription drugs, dental, and vision. These include, but are not limited to the Ontario Drug Benefit, Healthy Smiles Ontario, and further public insurance coverage to those in the Ontario Works and the Ontario Disability Support Programs (administered through the Ministry for Community and Social Services). Within these plans, there is variability of eligibility for insurance coverage, and this insurance coverage exists along the cost-sharing continuum – e.g., there is variability in what price healthcare service users face according to their level of eligibility and insurance coverage. In 2015, the government of Ontario committed in its annual budget to create a Low-Income Health Benefit (LIHB) that would extend prescription drug, vision, assistive devices and mental health coverage to children and youth in low-income families. Additionally, as part of the Poverty Reduction Strategy (2014-2019), Ontario committed to explore options to extend health benefits including dental for all low-income Ontarians. Designing such program to achieve key policy objectives within the context of existing public programs, private plans and fiscal imperatives of the Ontario government, is a challenge. We investigate the relationship between supplementary health insurance (and how it is designed) and cost-sharing faced at the point of health service use, and key outcomes, which include various health system services’ utilization and population health outcomes, as well as non health system-related outcomes

Literature search. We searched three electronic bibliographic databases: MEDLINE via PubMed, EconLit via ProQuest and Health Systems Evidence. Unpublished and grey literature were searched via Google and Google Scholar in English and French. Six specialty journals were hand-searched (*Health Affairs, Healthcare Policy, Health Economics, Journal of Health Economics, and Health Economics, Policy and Law*). Two working paper repositories were searched: RePEc (Research Papers in Economics) and the National Bureau of Economic Research (NBER) working papers series. We searched for reviews (systematic or not) and individual studies and focused some searches on Canadian studies. We examined references of relevant reviews and individual studies that we identified. We also examined studies that cited key studies using Thomson Reuters Web of Science and Google Scholar.

We first surveyed reviews that examined the effect of basic primary health insurance coverage or cost-sharing on key outcomes. Second, we surveyed reviews that examined specifically the effect of supplemental health insurance or cost-sharing on drug utilization and on the use of allied health (e.g., physiotherapy, occupational therapy), dental, vision and mental health services. Third, we surveyed Canadian studies that have examined the effect of insurance or cost-sharing (including delisting). When we were unable to identify reviews or a sufficient number of Canadian studies, we surveyed key studies from OECD countries.

Findings. Several findings emerged from our review pertaining to the relationship between health insurance and outcomes of interest, which are relevant for policy and planning and future research in the context of Ontario. These findings highlight the demographics of those insured, the impact of health insurance coverage on health service utilization and health outcomes, as well as impacts extending beyond the healthcare system to the labour market and the provincial tax base.

Who has private supplementary health insurance?

Evidence was reviewed from different contexts: in the US, and countries with incomplete public health insurance coverage, having any health insurance is typically tied to employment or eligibility for coverage through income or age (US Medicare or Medicaid), leaving a population of those with no public or private health insurance. Ontarians have public health insurance coverage through OHIP, and some have voluntary private health insurance, which supplements the provincial plan's defined benefit package. Figures regarding various aspects of private insurance coverage demonstrate that a large majority of Canadians hold some type of private supplementary health insurance. In 2005 about 60% of Ontarians held employer-based prescription drug insurance coverage and 5% held individually purchased drug insurance. The majority of those covered obtain insurance as a benefit of employment (of themselves, a spouse or a parent). In 2011, about 63% of Ontarians were offered health benefits by employers (including drug and dental insurance). There is a strong positive relationship between income and private health insurance. The relationship between age and having private health insurance is tempered by the onset of expanded public coverage at certain age thresholds (in Ontario, age 65).

What is the impact on health service utilization?

There is strong evidence that having both primary and supplemental health insurance has an effect on the utilization of health services, including, outpatient, inpatient, dental, and vision care and allied healthcare services as well as prescription drugs. In contexts with no universal health insurance coverage, accessing primary health insurance increased primary and preventative healthcare utilization. In the Canadian context, supplementary private health insurance increased utilization for non-covered healthcare services (e.g., prescription drugs, physiotherapy, certain types of mental healthcare and dental care), as well as primary healthcare. Effects found for publicly covered service utilization are larger for outpatient and preventive services, and smaller for inpatient and emergency services.

Increasing cost-sharing for any healthcare service at the point of use, in contexts with and without universal public health insurance coverage, decreased rates of essential and non-essential drug treatment, adherence to medication regimens and service use. Introducing higher cost-sharing for the poor and chronically ill was associated with a decrease in prescription drug use and primary healthcare use, and an increase in other healthcare service use, particularly emergency and inpatient use. In terms of design, existing evidence suggests that value-based insurance design (VBID) policies – where there is an attempt to improve the quality of care by selectively encouraging or discouraging the use of specific health care services through price signals to payers (both public and private) – have an impact on health service utilization. In particular, VBID policies were consistently associated with improved medication adherence and lower patient out-of-pocket costs for VBID services.

Overall, low-income individuals may be more sensitive to prices they face at the point of access for healthcare services, while those with chronic illness may be less sensitive to price. The evidence is, however, surprisingly mixed and limited.

Does having health insurance impact health outcomes?

On the whole, existing evidence strongly suggests that the expansion of primary health insurance improves health outcomes and that the positive effects on health improvements are larger among vulnerable groups (e.g., the poor, the sick and the elderly). Conversely, higher cost-sharing was found to impact health negatively, particularly among the most vulnerable, and result in adverse events such as acute care admission, long-term care admission, and mortality.

How do health insurance arrangements impact the labour market?

Access to health insurance after retirement can facilitate early retirement and access to spousal health insurance can reduce secondary earner labour force participation. Welfare lock can occur as a result of a lack of affordable private health insurance (prevent welfare recipients from entering the workforce – also known as the welfare wall and the poverty trap). With increased public coverage, employment-based private health insurance coverage may be crowded out (i.e., the expansions of subsidized public programs can encourage individuals at the margin to switch from private plans to public ones). Raising the income threshold for public health insurance coverage increases demand (for public insurance) for those newly eligible.

How do health insurance tax subsidies impact employers and the tax base?

Tax subsidies are often provided to employers who purchase supplementary health insurance, however these cost the government of Canada \$6.9 billion in forgone revenue in 2014, while Ontario's retail sales tax exemption for individual life and health insurance premiums cost the province about \$625 million. On net, tax subsidies for health insurance are not tax-saving and may increase inequalities in supplemental health insurance coverage (i.e., tax subsidies provide larger tax savings to the wealthy relative to the poor which increases their likelihood of having private supplemental coverage). In Canada, a 1% increase in the after-tax price for supplementary health insurance is expected to decrease demand by approximately 0.5%. Employers may respond to changes in tax subsidies by altering the amount and quality of supplemental insurance offered to their employees, and smaller organizations are likely more sensitive to tax subsidy changes than larger ones. In other words, tax subsidies financially incentivize employers to purchase supplementary health insurance and the loss of these subsidies would likely result in lower demand or purchasing levels.

What does this mean for Ontario's Low-Income Health Benefit (LIHB)?

- Introducing a low-income health benefit in Ontario would likely increase the use of (essential/ appropriate) healthcare services for those who had otherwise faced cost-sharing at the point of care. This includes preventative and primary healthcare use, as well as prescription drug use.
- Expanded prescription drug insurance coverage or subsidization of prescription drug cost-sharing through supplementary insurance coverage would likely improve medication adherence and uptake of essential medications (for which there are copays).
- Expanded insurance coverage could decrease 'downstream' utilization of acute care services – the effect on total health expenditure is unclear.
- Vulnerable populations (the elderly, poor and chronically ill) would experience a greater impact of expanded coverage in terms of improved health outcomes.
- Employee responses to public plan expansion suggest that as income eligibility thresholds increase, there is greater uptake by low-income individuals in the public plan.
- Current tax subsidies available for private, supplementary health insurance may increase the cost to the public payer (in Ontario, OHIP), through the increase in utilization of publicly financed healthcare services and may not improve the equitable distribution of private health insurance.

Evidence reviewed and described suggests that a LIHB could have variable effects for Ontarians, namely for certain population sub-types such as the 'working poor', the chronically ill and vulnerable populations.

Areas for further exploration are:

- The quality of evidence of the impact of the design of health insurance coverage;
- The impact of the design of health insurance coverage on areas and outcomes outside of the healthcare system;
- The relevance of evidence described to the Ontario context.

1. INTRODUCTION

The Canadian healthcare system is highly decentralized; the majority of health system planning and service delivery is implemented by government at the provincial level. Each province provides insurance coverage for healthcare services delivered by physicians or within hospital, under the medicare system. Medicare-covered services are largely free at the point of use, however the package of services (or defined benefits) is limited. The majority of total Canadian health expenditure (approximately 70%) is financed publicly, through tax revenues (Marchildon, 2013). Services not covered through medicare are insurable through private financing.

Health insurance coverage impacts a variety of outcomes for health systems, as well as the populations that health systems serve. In most high-income countries, 'universal' health insurance coverage is provided for eligible citizens and defined as primary health insurance coverage. When private health financing is in place alongside, or parallel to, a primarily publicly financed system (such as in Canada), voluntary private health insurance can be supplementary or complementary to the public system. Private health financing occurs largely through out-of-pocket expenditure for the total cost, or partial cost (cost-sharing) of services or treatments, and through the purchase of private health insurance (Hurley and Johnson, 2014). In the Canadian context, basic primary health coverage is provided through public insurance for physician and hospital services, without cost-sharing. Supplementary insurance can be purchased privately or provided publicly (often with cost-sharing) to add additional services such as prescription drugs and dental and vision care services. Complementary insurance refers to additional coverage purchased through private insurance to cover any cost-sharing left after basic primary coverage. Given the absence of cost-sharing in Canada's publicly provided primary health insurance, complementary insurance does not exist (OECD, 2015). In practice, the role and scope of supplementary and complementary private health insurance to finance healthcare services along this continuum of cost-sharing is highly context-dependent. The structure of, and relationship to, both the publicly financed system and the services covered determine the uptake of and potential for supplementary and complementary health insurance in a population.

In Ontario, the Ontario Health Insurance Plan (OHIP) provides insurance coverage for 'medically necessary' services. In addition, insurance coverage is extended to certain populations for items and services that are not under the defined benefit package outlined by medicare. These non-medicare services include, but are not limited to, prescription drugs (drugs), dental, and vision. Within programs, there are varying eligibility requirements and coverage levels (where some programs offer full coverage, whereas others include cost sharing arrangements). For instance, the Ontario Drug Benefit (ODB) covers drug costs for a number of individuals including those over age 65; those in long-term care home or a home providing specialized care services and those facing high drug costs relative to their income (through the Trillium Drug Benefit). Additionally, those receiving social assistance can receive public insurance coverage through Ontario Works or the Ontario Disability Support Program (both are administered through the Ministry for Community and Social Services).

In 2015, the government of Ontario committed in its annual budget to create a Low-Income Health Benefit (LIHB) that would extend prescription drug, vision, assistive devices and mental health coverage to children and youth in low-income families. Additionally, as part of the Poverty Reduction Strategy (2014-2019), Ontario committed to explore options to extend health benefits including dental for all low-income Ontarians. Designing such a program to achieve key policy objectives within the context of existing public programs (the ODB and social assistance), private plans (e.g., for those who work and contribute to group employer plans) and fiscal imperatives of the Ontario government, is a challenge. We investigate the relationship between supplementary health insurance and cost-sharing faced at the point of health service use, and key outcomes.

While supplementary insurance provides a unique mechanism for and scope of insurance coverage for individuals in relation to the publicly financed healthcare system in Canada, we draw upon evidence representing Ontario and other provinces/territories, and more broadly Canadian contexts, from which there can be policy learning. We also draw from literature detailing particular examples of supplementary health insurance, as well as extensive cost-sharing literature, recognizing that the underlying continuum of insurance coverage and price signals faced by health service users is comparable. We aim to explore gaps existing for those not covered by such complementary public plans, and examine how insurance that is supplementary to public insurance impacts upon outcomes of interest – employment, financial and health outcomes and healthcare utilization, as well as outline and describe the demographic characteristics of individuals who purchase supplementary health insurance.

2. METHODS

We searched three electronic bibliographic databases: MEDLINE via PubMed, EconLit via ProQuest and Health Systems Evidence. Unpublished and grey literature were searched via Google and Google Scholar in English and French. Six specialty journals were hand-searched (*Health Affairs, Healthcare Policy, Health Economics, Journal of Health Economics, and Health Economics, Policy and Law*). Two working paper repositories were searched: RePEc (Research Papers in Economics) and the National Bureau of Economic Research (NBER) working papers series. We searched for reviews (systematic or not) and individual studies and focused some searches on Canadian studies. We examined references of relevant reviews and individual studies that we identified. We also examined literature that cited key studies using Thomson Reuters Web of Science and Google Scholar.

In our investigation of the relationship between supplementary health insurance and cost-sharing and key outcomes, we first examined the characteristics of individuals who report having private supplementary health insurance. Second, we examined the impact of supplementary private health insurance on the utilization of health care services and prescription drugs (privately or publicly provided) and on health and labour market outcomes. Third, we examined how employers may respond to the introduction of publicly provided supplementary health insurance. Fourth, we paid special attention to the role of tax subsidies and credits. Fifth, we examined an alternative cost-sharing design that has received much attention recently: value-based insurance design. Throughout our review, we paid special attention to effects that might differ across socioeconomic status.

In our effort to synthesize existing the evidence, we first surveyed reviews that examined the effect of basic primary health insurance coverage or cost-sharing on key outcomes. Second, we surveyed reviews that examined specifically the effect of supplemental health insurance or cost-sharing on drug utilization and on the use of allied health (e.g., physiotherapy, occupational therapy), dental, vision and mental health services. Third, we surveyed Canadian studies that have examined the effect of insurance or cost-sharing (including delisting). When we were unable to identify reviews or a sufficient number of Canadian studies, we surveyed key studies from OECD countries.

3. RESULTS

3.1. Generally, what are the characteristics of individuals who report having private supplementary health insurance? And specifically, to what extent do low-income Canadians and Ontarians report having private supplementary health insurance?

Key messages:

- Strong positive relationship between income and uptake of private health insurance, even after controlling for individual and household characteristics. Such a relationship is documented in a number of countries and health systems, including Canada and Ontario;
- Strong link between employment and insurance, which is partly due to the tax treatment of employment-based health insurance;
- The relationship between age and private drug insurance is not strictly increasing or decreasing, which is partly a consequence of publicly provided drug plans that are age-based;
- No single source summarizes the number and characteristics of Canadians and Ontarians who hold private supplemental health insurance. Figures regarding various aspects of private insurance coverage demonstrate that a large majority of Canadians hold some type of private supplementary health insurance. The majority of those covered obtain insurance as a benefit of employment (of themselves, a spouse or a parent).
- 2005 data from the Canadian Community Health Survey (CCHS) indicated that about 60% of Ontarians held employer-based prescription drug insurance coverage and 5% held individually purchased drug insurance in 2005. An additional 11% reported government-provided insurance coverage.
- 2011 data from the Survey of Labour and Income Dynamics (SLID) suggested that about 63% of Ontarians were offered health benefits by employers (including drug and dental insurance).

A number of reviews have examined, directly or indirectly, the characteristics of individuals who report having private supplementary health insurance. Kiil (2012) reviewed the empirical literature on what characterizes individuals with voluntary private health insurance in universal health care systems. Kill found that the probability of having private health insurance was strongly positively correlated with income, employment status, education and to lesser extent age, and negatively correlated with being foreign born or immigrants. Some characteristics were found to have mixed effects on the probability of having private health insurance; examples include marital status, household composition, sex, and having chronic conditions.

Thomson and Mossialos (2009) provided a comprehensive overview and analysis of markets for private health insurance in the European Union. The authors found that the typical subscriber was aged 40-50 years old, relatively well off, better educated, employed as a white collar worker (often at management level or higher), worked for larger companies or was self-employed, lived in urban areas and was male. Between countries, the extent and quality of basic primary health insurance coverage were major determinants of the demand for private health insurance. Mossialos and Thomson (2004) examined voluntary health insurance (VHI) in the Europe Union and found that most VHI subscribers came from higher income groups. This was

also the case for supplementary VHI. In addition to income, characteristics that were found to be associated with the demand for VHI included age, sex, occupational status, educational status and area of residence. Odeyemi and Nixon (2013) provided an overview of private health insurance in different health care systems and discussed factors that affected its uptake and equity. Using a small sample of countries (United States, United Kingdom, The Netherlands, France, Australia, and Latvia), Odeyemi and Nixon found that private health insurance uptake was positively correlated with higher income, education, and age. Atherly (2001) examined supplemental health insurance in US Medicare populations. For individually purchased plans, Atherly found that the probability of having supplemental health insurance was higher for individuals who were older, female, white, non-smoking, and more knowledgeable about Medicare and those who had higher education, higher income and wealth/assets, good health status, and chronic conditions. For employer-based benefits that followed the holder into retirement, Atherly found that the probability of having private supplemental health insurance was inversely related to age and was positively related with income, education and tenure and for individuals who were married, non-smoking, in a union or working in large industries or for the government.

The Canadian studies we reviewed typically focused on prescription drug and dental insurance. Dewa, et al., (2005) used the 2002 cycle of the Canadian Community Health Survey (CCHS) —a repeated cross-sectional survey— and observed a strong income gradient for prescription drug insurance coverage (public or private) with the highest income quintile (>\$90,000) having 4.5 times greater odds of having private drug insurance coverage than those in the lowest income quintile (<\$25,000 per year). Dewa, et al. also found that being female and in poor or fair health increased the odds of having prescription drug insurance coverage.

Kapur and Basu (2005) used a number of datasets (including the National Population Health Survey (NPHS), the Survey of Consumer Finances (SCF), the Survey of Household Spending (SHS), and aggregate personal income tax data from the Canada Customs and Revenue Agency) to estimate drug insurance coverage in 1997 and found a strong income gradient for drug insurance for both public (negative) and private (positive) drug insurance. Kapur and Basu also reported that females had greater odds of having prescription drug insurance and that public drug insurance age eligibility (e.g., turning 65) had a strong negative effect on the odds of having private prescription drug insurance.

Barnes, Abban et al. (2015) reported data specific to Ontario. Using data from the 2011 cycle of the Survey of Labour and Income Dynamics (SLID) — a longitudinal household survey — the authors observed a strong income gradient for both medical insurance, which most likely includes drug insurance and dental insurance (SLID has two health-related response categories: 'medical insurance or health plan in addition to public health insurance coverage', and 'dental plan or dental insurance coverage with the health plan'). Data from SLID represent health benefits offered by employers (i.e., not necessarily taken-up by employees). Insurance coverage rises from about 15% for both medical and dental in the lowest income category (<\$10,000) to more than 90% for yearly gross incomes higher than \$60,000. Barnes et al. also reported that a larger proportion of men reported being offered employer-based medical benefits.

Locker, Maggiriias and Quinonez (2011), using data from a national telephone survey conducted in 2008 among adults (18+), examined dental insurance and found a positive income gradient for access to private insurance and a negative income gradient for public insurance. And, unsurprisingly, a strong negative gradient was found between out-of-pocket dental expenses and household income. Locker et al. observed no differences in private insurance coverage according to sex but significant differences according to age. About two-thirds of individuals aged 18-34 reported having private dental insurance while about only one third of those aged ≥ 75 years did so. Millar and Locker (1999), using data from the 1996/97 cycle of the National Population Health Survey (NPHS) — a longitudinal household survey — also reported a strong income gradient for dental insurance with highest income quartile ($< \$80,000$) having 7.4 greater odds of dental insurance than the lowest income quartile ($< 20,000$ for a 4-person family). Similar to Locker, et al., Millar and Locker found a negative association between age and private dental insurance.

No single source summarizes the number and characteristics of Canadians who hold private supplemental health insurance. Figures regarding various aspects of private insurance coverage demonstrate that a large majority of Canadians hold some type of private health insurance. The majority of those covered obtain insurance as a benefit of employment (of themselves, a spouse or a parent). The data are most comprehensive for private drug insurance coverage. Allin and Hurley (2009), using CCHS data, estimated that about 60% of Ontarians held employer-based prescription drug insurance coverage and 5% held individually purchased drug insurance in 2005. An additional 11% reported government-provided insurance coverage. Allin and Hurley also broke down insurance coverage by income quintile: there was a clear positive income gradient for employer-based insurance and a negative income gradient for public insurance (see Figure 1). Devlin, Sarma, and Zhang (2011) using the same data (CCHS, 2005) presented estimates by age. For individual aged 25–64, 77% of Ontarians held employer-based prescription drug insurance coverage, 4% held individually purchased drug insurance and 8% held government drug insurance. For individuals aged ≥ 65 , 27% of Ontarians held employer-based or individually purchased drug insurance. Kapur and Basu (2005) plotted drug insurance coverage pattern by income and health (see Figures 2 and 3). The strong positive relationship between income and private health insurance is evident. Dewa, et al. (2005), using CCHS data estimated that about 77 and 75% of Canadians and Ontarians reported having prescription drug insurance in 2002 with fairly wide differences between provinces (from about 61% in Prince Edward Island to more than 85% in Québec). Locker, Maggiriias and Quinonez (2011), using data from a national telephone survey, estimated that 56% of respondents were covered by employment-related private dental insurance, either their own or that of a family member, and about 5% were covered by public dental insurance in 2008. Ramraj, Sadeghi et al., (2013), using several national datasets (including CHMS, CCHS, NPHS, GSS, FAMEX/SHS, WES) estimated dental insurance coverage in Canada by income adequacy (a measure of household income that takes into account household size and composition) in 1996, 1998, 2003, and 2009 (Figure 4).

3.2. What is the impact of supplementary private health insurance/cost-sharing on the utilization of health care services and drugs (privately and publicly provided)? Are there any socioeconomic differences in the impact of supplementary health insurance/cost-sharing on the utilization of health care services and drugs?

Key messages:

- Strong evidence that health insurance increased utilization of health services. Effects were larger for outpatient and preventive services, and smaller for inpatient and emergency services;
- Strong evidence that increased cost-sharing was associated with lower rates of drug treatment, poorer adherence, and more frequent therapy discontinuation;
- For chronic conditions (e.g., congestive heart failure, diabetes, and schizophrenia), studies consistently found that higher cost-sharing was associated with increased use of other medical care such as emergency and inpatient services;
- Cost-sharing was consistently found to decrease non-essential drug use as well as the use of essential medications. While some studies found that increased cost-sharing decreased non-essential drug use more than essential medications, the evidence was mixed;
- Some evidence that Canadians with supplemental health insurance used more publicly funded physician services;
- Low-income individuals may be more sensitive to price while those with chronic illness may be less sensitive to price; evidence is, however, surprisingly mixed and limited.

We reviewed evidence regarding the impact of health insurance coverage on health services utilization from international contexts as well as evidence pertaining to Canada specifically. We also drew on studies concerning cost-sharing mechanisms in healthcare, either attached to, or independent of primary and supplementary insurance coverage. Reviews primarily concerned with studies from the United States (US) focused on the impact of primary health insurance coverage, while studies from countries with universal public health insurance coverage or mandatory social health insurance enrolment focused on the impact of supplementary health insurance or changes in public insurance coverage. These reviews build on the legacy of the influential RAND Health Insurance Experiment (HIE).

3.2.1. Impact of primary health insurance/cost-sharing on health services utilization

The RAND HIE is perhaps the most comprehensive example of an experimental study aimed at understanding demand responses in healthcare services to changes in cost-sharing faced by individuals and families. The HIE took place from 1974 to 1982, with approximately 7700 participants¹ across six diverse sites in the United States, and measured outcomes pertaining to health service utilization as well as health status. The study randomly assigned families to one of five types of co-insurance, ranging from complete insurance

¹ All recruited individuals were under age 61 such that they would not become eligible for Medicare during the study (at age 65).

coverage (free care), to 95% co-insurance.² The HIE clearly indicated that higher cost-sharing reduced utilization and expenditures. Increased cost-sharing did not direct people to more ‘appropriate’ uses of care, and having primary health insurance was associated with increased probability of any healthcare utilization, but not with reduced cost per episode once accessed (Lohr et al., 1986; Manning et al., 1987). Variable outcomes were found across groups — low income individuals facing any level of cost-sharing, especially for children, sought less necessary care (Gruber, 2006; Lohr et al., 1986; Manning et al., 1987). While still a major influence in terms of study design and outcomes, evidence reviewed since the HIE has contradicted some of the main findings of RAND, emphasizing the need for further exploration of the impacts of primary health insurance on various disease-groups, subpopulations and physician behaviour (Freeman et al., 2008; Nyman, 2007). Nonetheless, the HIE offers valuable insight into how cost-sharing and primary health insurance impact on healthcare service utilization.

Since the HIE, several literature reviews have examined studies focused on the impact of primary health insurance coverage. On the whole, strong associations were found between the level of insurance coverage provided by primary health insurance and health services utilization — higher cost-sharing and thus lower levels of insurance coverage lowered the number of preventative and outpatient physician visits (Buchmueller et al., 2005; Hadley, 2003; Holst, 2010; Liu and Chollet, 2006). Having primary health insurance was generally found to increase health services utilization in the US (Buchmueller et al., 2005; Freeman et al., 2008). Cost-sharing was found to decrease both essential and non-essential use of healthcare services and both cost-effective and non-cost-effective healthcare services (Remler and Greene, 2009). In the US, cost-sharing introduced in emergency departments was found to reduce utilization without harm to patients after following up for one year (Holst, 2010; Remler and Greene, 2009).

In Canada, a study found that copays in the province of Saskatchewan (ranging from 6-33%) had a negative effect on the number of physician visits with increased copays, while no copay effect was observed for hospital use (Beck and Horne, 1980).

The degree to which healthcare service utilization is impacted varies across sub-populations (low-income individuals and older individuals); service-user types (those with chronic conditions, high frequency users vs. low); healthcare systems; insurance coverage and benefit packages. Evidence syntheses have examined how having health insurance impacted upon low-income individuals, however the evidence was inconsistent and unreliable (Baicker and Goldman, 2011; Pendzialek et al., 2016; Remler and Greene, 2009). The literature reviewed also presented mixed evidence for the impact of health insurance coverage and cost-sharing levels for older individuals. Cost-sharing was found to be a barrier to accessing healthcare services for the elderly, having negative effects on utilization (Holst, 2010; Rice and Matsuoka, 2004). In keeping with the HIE, children without primary health insurance (in the US context) are less likely to receive routine care (Hadley,

² In total there were five types of co-insurance arrangements - 0%, 25%, 50% and 95%; and a deductible of \$150 per person or \$450 per family for outpatient care only. The deductible plans had a cap of \$1000, and the maximum total dollar expenditure ranged from 5 to 15% of total income.

2003); while insured children average one more physician visit per year than uninsured children; the effect was found to be smaller for poor children (Buchmueller et al., 2005).

Our review suggests that increasing access to health insurance does increase demand for health services, while increasing cost-sharing either through reduction in insurance coverage or through copay mechanisms decreases service use. Introducing a low-income health benefit in Ontario could increase the use of healthcare services for those who had otherwise faced a cost-sharing mechanism. Understanding that cost-sharing on the demand side is a blunt instrument, impacting necessary use across the lifespan, introducing insurance coverage for required medications and preventative services could decrease the ‘squeezed balloon effect’ or emergent care use resulting from financial barriers to upstream care.

3.2.2. Impact of drug insurance/cost-sharing on prescription drug utilization

Our interest is in exploring reviews and empirical work to understand how having drug insurance coverage through health insurance, and the degree to which cost-sharing, may influence prescription drug use. Evidence from OECD countries highlights the impact of the breadth of health insurance coverage on prescription drug utilization, as well as that of cost-sharing mechanisms on access to and demand for prescription drugs across countries and various sub-populations.

The RAND HIE offered comprehensive results of the impact of primary health insurance and cost-sharing on prescription drug use. Lohr et al. analyzed the HIE data across several collected outcomes, including health service utilization (discussed above), and found that, like health services, prescription drug use was impacted by the presence of cost-sharing (Lohr et al., 1986). Individuals in the free plan were up to 50% more likely to use prescribed medication than those in any cost-sharing plan. The HIE data facilitated the differentiation of these effects by socioeconomic status — low-income children and adults were less likely to use drugs when facing cost-sharing and the magnitude of these effects were especially pronounced for low-income children versus all children (Lohr et al., 1986).

A number of reviews have examined the effect of prescription drug insurance on drug utilization. Lexchin and Grootendorst (2004) systematically reviewed studies that examined the effects of prescription drug cost sharing on drug and health services use and on health in vulnerable populations (the poor and those with chronic illnesses). The evidence consistently indicated that cost-sharing decreased the use of prescriptions (including essential drugs) in these groups. Studies comparing prescription use among the poor and those with poor health found that those with insurance versus no insurance had greater usage. Among the insured, almost all studies looking at drug user fees (copayments, deductibles, and caps) found that user fees decreased drug use in vulnerable populations. Generally, drug price elasticity³ among those with low income and/or chronic illness ranged from -0.35 to -0.50. Goldman, Joyce and Zheng (2007) reviewed the effects of

³ Elasticities are unitless and represent a measure of the responsiveness of a variable to a change in the value of another variable; an own-price elasticity of demand measures the responsiveness of the demand for a good or service to a change in its own price (e.g., a change in cost-sharing). For example, a price elasticity of -0.5 indicates that a 10% increase in the price of prescription drug paid by users would result in a 5% reduction in drug use. See Hurley (2010) for more details.

drug cost-sharing features on the use of prescriptions. Overall, increased cost-sharing was associated with lower rates of drug treatment, poorer adherence, and more frequent therapy discontinuation. Although some research suggested higher price sensitivity among low income groups, the evidence was too limited to make any conclusion. Gemmill et al. (2007), noting the wide heterogeneity among studies, estimated a corrected measure of the drug price elasticity of -0.2. Luiza, Chaves, et al. (2015) systematically reviewed studies that examined the effects of cap and copayment policies on drug use. Overall, increasing patient cost through caps, copayments, coinsurance, or any combination, reduced the use of both essential and non-essential medicines, including medicines used for chronic, asymptomatic, and symptomatic conditions. Estimates varied from uncertain or small to moderate reductions.

Adams, Soumerai and Ross-Degnan (2001) examined the effects of drug insurance coverage on the use of prescription drugs among Medicare beneficiaries. The majority of studies indicated that drug insurance coverage was associated with greater use of all prescriptions (including essential drugs), while caps and copayments reduced drug spending. Further, considerable unmet needs found among Medicare beneficiaries suggested that use of prescriptions were out of necessity. Private Medigap insurance coverage was associated with lower overall drug use (including essential medications), and higher out of pocket costs compared with Medicaid, employer, and state drug insurance coverage. Polinski, Kilabuk, et al., (2010) systematically reviewed studies that examined the effect of Medicare Part D implementation (the US federal government program that subsidized the costs of prescription drugs and prescription drug insurance premiums for Medicare beneficiaries) on drug use. Part D implementation was associated with a 6 to 13% increase in drug use, while entry into the insurance coverage gap (requiring to pay all costs out-of-pocket) was associated with a 9 to 16% decrease in drug use. Further, patients entering the insurance coverage gap were 5 to 11% more likely to report discontinuing, switching, or failing to initiate a medication compared to patients not entering the gap. Polinski, Donohue et al., (2011) systematically reviewed the impact of Medicare Part D on the under- and overuse of specific medications. Part D implementation increased the use of certain under-used essential medications including clopidogrel and statins, especially among those previously uninsured. However, the inappropriate use of over-used medications including antibiotics for acute respiratory infection and proton pump inhibitors also increased. When cost-sharing increased during the insurance coverage gap, there was a decline in both essential and non-essential medications.

In publicly insured populations, the introduction of or increase in cost-sharing for prescription drugs reduced adherence to medicines (including essential medicines). Sinnott, Buckley et al. (2013) systematically reviewed and estimated the effect of introducing or increasing copayments for prescriptions on adherence to medicines in publicly insured populations. Results from their meta-analysis indicated an 11% increased odds of non-adherence among those publicly insured when required to copay for prescriptions compared to those not required to copay.

— *Drug insurance coverage changes in Canada: impacts across provinces*
- *Québec's mandatory drug insurance (1996)*

Québec's 1996 implementation of mandatory drug insurance presented an opportunity to examine the impact of cost-sharing on a variety of healthcare service utilization outcomes across various demographics. To help finance drug insurance coverage, cost-sharing was introduced for previously insured beneficiaries who received free prescription drugs (the elderly and those on social assistance). Tamblyn, Laprise et al. (2001) estimated the impact of introducing cost-sharing by examining (1) use of essential and less essential drugs and (2) rates of ED visits and serious adverse events (hospitalization, nursing home admissions, and mortality), before and after policy implementation. After the introduction of cost-sharing, the use of essential drugs decreased by 9% among elderly and by 14% among welfare recipients; and the use of less essential drugs decreased by 15 and 22%, respectively. ED visit rates, associated with reductions in the use of essential drugs, increased by 14% per 10 000 person-months for the elderly and by 54% for welfare recipients. The rate of adverse events, associated with reductions in the use of essential drugs, increased by 7% per 10 000 person-months for the elderly and by 13% for welfare recipients. Reductions in the use of less essential medications were not found to increase the risk of adverse events or ED visits. Contoyannis, Hurley, et al. (2005) estimated the elasticity of expenditure on prescription drug expenditure in response to changes in Quebec's public Pharmacare program. Price elasticity of expenditure was estimated using instrumental variable (IV) methods, and ranged between -0.12 and -0.16. Blais, Boucher, et al. (2001) examined the effect of cost-sharing on the use of four drug classes (anti-hypertensive agents, anticoagulants, nitrates, and benzodiazepines), for those aged 65 and older during Quebec's 1996 implementation of a cost-sharing policy. Using time series comparisons for monthly drug consumption (up to 13 months post-policy), non-significant decreases in the number of prescriptions were found for nitrates (5% decrease), antihypertensive agents (1%), and benzodiazepines (0.8%). A non-significant increase of 1.6% was found for anticoagulants. Blais, Couture, et al. (2003) examined the effect of cost-sharing on the use of three drug classes (inhaled corticosteroids, neuroleptics, and anticonvulsants), among those receiving social assistance. Using time series analyses with control series for monthly drug consumption, a statistically significant decrease of 37% was found in the use of inhaled corticosteroids for 11 months following the new drug plan. Non-significant decreases of 9 and 10% were found for the monthly consumption of neuroleptics and anticonvulsants, respectively. Wang, Li, et al. (2015) evaluated the effects of Quebec's mandatory, universal prescription insurance on drug use, general practitioner (GP) and specialist visits, hospitalizations, and health outcomes, using difference-in-differences estimation. The program was found to increase prescription use and GP visits, especially among the previously uninsured and those with chronic conditions, while having little effect on specialist visits and hospitalization. Total drug utilization (not limited to prescriptions) was found to increase by 13% in the previous month, with an estimated elasticity of -0.17 when only taking into account the reduction in copayment. The estimated spillover effect on the number of GP visits was about 10% (annually), while no statistically significant effects were found for specialist visits or hospitalizations.

- British Columbia's shift from age-based to income-based (2003)

British Columbia implemented a widely studied public pharmaceutical insurance policy change in May 2003 in an effort to control rising costs by shifting from age-based copayments with an annual maximum of \$200 per year to an income-based plan, which had the effect of decreasing the public share of drug expenditures from 74 to 55% for seniors, and 35 to 34% for non-seniors (Hanley et al., 2011). For residents over the age of 65

who used inhaled steroids, this resulted in a 30% increase in out-of-pocket spending during an intermediary copay period, and a 59% increase in out-of-pocket spending after implementation of the income-based deductibles plus coinsurance policy (Dormuth et al., 2009). One investigation of the effect of increasing the maximum annual copay from \$200 to \$275 indicated a -0.11 price elasticity of demand for prescription drugs by patients with rheumatoid arthritis, implying a 0.11% decrease in demand for every 1% increase in price (Li et al., 2007). Research on impacts of utilization of specific pharmaceuticals, however, is mixed. The introduction of copays and deductibles resulted in a significant reduction in use and initiation of antidepressant therapy by seniors, but this decrease in drug utilization was not accompanied by a significant change in health system utilization or adverse events associated with depression among the elderly (Wang et al., 2010; Wang et al., 2008). The policy change did not significantly affect initiation or continuation of antihypertensive pharmaceutical therapy, although there was some evidence of increasing end-of-year seasonality for continuation of therapy (Caetano et al., 2006). In contrast to these findings, seniors with new diagnoses of asthma or chronic obstructive pulmonary disease became 25% less likely to initiate treatment with inhaled steroids, and chronic users of inhaled steroids became 47% more likely to cease treatment after the introduction of copayments (Dormuth et al., 2006).

- Manitoba's change in copayment (1996)

A change in Manitoba's provincial drug benefit policy from a fixed deductible and copayment system to an income-based deductible system in April 1996, resulted in changes in receipt of prescriptions for inhaled corticosteroids by children with asthma. Overall, the policy was associated with decreased use of inhaled corticosteroid prescriptions for higher income children with severe asthma, and was not found to improve use among lower income children (Kozyrskyj et al., 2001).

- Nova Scotia's introduction of copayments (1990)

Kephart, Skedgel, et al. (2007) examined the impact of Nova Scotia's introduction of deductibles (copayment combined with annual limits) in 1990 on the use of essential and less essential drugs among senior beneficiaries (aged 65 and older) expected to reach the annual maximum. Copayments policies (\$3 per prescription and 20% of prescription cost) were associated with significant reductions in the mean quantity of medications (essential and less essential) used per month, ranging from 5 to 15%; but this effect was limited to those unlikely to reach the annual maximum copayment rather than those expected to reach the maximum. An indirect effect was found for income as lower-income neighbourhoods were more likely to reach the annual maximum and in turn, less likely to reduce drug use in response to copayment.

- Ontario, turning 65

Grootendorst, O'Brien and Andersen (1997) assessed the effects of eligibility for the Ontario Drug Benefit plan (on turning 65) on the use of prescription medications. The provision of first-dollar insurance coverage was associated with an increased probability of drug use (regardless of additional insurance). Another study found that receiving public drug insurance in the province was estimated to increase significantly the number of physician visits by about 13% (Roach, 2014). For Ontarians with congestive heart failure, diabetes mellitus, and acute infection, upon turning 65, hospitalization was more likely to occur for diabetes and acute

infection compared to the prior year. No decreases in hospitalization were found for any condition on turning 65. When stratified by SES, those from low-income neighbourhoods (lowest 2 quintiles), were more likely to be hospitalized only for congestive heart failure on turning 65 compared to the year prior (Hux et al., 2006).

3.2.3. Impact of drug insurance/cost-sharing on health services utilization

In the literature reviewed, increased cost-sharing was generally associated with lower rates of drug treatment, poorer adherence, and more frequent therapy discontinuation (Goldman et al., 2007). In addition, cost-sharing was found to have unintended effects on the process and outcomes of therapy (Gibson et al., 2005). Any savings from reduced prescription use may be offset by the increased use of other health care services such as emergency services and nursing home admissions (Lexchin and Grootendorst, 2004). Among the insured, almost all studies looking at drug user fees (copayments, deductibles, and caps) found that user fees decreased drug use in vulnerable populations. Generally, drug price elasticity among those with low income and/or chronic illness implied a decrease in demand between -0.3 to -0.5% for every 1% increase in user fees, and a higher share of income spending was reflected in higher price sensitivity (Lexchin and Grootendorst, 2004).

Medicare part D in the US provides an opportunity to understand how the interaction between primary and supplementary health insurance for certain groups differentially effects prescription drug utilization. The effects of benefit caps on drug utilization were seen as consistent with analogous cost-sharing features (Goldman et al., 2007). Increasing patient cost through caps, copayments, coinsurance, or any combination, may reduce the use of both essential and non-essential medicines — including medicines used for chronic, asymptomatic, and symptomatic conditions (Luiza et al., 2015). Some studies found increased utilization of other health care services (e.g. hospitalizations or ED use) due to discontinuation of important medications; however, the evidence available was limited and inconclusive (Luiza et al., 2015). Looking at policy type, fixed copayments with a ceiling and tiered fixed copayments may be less likely to reduce the use of essential medications or to increase healthcare utilization (Luiza et al., 2015).

In Canada, a study examining drug insurance coverage in BC, highlighted the unintended consequences of increasing demand-side cost-sharing for rheumatoid arthritis-related medications, which included a demand increase for physician visits (Li et al., 2007). In a representative sample of residents of Ontario, low-income individuals eligible for the Ontario Drug Benefit program enrolled in the reduced cost-sharing program used more medications (and incurred higher costs) compared to those with higher income — even after adjustment for health and demographic variables (Allin and Laporte, 2011). On average, higher-income groups used one and a half fewer prescription drugs in a year compared to the lowest income group in the reduced cost-sharing program (Allin and Laporte, 2011).

Overall, when individuals have access to drug insurance, an increase is seen in utilization of prescription medications, and improved medication adherence. When individuals face increased cost-sharing for medications, this reduces utilization of both essential, non-essential, cost-effective and non-cost-effective prescription drugs. The example of Medicare Part D offers an opportunity to understand how the interplay

between primary and supplementary health insurance for dually eligible individuals, when entering the drug insurance coverage gap, impacts access to and utilization of prescription medications. As noted above, losing insurance coverage and facing cost-sharing mechanisms at the entrance of the insurance coverage gaps caused a reduction in essential medication usage in those without supplementary insurance coverage, while it did not affect those with supplementary insurance coverage. Thus, in the context of Ontario, introducing a LIHB may improve medication adherence and utilization for those who previously may have faced cost-sharing-related barriers to care.

3.2.4. Impact of insurance on other health service utilization: allied, dental, mental and vision care

The impact of having health insurance on health service utilization in the areas of allied, mental, dental, and vision healthcare followed similar patterns in direction to those of general and prescription drug healthcare utilization. These areas of healthcare are typically not fully covered by provincially administered public health insurance systems in Canada. We explored how insurance coverage affects these areas, across sub-populations.

- Insurance coverage and allied healthcare

Although there is no accepted definition of allied healthcare, it is generally defined as health care related professions and personnel whose functions include assisting, facilitating, or complementing the work of physicians and other specialists in the health care system (Institute of Medicine (US) Committee to Study the Role of Allied Health Personnel, 1989). In Ontario, allied health professionals generally include audiologists, dietitians, medical laboratory technologists, medical radiation technologists, occupational therapists, pharmacists, physiotherapists, respiratory therapists and speech-language pathologists. In general, a review found that the demand for health services with less insurance coverage and higher levels of cost-sharing in both the US and Canada (mental health, dental, long-term care) proves more price elastic (Liu and Chollet, 2006).

Having insurance coverage for allied healthcare services was found to increase the odds of use thereof by individuals with chronic health issues by 1.3 times versus those without insurance coverage (Skinner et al., 2014). For those with more fulsome, versus lesser insurance coverage, the likelihood of using non-physiotherapy services (occupational and speech therapies) increased by 4.8 times, and for physiotherapy services, the likelihood was 1.5 times higher for those with fulsome insurance coverage, though this latter effect was statistically insignificant (Skinner et al., 2014). Utilization was further increased by the presence of co-morbidity or functional limitations (e.g. arthritis, hemiparesis), and higher education; while, income and age had inconsistent effects. Overall, the presence of insurance increased the utilization of allied services among those with chronic disease (Skinner et al., 2014).

- Insurance coverage and mental healthcare

Mental healthcare is another area of healthcare that has significant variability in insurance coverage across health systems internationally and Canadian provinces. In the United States, Mental Health Benefits Legislations (i.e., legislation changing regulations for mental health insurance coverage to improve financial

protection) were found to have positive effects on mental health service utilization following the legislation. This was indicated by increases in the use of specialist services, adoption of guideline concordant care, and service use for people identified as having a mental healthcare need (Sipe et al., 2015).

Within the Canadian context, Mulvale and Hurley (2008) examined the effects of private supplemental insurance on the utilization of prescription medication and four types of community-based providers for mental health problems in Canada. They found that private supplemental insurance positively and significantly increased the odds of using the following medications: sleep, mood stabilizers, anti-depressants, and anti-psychotics. The effect for anxiety medications was positive but not statistically significant. Private insurance coverage was not significantly associated with the use of provider services (psychiatrist, family physician, psychologist, or social worker).

In a sample of Canadians aged over 18 years who had seen a physician for a mental illness concern (affective or anxiety disorder) in the past 12 months, results from logistic regression indicated that the odds of using a psychotropic drug was significantly greater for those reporting prescription drug insurance coverage (Dewa et al., 2005). Another Canadian study found that public insurance coverage was found to increase utilization of psychotropic drugs by about 46% for individuals with relatively low levels of prescription drug use (with no statistically significant effect for the high-user group), while private insurance had no statistically significant effect on drug use for either group (Sarma et al., 2007). Having any prescription insurance (public or private) also significantly increased the number of non-psychotropic drugs used by both high and low users. Public insurance increased non-psychotropic drug use by about 95% for low-users and 34% for high-users; and private insurance increased non-psychotropic drug use by about 72% for low-users and 32% for high users (Devlin et al., 2011).

- Insurance coverage and dental healthcare

The evidence we found indicates that the presence of insurance coverage impacts dental care utilization. A review of US studies (including the Rand HIE) concluded that there was a positive relationship between dental coverage and the utilization of dental services (Bendall and Asubonteng, 1995). As was the case for inpatient and outpatient care and drugs, the Rand HIE found that insurance coverage for dental care increased dental care utilization of those insured as compared to those with less or no coverage. On average, individuals with free care had 34% more visits than individuals who faced 95% coinsurance plan. Insurance was also found to increase the use of specific services, such as diagnostic, preventive, and restorative services and had a larger effect in low-SES populations (Manning et al., 1986).

A number of studies have used Canadian data to examine associations between dental insurance and the use of dental care insurance. Having dental insurance coverage (vs. no insurance) was generally associated with higher odds of dental visits and conversely, those without dental insurance coverage were more likely to report only visiting the dentist for emergencies (Bhatti et al., 2007; Duncan and Bonner, 2014; Millar and Locker, 1999; Quinonez and Figueiredo, 2010; Ramraj et al., 2013).

- Insurance coverage and vision care

Zhang, Andersen et al., (2008) reviewed the theoretical and empirical literature on access to eye care and found that insurance coverage was associated with higher use of eye care services while in the Rand HIE, free care resulted in increased eye examinations and lens purchases (Lurie et al., 1989; Zhang et al., 2008).

In Ontario, delisting routine eye exams for those aged 20-64 was found to reduce utilization of vision care providers across age groups (-6.4% aged 20-39; -5.4% aged 40-64) (Jin et al., 2012). Delisting coverage for these services was also found to reduce utilization of vision care in the lowest income quintile while utilization increased for all other income groups (Jin et al., 2012). The gap in utilization between the highest and lowest income quintiles increased after delisting from 1.2 to 9.3% for those aged 20-39, and from 4.5 to 12.0% for those aged 40-64 (Jin et al., 2012). This policy change in Ontario also impacted upon publicly-funded retinopathy screening for adults with diabetes, as there was an 8.7% decrease in eye examination for those aged 40-65 with diabetes between 2004 and 2006 (Kiran et al., 2013). For people with diabetes aged 65 and older, eye examinations increased gradually from 1998 to 2010, but no substantial change occurred during the delisting period (Kiran et al., 2013). There was an increase (3.2%) in eye examinations by optometrists for those aged 65 and older, while there was a decrease (6.5%) for those aged 40 to 65, however a decrease in physician-administered eye exams for both age groups decreased between 2004 and 2006 (Kiran et al., 2013).

Introducing a low-income health benefit that increases insurance coverage for allied health, mental health, dental health and vision care, may increase utilization for low-income groups and those with chronic illnesses. While there is a paucity of, and mixed evidence regarding the lever effects of increasing versus decreasing insurance coverage for these services in the Canadian context, a potential effect of the LIHB could be to increase preventative and maintenance healthcare utilization, perhaps preventing emergent service use (as seen in the literature surrounding dental care insurance coverage).

3.3. What is the impact of supplementary health insurance on health outcomes? Are there any socioeconomic differences in the impact of supplementary health insurance on health outcomes?

Key messages:

- On the whole, existing evidence strongly suggests that the expansion of primary health insurance improved health outcomes and that health improvements were larger among vulnerable groups (e.g., the poor, the sick and the elderly). Conversely, higher cost-sharing was found to impact health negatively, particularly among the most vulnerable;
- Among the poor and those with chronic illnesses, higher drug cost-sharing was found to have reduced uptake of essential medications and in turn, this reduction was associated with the increased use of other services, including emergency services, nursing home admissions, and adverse events leading to acute care admission, long-term care admission, and mortality;
- The introduction of or increase in cost-sharing for prescription drugs reduced adherence to medicines (including essential medicines) in publicly insured populations;
- In the United States, mental health benefits legislations (i.e., legislation changing regulations for mental health insurance coverage to improve financial protection) were associated with improved mental health outcomes.

3.3.1. Impact of primary health insurance expansion/cost-sharing on health outcomes.

A fairly large number of studies have reviewed the effects of primary health insurance expansion and cost-sharing on health outcomes (Baicker and Goldman, 2011; Freeman et al., 2008; Hadley, 2003; Levy and Meltzer, 2008; Remler and Greene, 2009; Rice and Matsuoka, 2004). On the whole, existing evidence strongly suggests that the expansion of primary health insurance improved health outcomes and that health improvements were larger among vulnerable groups (e.g., the poor, the sick and the elderly). Conversely, higher cost-sharing was found to impact health negatively, particularly among the most vulnerable.

Hadley (2003) in his review of US and Canadian studies concluded that providing insurance coverage to the uninsured reduced premature mortality from 4 to 5% at the lower end, to up to 20 to 25% in the general adult population. Further, infant and childhood mortality was reduced by 4 to 8% when insurance coverage extended to infants, pregnant women, and children. Levy and Meltzer (2008) reviewed 18 natural experiments and found that health insurance expansions resulted in health improvements among vulnerable subgroups. Health insurance improved the health outcomes of infants, children, and persons with AIDS, as measured primarily by mortality or birth outcomes. Among adults, specific measures of health such as blood pressure were improved, especially among low-income groups. Freeman, Kadiyala et al. (2008) systematically reviewed studies that examined the causal effect of health insurance on utilization and health outcomes among non-elderly US adults. On the whole, those with insurance compared to no insurance were found to have better health outcomes. Among studies that examined the “already sick” populations (persons with HIV, automobile accident victims, and patients with acute appendicitis), all suggested that insurance was associated with more favourable health outcomes. Baicker and Goldman (2011) surveyed the effect of cost-sharing on the demand for healthcare and health in the United States. Although many observational and

quasi-experimental studies found that uninsured populations experienced worse health outcomes compared to insured populations, causality was unclear as group differences were often not accounted for. Baicker and Goldman, however, concluded that higher copayments ought to take into account that reductions in health services such as preventative care or drugs for chronic illness have the potential to negatively impact long-term health. Rice and Matsuoka (2004) reviewed the effects of cost-sharing on the use of prescription drugs and medical services, as well as health status, among seniors aged 65 and older, in the United States and Canada and found that increased cost-sharing reduced either or both utilization and health status.

3.3.2. Impact of prescription drug insurance coverage/cost-sharing on health outcomes.

Numerous reviews have examined the effects of prescription drug insurance and prescription drug cost-sharing on health outcomes (Adams et al., 2001; Eaddy et al., 2012; Gemmill et al., 2008; Gibson et al., 2005; Goldman et al., 2007; Kesselheim et al., 2015; Lexchin and Grootendorst, 2004; Luiza et al., 2015; Mann et al., 2014; Page et al., 2008; Sinnott et al., 2013). On the whole, there is consistent evidence that drug insurance improved health outcomes and that higher cost-sharing impacted health negatively.

Among the poor and those with chronic illnesses, higher drug cost-sharing was found to have reduced uptake of essential medications and in turn, this reduction was associated with the increased use of other services, including emergency services, nursing home admissions, and adverse events such as acute care admission, long-term care admission, and mortality. Lexchin and Grootendorst (2004) systematically reviewed studies that examined the effects of prescription drug cost-sharing on drug and health services use and on health in vulnerable populations (the poor and those with chronic illnesses). The effect of drug fees on health were observed indirectly from changes in the use of essential medications, or from the use of health services indicating poor health (e.g., hospitalizations). Overall, studies found that cost-sharing reduced the uptake of essential medications and in turn, this reduction was associated with the increased use of other services, including emergency services, nursing home admissions, and adverse events (e.g., acute care admission, long-term care admission, mortality). Goldman, Joyce and Zheng (2007) reviewed the effects of drug cost-sharing features on the use of prescriptions, health services, and health outcomes. For chronic conditions including congestive heart failure, lipid disorders, diabetes, and schizophrenia, studies consistently found that higher cost-sharing, copayments, or benefit caps were associated with increased use of other medical care such as emergency and inpatient services.

In publicly insured populations, the introduction of or increase in cost-sharing for prescription drugs reduced adherence to medicines (including essential medicines). Sinnott, Buckley et al. (2013) systematically reviewed and estimated the effect of introducing or increasing copayments for prescriptions on adherence to medicines in publicly insured populations. Results from their meta-analysis indicated an 11% increased odds of non-adherence among those publicly insured when required to copay for prescriptions compared to those not required to copay.

A number of studies have examined the effect of prescription drug insurance on health outcomes in the Canadian context. Kwan, Razzaq et al. (2008) estimated the effects of low SES and the absence of

supplemental drug insurance on using optimal diabetes care as identified by clinical guidelines, including medication adherence, blood glucose testing, and the purchase of healthy foods. Data were collected in 2006 in Ontario from a standardized telephone survey and respondents were stratified by SES and insurance status. The sample included 763 patients with diabetes selected by random-digit dialing, and 387 patients with diabetes selected from low-income neighbourhoods. The absence of supplemental insurance was an independent predictor for both skipping diabetes medications and blood glucose testing due to cost.

Bowker, Mitchell et al. (2004) examined whether patients with type 2 diabetes insured for blood glucose testing supplies were more likely than uninsured patients to self-monitor their glucose and whether they had better glycemic control. The sample included 405 patients recruited from community pharmacies in Alberta between 2001 and 2003, with survey and laboratory data drawn from their concurrent enrolment in a randomized controlled trial. Patients with insurance coverage for self-monitoring supplies (public or private) had significantly lower hemoglobin concentrations (i.e., better glycemic control) than those without insurance coverage (7.1 vs. 7.4%, respectively). Even after adjusting for individual characteristics, lack of insurance coverage for self-monitoring supplies was significantly associated with poorer glycemic control.

As discussed earlier, Québec's 1996 implementation of mandatory drug insurance presented an opportunity to examine the impact of cost-sharing on a variety of key outcomes. Tamblyn, Laprise et al. (2001) estimated the impact of introducing cost-sharing by examining (1) use of essential and less essential drugs and (2) rates of ED visits and serious adverse events (hospitalization, nursing home admissions, and mortality), before and after policy implementation. After the introduction of cost-sharing, the use of essential drugs decreased by 9% among elderly and by 14% among welfare recipients; and the use of less essential drugs decreased by 15% and 22%, respectively. ED visit rates, associated with reductions in the use of essential drugs, increased by 14% per 10 000 person-months for the elderly and by 54.2% for welfare recipients. The rate of adverse events, associated with reductions in the use of essential drugs, increased by 7% per 10 000 person-months for the elderly and by 13% for welfare recipients. Reductions in the use of less essential medications were not found to increase the risk of adverse events or ED visits. Wang, Li et al. (2015) evaluated the effects of Quebec's mandatory, universal prescription insurance on drug use, general practitioner (GP) and specialist visits, hospitalizations, and health outcomes, using difference-in-differences estimation. The sample was selected from the longitudinal household component of the NPHS and included 11 168 individuals aged 12 to 56, followed from 1994/95 up to 2003. Results indicated that the program had a small and positive effect on health outcomes as measured by the Health Utilities Index Mark 3 (HUI3) and self-assessment. Quantile regression suggested that improvements in health outcomes were concentrated among less healthy individuals.

Many reviews and Canadian-based studies have examined the impact of having both primary and supplementary insurance coverage, as well as the introduction of variations of cost-sharing on health outcomes. Studies that focus on the impact of having insurance coverage (both primary and supplementary) within publicly financed and funded healthcare systems are most relevant to the context of Ontario. The literature reviewed suggests that overall the introduction of a LIHB in Ontario could impact health outcomes

as well as utilization of healthcare services, including prescription drug services. All Canadians have some public insurance coverage; the introduction of a LIHB to provide primary insurance coverage for services not covered under OHIP, to an eligible segment of the population (low-income Ontarians – starting with children and youth) could be expected to increase utilization of services for which these individuals currently face any form of copayment. Expanded primary insurance coverage could also decrease utilization of acute care as well as long-term health expenditures.

Healthcare insurance coverage for services that currently require some form of cost-sharing could improve preventative service utilization, essential healthcare seeking behaviours, as well as downstream utilization, and ultimately health outcomes. Prescription drug insurance coverage or subsidization of prescription drug cost-sharing through supplementary insurance coverage could improve medication adherence and uptake of essential medications (for which there are copays). These effects for both general and prescription drug insurance coverage would likely have greater impacts for certain vulnerable populations (the elderly and the poor), those already experiencing chronic illness, and those without any insurance coverage for necessary and recommended and essential services outside of the realm of provincially provided public health insurance coverage. Thus, the LIHB, which aims to expand health insurance coverage for five benefit areas to low-income Ontarians– prescription drugs, vision care, assistive devices, mental health and dental care – would address those vulnerable as a result of socioeconomic status who have no or limited coverage for these service areas.

3.3.3. Impact of mental, allied, dental, and vision care insurance on health outcomes.

In the United States, mental health benefits legislations (i.e., legislation changing regulations for mental health insurance coverage to improve financial protection) were associated with improved mental health outcomes. Sipe, Finnie et al., (2015) systematically reviewed studies that examined the effects of mental health benefits legislation on mental health services and mental health outcomes in the US. Health outcomes included being diagnosed, morbidity, and mortality. Although only a small number of studies were available, mental health benefits legislations (especially comprehensive parity) was associated with favourable effects for health-related outcomes such as reducing suicides and self-reported poor health, and increasing diagnoses of mental illnesses.

We were unable to identify reviews that examined the impact of allied, dental, or vision care insurance on health outcomes. Some Canadian studies, however, have examined the impact of dental and vision care insurance on health outcomes. Locker, Maggrias and Quinonez (2011), using data from a national telephone survey conducted in 2008 among adults, examined associations between dental insurance and oral health outcomes and found that having private dental insurance increased the odds of reporting better oral health outcomes. Chan, Trope, et al. (2014) used data from the National Population Health Survey (NPHS) from 1994 to 2011 to examine the impact of lack of government-insured routine eye examinations on the incidence of self-reported glaucoma, cataracts, and vision loss. Chan et al. found that the lack of government-funded routine eye examinations was associated with a reduced incidence of self-reported glaucoma and cataracts, which was likely due to reduced detection. Lack of insurance was found to be associated with a higher

incidence of self-reported vision loss, which was likely due to poorer access to eye care and late treatment. Jin, Buys, et al., (2013) assessed whether lack of government-insured annual routine eye examinations was associated with reduced vision health status among elderly Canadians. Using the Canadian Community Health Survey 2000–2001, it was found that among low-income elderly, the prevalence of vision problems was greater in those with annual eye examinations uninsured by government compared with those insured.

In general, the introduction of supplementary insurance for dental and mental health, and vision care, improved healthcare outcomes for those with insurance coverage. As many allied healthcare services generally exist outside of many healthcare systems' insured benefits (both public and private), the impact of supplementary health insurance in Ontario would reflect supplementary insurance coverage in other settings. As a result of the variability of insurance coverage for allied healthcare, despite the publicly financed and funded nature of the Ontario healthcare system, the access to these services in the province reflects other similar contexts. Namely, an income gradient occurs for access and utilization of dental and mental healthcare, as well as for vision care. Introducing a LIHB for allied healthcare could increase preventative allied health service utilization and reduce later emergency utilization across the spectrum of dental and mental health, as well as vision care.

3.4. What is the impact of supplementary health insurance on labour market outcomes? Are there any socioeconomic differences in the impact of supplementary health insurance on labour market outcomes?

Key Messages

- Access to health insurance after retirement can facilitate early retirement;
- Access to spousal health insurance can reduce secondary earner labour force participation;
- A lack of affordable private health insurance may contribute to welfare lock (prevent welfare recipients from entering the workforce - also known as the welfare wall and the poverty trap);
- There is variability in effects of having health insurance on labour market outcomes across sub-populations; these effects are challenging to assess and interpret methodologically due to several concurrent targeted policies/interventions.

Evidence highlighting the effect of primary private health insurance on labour market outcomes such as labour supply, is predominantly based on data from the United States. This is due to the historic absence of a universal, publicly financed healthcare system in the United States and the country's reliance on a private health insurance market for insurance coverage (excluding Medicare and Medicaid, offered to individuals over 65 and to low-income individuals, respectively). We present a summary of findings from the literature on the effect of having health insurance on labour market outcomes, recognizing that the magnitude of the effect is likely smaller, with respect to supplementary health insurance, within a publicly financed and funded system. We anticipate the overall directionality would be similar for supplementary health insurance and primary health insurance as they both provide opportunities for health service insurance coverage, and typically are accessed through employer-based schemes. We anticipate that the magnitude of the impact of supplementary health insurance upon outcomes of interest, within the context of a publicly funded system will be smaller than those examining primary health insurance coverage in predominantly private-market systems.

3.4.1. Retirement hazard

With respect to labour force participation, there is evidence that access to health insurance reduced labour force participation for certain sub-populations, namely seniors and secondary earners in the household. There were differential effects across the income gradient; those with higher incomes or high-income spouses were at higher risk for retirement hazard than lower income counterparts. Seniors who have access to private health insurance that extends into retirement are more likely to take early retirement and having private health insurance influences retirement decisions (Currie and Madrian, 1999; Gruber, 2000). Because higher wages and the probability of health insurance are highly correlated (Currie and Madrian, 1999), there is an income effect such that high-income seniors are more likely to retire sooner - the literature estimates six to 24 months earlier (Gruber and Madrian, 2002). In a review of the retirement literature in the US., Coile (2015) concluded that access to health insurance after retirement can hasten retirement decisions but this effect is likely to be smaller in countries with a universal healthcare system. Introducing a low-income health benefit

may hasten retirement providing bridging insurance coverage to those prior to age 65 for those who are not eligible for the Ontario Drug Benefit (at which point eligibility would commence).

3.4.2. Secondary earners: household labour market outcomes

Secondary earners (primarily women) who are insured through spousal health insurance were found to be less likely to participate in the labour force (Gruber, 2000). The decision to participate in the labour force for secondary wage earners was influenced by the primary earner's access to private health insurance (Gruber and Madrian, 2002). Again, differential effects were found across the income gradient; health insurance was not a determinant of labour supply or welfare exits for low-income mothers as evidenced by the expansion of Medicaid insurance coverage having minimal effects on labour force participation rates for this population. In contrast, married women with high-income spouses were found more likely to have the option to forgo labour force participation, implying that they may also have more opportunities to pursue other activities including the home-based provision of labour (Gruber and Madrian, 2002). Thus introducing a low-income benefit may not impact upon the labour supply of low-income mothers who are already working in Ontario;⁴ whether the LIHB would have differential effects on secondary earners exiting their existing benefits may depend on the adequacy and cross-price effects of the insurance coverage received.

3.4.3. Labour market mobility

For low-income earners on social assistance, the lack of access to private health insurance can induce 'welfare lock' (fear of transitioning to the labour force participation due to the potential loss of health insurance). An individual receiving welfare can be made worse off by entering the workforce because they lose access to their publicly provided health insurance but are unlikely to gain access to affordable private insurance coverage (Gruber, 2000). There are mixed findings regarding the impacts of health insurance on labour market participation - Bitler and Zavodny (2014) found that the provision of and access to Medicaid has improved the participation of those enrolled, in welfare programs, it remains unclear whether Medicaid has either increased or decreased labour force participation. With respect to job lock (fear of transitioning to new employment due to the potential loss of insurance), health insurance was found to reduce labour force mobility, however many cite methodological concerns such as the use of proxies for insurance value that could reduce the strength of this evidence (Gruber and Madrian, 2002). While the findings pertaining to if and to what extent access to health insurance may impact on job lock are mixed, some agree that the evidence is more convincing that health insurance does reduce job mobility (Currie and Madrian, 1999; Gruber, 2000; Gruber and Madrian, 2002). Introducing a low-income health benefit may facilitate labour force mobility for low-income workers, as well as increased labour supply for those on social assistance benefits.

3.4.4. Wage effects

When health insurance is employer-based, the cost of health insurance is likely to be fully reflected in lower wages (Gruber, 2000). Employers who are not able to control costs through lower wages, control benefit costs either through their employee mix, replacing full-time employees who qualify for health insurance with part-

⁴ Studies reviewed examined low-income mothers vs. all women, and the impact of Medicare expansion on their labour supply. It is unclear if these results generalizeable to low-income women without dependents.

time employees who do not qualify for insurance, or by increasing the number of hours work per employee (Gruber, 2000). Others have found the link between wages and health insurance less clear and attribute the mixed results for wage offsets to identification problems that stem from an inability to separate health insurance from other factors that affect labour market outcomes (Currie and Madrian, 1999). There is some evidence, however, that employers offset some of their health insurance costs through increased hours of work per employee. The evidence on a trade-off between full-time and part-time employment is mixed.

Assessing the impact of having health insurance on labour market outcomes presents a methodological challenge for researchers in this area (Garrett and Chernew, 2008), due to the multiple public policies and interventions occurring concurrently across various populations. What is clear is the variability of findings across contexts and sub-populations, including low-income individuals and older individuals. The interpretation of this literature with respect to the (Ontarian) Canadian context should be approached with caution as the context and system infrastructure within which it is conducted has many fundamental differences. However, anticipating adverse labour market effects for low-income individuals ('welfare lock') in the absence of insurance coverage above the threshold of more fulsome financial/social assistance could be important in addressing low-income health benefits and supplementary private health insurance in this group.

3.5. How may employers respond to the introduction of publicly provided supplementary health insurance?

Key Messages

- Public provision of health insurance may crowd-out private health insurance;
- Employers may have contributed to the crowding-out through reduced insurance offers but the evidence is limited;
- The variation of the crowding-out effect is debated; controlling for confounders diminishes the magnitude of the effect;
- Crowding-out effects vary across the income gradient; raising the income threshold for public health insurance coverage increases demand for public health insurance (vs. employment-based private health insurance) for those newly eligible.

The evidence describing the response of employers to publicly provided supplementary health insurance largely addresses the phenomenon of ‘crowd out’. Crowd out in the health sector occurs when public investment in healthcare and health insurance reduces the scope of the private or employer-based health insurance market. Most of the literature on the employer response to an increased public scope of insurance coverage of healthcare is US-centric, and exploits health policy initiatives that resulted in expanded Medicaid or Medicare insurance coverage in the 1980s, 1990s and 2000s. While the infrastructure of the US health insurance system differs from that of a single public payer (such as in Canada), these data can inform how expanded public supplementary health insurance coverage impacts upon the private health insurance market, particularly how employers respond.

There is consensus in the literature that crowding-out occurs, however there is much disagreement as to the range or extent to which increased public health insurance coverage causes reduced private health insurance coverage through employers. Reviews examining the impact of expanded Medicaid and Medicare insurance coverage in the US provide estimates of the range of the crowding-out phenomenon span from 0-60% (Bitler and Zavodny, 2014); 25-50% (Blewett and Call, 2007); and 10-50% (Cutler, 2002). Much discussion has surrounded the methodology of estimating crowding-out, and some argue that the larger effect sizes stem primarily from assumptions made when modelling the effect (Davidson et al., 2004). When state-level controls (using the State Children’s Health Insurance Program or SCHIP) were used to explore what drives the large variation in crowding-out, the effect was reduced from approximately 56% to below 15% (Limpa-Amara et al., 2007).

Two mechanisms underlying the crowding-out phenomenon when public insurance coverage is expanded are the reduced demand for private health insurance, and the reduced supply by employers of private health insurance. Evidence is mixed as to if, and to what extent, the demand and supply-side private health insurance responses are impacted by expanded public insurance coverage. Employer response to increased public health insurance coverage ranges from zero effect (Cutler, 2002), to the reduction of offers of employer-based private health insurance if the workforce had a high proportion of Medicaid-eligible employees

(Marquis and Long, 2003; Shore-Sheppard et al., 2000). Employers were found to encourage low-income employees to enrol in SCHIP as an alternative source of health insurance coverage for their children, particularly if they were having difficulty paying their share of the family premium (Regopoulos and Trude, 2004). In response to Medicare Part D (a US prescription drug benefit somewhat similar to supplementary drug insurance coverage to seniors in Canada), which came into effect in 2006 for outpatient prescription medications, 1% of private firms planned to drop retiree private health insurance coverage, and 5% planned to drop prescription drug insurance coverage (Gabel et al., 2008).

Expanded public health insurance coverage was found to reduce employee response to private health insurance differently across populations. The uptake of the expanded public health insurance in the U.S. may be mediated by the benefit package provided for employee enrollees' children by their current private health insurance plan (Payne, 2009). The uptake of private health insurance is mediated by higher thresholds of income eligibility – higher thresholds of income eligibility results in greater crowd out (Blewett and Call, 2007). Higher wage earners, who are more likely to have access to employer-based private health insurance, drive a greater crowding-out effect (Davidson et al., 2004). When employers took anti-crowding-out measures, this discouraged both the privately insured as well as the uninsured from enrolling in the publicly provided insurance program (Blewett and Call, 2007).

While the data forming the basis for these reviews is US driven, findings can be applied to the Ontario context. Employee responses to public plan expansion moves in the expected direction – as income eligibility thresholds increase, there is greater uptake in the public plan, suggesting that low-income individuals will enrol when provided the opportunity. Evidence that employers may lower their private health insurance coverage in response to expanded drug insurance coverage is worth considering when implementing such a policy. Anti-crowding-out measures present a barrier to the uptake of publicly provided health insurance.

3.6. Tax subsidies and tax credits

Key Messages:

- Supplementary health insurance tax subsidies cost the government of Canada \$6.9 billion in forgone revenue in 2014;
- On net, tax subsidies are not tax-saving;
- In Canada, a 1% increase in the after-tax price for supplementary health insurance is expected to decrease demand by approximately 0.5%.
- International experiences with partially or fully removing tax subsidies is mixed;
- Tax subsidies increase inequalities in supplemental health insurance coverage;
- Firms may respond to changes in tax subsidies by altering the amount and quality of supplemental insurance offered to their employees;
- Smaller employers are more sensitive to changes in tax subsidies than larger employers;
- Tax subsidies may lead to adverse selection.

3.6.1. *How much do tax subsidies and tax credits for supplementary private health insurance cost Ontario/Canada? On net, are tax subsidies tax-saving?*

Health-related tax expenditures in Canada include non-taxation of employer-paid health and dental benefits, medical expense tax credit, refundable medical expense supplement for low-income working Canadians, disability tax credit, GST/HST zero-rating for medical devices and prescription drugs, GST/HST exemption for healthcare services, GST/HST rebate for hospitals, and children's fitness tax credit; accounting for a total of \$6.9 billion in forgone revenue in 2014 (Health Canada, 2015). More specifically, the non-taxation of employer-paid health and dental benefits amounted to \$2,520 million nationally in 2013 (Health Canada, 2015). In Ontario, retail sales tax exemption of health insurance premiums cost the province more than \$500 million (Ontario Ministry of Finance, 2014).

3.6.2. *On net, are tax subsidies tax-saving?*

In countries where private health insurance competes with a publicly financed healthcare system, tax subsidies were consistently found not to be tax saving after factoring in price inelasticity of demand for private insurance coverage and concurrent use of private and public systems (Emmerson et al., 2000, 2001; Lopez Nicolas and Vera-Hernandez, 2008; Mossialos and Thomson, 2004; Stabile and Thomson, 2014). That is to say, an increase in the price of private health insurance (as might be expected after removing tax subsidies) led to a less-than-proportional drop in demand for private health insurance – all while having little effect on the demand for publicly funded services. One of the more widely cited examples of this effect occurred in Australia, where tax subsidies led to an increase in take-up rates of private insurance by sicker users, but any cost savings to the public sector due to this effect did not offset the costs of the subsidies themselves (Hurley et al., 2002; Lu and Savage, 2006; Stabile and Thomson, 2014). In fact, it can be expected that reducing subsidies for private health insurance in Australia would generate net cost-savings (Cheng, 2014). In the Canadian context of supplementary private health insurance, government subsidies to employer-provided private health insurance may indirectly increase the cost of certain publicly financed healthcare services. This

is because individuals that held supplemental health insurance in Canada used approximately 10% more publicly funded physician services than those who did not, about half of which was attributed to moral hazard (Stabile, 2001). This figure is supported by research indicating that Ontarians that held private drug insurance in 2005 were approximately 5% more likely to have visited a general practitioner and 7% more likely to have visited a specialist (Allin and Hurley, 2009).

3.6.3. How responsive is the demand for private supplementary health insurance to changes in its tax treatment (i.e., the extent to which it is tax deductible)? Are there any socioeconomic differences?

Three studies have investigated the tax price elasticity of demand for medical care (e.g., health services, drugs), or the percent change in demand for every one percent increase in tax price, in the Canadian context. Smart and Stabile (2005) using an instrumental variable approach, examined a series of federal and provincial tax policy changes with consumption data from household spending surveys. The results indicated a tax price elasticity of demand for medical care ranging between -0.3 and -0.9 for individual health expenditures. Because many of the tax changes under study were tax credits, which would only partially refund expenses after a lengthy delay, findings indicating elasticity on par with the RAND health insurance experiment's elasticity of demand from cost-sharing (at the point of service) were unexpected. An earlier study of the elasticity of demand by Stabile (2001) examined variation between individual marginal tax rates and interacted these characteristics with residence in Québec – the only province not to exclude employer-provided private health insurance from taxation. This “semi-price elasticity of demand” for employer-provided supplementary health insurance was estimated to be about -0.4, which would imply a decline of 13 to 20% in insurance coverage of supplementary health insurance across Canada if all subsidies were removed. The third major study by Finkelstein (2002) investigated Québec's 60% reduction in subsidies for employer-provided private health insurance in 1993 as a natural experiment using a difference-in-differences approach with other provinces as comparators. Following this policy change, employer-provided private health insurance coverage exhibited a tax price elasticity of about -0.5. There was a small increase in non-group insurance coverage, but this only offset 10-15% of the decrease in employer-provided insurance coverage. Therefore, all three major studies of tax price elasticity of demand for supplemental health insurance in Canada suggested a decrease in demand of about 0.5% for every 1% rise in tax price.

The United Kingdom removed tax subsidies for private health insurance for persons over the age of 60 in 1997, leading to a 30% increase in price to the consumer on average. The subsidies had originally been associated with a small 1.6% increase in insurance coverage, but the subsequent removal of subsidies resulted in a concordant drop in private health insurance coverage of 0.7% over one year, implying a very inelastic (-0.024) price elasticity of demand (Emmerson et al., 2000). After reduction of tax subsidies in Ireland, the cost of private health insurance rose by approximately 40%, but insurance coverage rates continued to grow due to concurrent economic growth and a shift in public demand from public to private insurance coverage in a period of deregulation (Colombo and Tapay, 2004; Department of Health and Children, 1999; Harmon and Nolan, 2001). A microsimulation of removing tax subsidies of group health insurance in the US suggested a drop in take-up ratio of employer subsidized insurance from 99 to 57%, leaving a sicker population under insurance coverage, and more than doubling premiums (Jeske and Kitao, 2007). In Australia, the elasticity of

demand for private health insurance has been found to be in the range of -0.32 to -0.35, and a policy reform in 1997 allowing for a 30% premium subsidy resulted in an increase of private health insurance coverage of 35% (Cheng, 2014; Palangkaraya et al., 2009).

Overall, tax subsidies have increased insurance coverage rates of private health insurance at significant public expense, and at the cost of reduced equity (Bhatti et al., 2007; Canadian Academy of Health Sciences, 2014; Stabile and Thomson, 2014). Both principal empirical studies that found negative tax price elasticities of demand in Canada also found a significant positive correlation of income with supplementary health insurance coverage (Smart and Stabile, 2005; Stabile, 2001). This implies an inequity in the distributive effects of tax subsidies for supplementary health insurance tax subsidies. This is supported by evidence that a full 30% (\$900 million per year) of Australia's subsidy has been found to be a windfall gain for individuals that would have purchased insurance regardless of the subsidy (Palangkaraya et al., 2009).

3.6.4. How do employers respond to changes in tax subsidies for supplementary private health insurance? Are there any differences by firm size?

Non-taxation of private health insurance led to higher growth in compensation through these benefits than growth in salaries (Health Canada, 2015; Stabile, 2002). There appeared to be no effect of tax subsidies on the intensive margin for health insurance premiums (leaving the relative price of private insurance offered by employers unchanged) due to equal credits to both out-of-pocket expenses and private insurance coverage (Smart and Stabile, 2005). Tax reform in Québec that removed approximately 60% of total tax subsidies resulted in a 13-14% decrease in supplemental insurance coverage through the workplace, or a -0.46 to -0.49 tax price elasticity for group insurance coverage (Finkelstein, 2002). Firms' price elasticity of demand for private insurance in the US has been estimated to be -0.25 for offering insurance and -0.7 for insurance spending (Gruber and Lettau, 2004). An older study determined that eliminating tax subsidies in the US would decrease demand for first-dollar insurance coverage from employers by about 20% (Marquis and Phelps, 1987). A special case of Spanish tax reform in 1998 which eliminated a 15% tax deduction for individual PMI resulted in a transfer of 10% of individual insurance coverage to employer-based group insurance coverage, without increasing public system use while lowering foregone revenue (Rodriguez and Stoyanova, 2008).

Small firms are more sensitive to changes in subsidies. This is driven by smaller firms' larger elasticity of demand (greater than -0.5) (Gruber and Lettau, 2004). A separate model estimated that if subsidies were eliminated, small firms' insurance coverage levels would decrease by 50% compared to large firms - an effect backed by evidence from the Québec experience (Finkelstein, 2002; Stabile, 2002). Overall, workers in large firms would continue to purchase private insurance through group insurance coverage due to economies of scale, but workers in smaller firms would either purchase insurance coverage on the individual market, through another family member, or forego insurance coverage altogether. The difference between insurance coverage rates in small and large firms in Québec is seven percentage points larger than the rest of Canada (Stabile, 2002).

3.6.5. Do changes in tax subsidies for supplementary private health insurance change the composition of insurance pools, and if so, to what extent?

In theory, removing tax subsidies for group insurance may lead to a sicker population retaining insurance coverage when individual insurance coverage is an option, because healthy agents will seek out lower premiums on the individual insurance market (Jeske and Kitao, 2007). This is supported by a simulation from the US, which suggested that removing tax subsidies may lead to adverse selection and destabilization of supplementary health insurance markets (Marquis and Phelps, 1987). It is also argued that the degree to which “wealth effects” lead to lower sensitivity to the monetary consequences of illness can offset “demand effects” of greater insurance coverage, leading to moral hazard in insurance markets, but model assumptions of lower preventative care use among higher income groups are questionable (Jaspersen and Richter, 2015). Besides these theoretical and simulation models of changes to insurance pools due to tax subsidies, there does not seem to be any evidence from Canada and little evidence of any empirical effect internationally.

The evidence reviewed suggests that tax subsidies for employer provision of supplemental health insurance do not necessarily achieve cost-savings to the government, or a more equitable distribution of private health insurance. Through examples provided in the province of Québec, as well as in Australia, the impact of subsidizing employer-provided health insurance coverage upon equitable access and utilization of healthcare across the income gradient is largely dependent on the size of the employee-payer pool. Tax subsidies of private, supplementary health insurance may also increase the cost to the public payer (in Ontario, OHIP), through the increase in utilization of publicly financed healthcare services. Because simulation models of the effects of removing/introducing tax subsidies for employer group insurance premiums are highly sensitive to empirical assumptions made, these effects remain ambiguous. Overall, the impacts that tax subsidies of supplemental health insurance would have upon employees in Ontario is unclear. If the LIHB were to include tax subsidies of certain services outside of the defined benefit package provided by the province or employer, the foregone revenue in a low-income population may not offset the potential short-run health expenditure increase. However, in the long-run tax subsidies may enable smaller employers and employers with informal employees to access health insurance coverage that may improve essential healthcare service utilization.

3.7. Alternative cost-sharing designs: value-based insurance design

What is the impact of value-based insurance design on utilization, costs and health outcomes? Are there any socioeconomic differences in the impact of value-based insurance design on utilization, costs and health outcomes?

Key messages:

- Existing evidence suggests that value-based insurance design (VBID) policies had an impact on utilization; in particular, VBID policies were consistently associated with improved medication adherence;
- Emerging evidence suggests that value-based insurance design policies were associated with a reduction in patient out-of-pocket costs for VBID services;
- There is limited and mixed evidence that value-based insurance design programs improved health outcomes.

An alternative cost-sharing design called “value-based cost-sharing” or more generally “value-based insurance design” is gaining popularity in the United States. Value-based insurance design is “an approach that attempts to improve the quality of care by selectively encouraging or discouraging the use of specific health care services, based on their potential benefit to patients' health, relative to their cost (Lee et al., 2013 p. 1251)”. A key feature of value-based insurance design is to link the amount of cost-sharing across services with the documented effectiveness and cost-effectiveness of a service, drug or device. Thomson, Schang, and Chernew (2013) summarized existing value-based cost-sharing policies in the US and selected western European countries. Value-based cost-sharing policies were used in three broad policy areas. First, lower cost-sharing was used for choosing preferred providers (based on quality or cost criteria). Second, value-based approaches to cost-sharing were used for outpatient prescriptions based on either (or a combination) of: economic evaluation, therapeutic value, clinical indication (defined by disease category or patient need), or the price of the drug in relation to substitutes (i.e., reference pricing). Third, valued preventive services such as immunization were often exempted from cost-sharing. In addition to foregoing cost-sharing, specific financial incentives were sometimes used in an attempt to change behaviour (e.g., increased participation in health-promoting activities such as exercise classes).

A growing number of reviews have examined the impact of value-based cost-sharing policies on utilization, costs and health outcomes. Fendrick, Martin and Weiss (2012) reviewed the literature on value-based insurance design and examined specifically the effect of value-based cost-sharing on the use of high-value services. Fendrick et al., found that the available (albeit quite limited) evidence suggested that patients responded to both increases and decreases in out-of-pocket costs when it came to the use of essential medical services. Ogbechie and Hsu (2015) systematically reviewed studies that examined the effects of health insurance benefit designs that changed the price difference between prescription drugs representing potential clinical substitutes. On the whole, it was found that differential cost-sharing led some patients to switch to the cheaper drug option but, on average, out-of-pocket spending increased. Few studies, however, examined the effects of these designs on sub-groups, such as the elderly or patients with multiple comorbidities. Lee, Maciejewski et al. (2013) systematically reviewed studies that examined the effects of value-based insurance

design policies on medication adherence and medical expenditures. Thirteen studies were included and, on the whole, found that the value-based insurance design policies were consistently associated with improved adherence, as well as with lower out-of-pocket spending for drugs. Policies that provided more generous insurance coverage were not found to lead to significant changes in overall medical spending for patients and insurers. Choudry, Fischer et al. (2014) evaluated using an interrupted time-series approach seventy-six value-based insurance plans introduced by a large pharmacy benefit manager during 2007–10. Value-based insurance plans that were more generous, targeted high-risk patients, offered wellness programs, did not offer disease management programs, and made the benefit available only for medication ordered by mail were found to have a significantly greater impact on adherence than plans without these features. Tang, Barnieh et al. (2014) conducted a systematic review with the objective to determine the association between value-based insurance design and medication adherence, clinical outcomes, healthcare utilization, and spending in patients with or at risk for cardiovascular chronic diseases. Ten studies met inclusion criteria (one high-quality randomized controlled trial, one interrupted time series analysis, and eight controlled before-and-after studies). Value-based insurance design was found to be associated with improved medication adherence. Its effects on clinical outcomes, healthcare utilization, and spending were uncertain.

Look (2015) conducted a methodological review of studies that examined the impact of value-based insurance programs on medical adherence. A total of 20 studies that assessed the effects of 17 value-based insurance programs were reviewed. Value-based insurance programs were found to generally improve medication adherence. Look, however, argued that existing studies suffered from important methodological limitations and considerable caution was needed when interpreting results.

Green, Maclure et al. (2010) systematically reviewed studies that examined the effects of a pharmaceutical policies that sought to restrict the reimbursement of selected medications (not cost-sharing) on drug use, health services utilization, health outcomes and costs (expenditures). Policies restricting reimbursement on certain drugs (especially those with cheaper, effective alternatives), were found to reduce costs without increases in the use of other health care services. For example, six studies found that restrictions on gastric acid suppressants and NSAIDs decreased drug use without increasing the use of other health services for up to two years after the policy change.

In Ontario, VBID as a price signal mechanism within the LHIB on the demand side, could improve the cost-effective use of healthcare services and technologies for those eligible. However, the use of cost-sharing versus reimbursement mechanisms could have important implications for short and long-run healthcare service utilization rates — reimbursement policies could direct individuals to more cost-effective care without increasing demand for other healthcare services downstream. In general, VBID could improve medication adherence within the context of other plan features, however the evidence is somewhat contradictory and highly sensitive to overall plan features, design and implementation setting. The literature reviewed is inconclusive as to how VBID as a feature of the LHIB in Ontario would affect healthcare utilization, payer (OHIP) cost and health outcomes of Ontarians.

4. DISCUSSION

4.1. Summary of main findings

Who has private supplementary health insurance?

There is a strong positive relationship between income and private health insurance. The relationship between age and having private health insurance is tempered by the onset of expanded coverage at certain age thresholds (e.g. in Ontario, age 65 for prescription drugs under the Ontario Drug Benefit Program).

What is the impact on health service utilization?

There is strong evidence that having both primary and supplemental health insurance increases the utilization of health services including, outpatient, inpatient, dental, and vision care and allied healthcare services as well as prescription drugs. Increasing cost-sharing for any healthcare service at the point of use, in contexts with and without universal public health insurance coverage, decreased rates of essential and non-essential drug treatment, adherence to medication regimens, and service use.

Differential effects across populations

Overall, low-income individuals may be more sensitive to prices they face at the point of access for healthcare services, while those with chronic illness may be less sensitive to price. The evidence is, however, surprisingly mixed and limited.

Can value-based cost-sharing reduce the utilization of low-value services?

The evidence reviewed, largely from studies conducted in the United States, suggests that value-based insurance design (VBID) policies were consistently associated with improved medication adherence, and lower patient out of pocket costs for VBID services. Existing evidence, however, did not address the provision of otherwise effective services in contexts where they are not effective — a key issue to the Canadian context.

Does having health insurance impact health outcomes?

On the whole, existing evidence strongly suggests that the expansion of primary health insurance improved health outcomes and that health improvements were larger among vulnerable groups (e.g., the poor, the sick and the elderly). Conversely, higher cost-sharing was found to impact health negatively, particularly among the most vulnerable, and results in adverse events such as acute care admission, long-term care admission, and mortality.

How do health insurance arrangements impact the labour market?

Access to health insurance after retirement can facilitate early retirement and access to spousal health insurance can reduce secondary earner labour force participation. Additionally, welfare lock can occur as a result of a lack of affordable private health insurance (prevent welfare recipients from entering the workforce - also known as the welfare wall and the poverty trap). With increased public coverage, employment-based private health insurance coverage may be crowded out. Raising the income threshold for public health insurance coverage increases demand (for public insurance) for those newly eligible.

How do health insurance tax subsidies impact on employers and the tax base?

Tax subsidies are often provided to employers who purchase supplementary health insurance, however these cost the government of Canada \$6.9 billion in forgone revenue in 2014, while Ontario's retail sales tax exemption for individual life and health insurance premiums cost the province about \$625 million. On net, tax subsidies for health insurance are not tax-saving and may increase inequalities in supplemental health insurance coverage (i.e., tax subsidies provide larger tax savings to the wealthy relative to the poor which increases their likelihood of having private supplemental coverage). In Canada, a 1% increase in the after-tax price for supplementary health insurance is expected to decrease demand by approximately 0.5%. Employers may respond to changes in tax subsidies by altering the amount and quality of supplemental insurance offered to their employees, and smaller organizations are likely more sensitive to tax subsidy changes than larger ones. In other words, tax subsidies financially incentivize employers to purchase supplementary health insurance and the loss of these subsidies would likely result in lower demand or purchasing levels. Employers therefore may respond to changes in tax subsidies by altering the amount and quality of supplemental insurance offered to their employees, and smaller employers are more sensitive to tax subsidy changes than larger employers.

4.2. Strengths and limitations

Our review is not a systematic review. Consequently, a number of limitations are important to keep in mind when interpreting results. First, we did not use an a priori design (i.e., we did not write and publish a protocol before embarking on this review). Second, we did not conduct duplicate study selection and data extraction. Third, we extracted study characteristics for most but not all the included studies. Fourth, and most importantly, we did not formally and systematically assess the scientific quality of the included studies. Our study has a number of strengths. First, our search strategy was comprehensive. Second, we reviewed both reviews and individual studies that had used Canadian data. Third, our review is particularly broad: we examined the characteristics of individuals who reported having private supplementary health insurance; the effects of health insurance / cost-sharing on utilization, health and labour market outcomes; how employers respond to the public provision of health insurance; the role of tax subsidies and credits; and, value-based insurance design, an alternative cost-sharing design that has received much attention recently. And throughout our review, we paid special attention to effects that might differ across socioeconomic status.

4.3. Implications for policy and research

What could this mean for Ontario's Low-Income Health Benefit (LIHB)

- Introducing a low-income health benefit in Ontario would likely increase the use of (essential/ appropriate) healthcare services for those who had otherwise faced cost-sharing at the point of care. This includes preventative and primary healthcare use, as well as prescription drug use.
- Expanded prescription drug insurance coverage or subsidization of prescription drug cost-sharing through supplementary insurance coverage would almost certainly improve medication adherence and uptake of essential medications (for which there are copays).
- Expanded insurance coverage could decrease 'downstream' utilization of acute care services – the effect on total health expenditure is unclear.

- Vulnerable populations (the elderly, poor and chronically ill), would likely experience a greater impact of expanded coverage in terms of improved health outcomes.
- Vulnerable populations would likely experience a greater reduction in out-of-pocket costs faced as a proportion of income, than the general population.
- Employee responses to public plan expansion suggest that as income eligibility thresholds increase, there is greater uptake by low-income individuals in the public plan.
- Current tax subsidies to employers available for the purchase of supplementary health insurance may increase the cost to the public payer (in Ontario, OHIP) as supplemental insurance coverage (e.g., drug insurance) may increase the utilization of publicly financed healthcare services.

Implications for research

Evidence reviewed and described suggests that a LIHB could have variable effects across Ontarians, namely for certain population sub-types such as the ‘working poor’, the chronically ill and other vulnerable populations. Our scoping review suggests three key areas for further exploration:

1. a more systematic and quantitative approach to better understand the likely impact of expanding prescription drug insurance in the Canadian context;
2. an examination of the probable effect of value-based insurance design in the Canadian context as existing evidence do not address the provision of otherwise effective services in contexts where they are not effective;
3. evaluating the effects of LIHB on the use of healthcare services already covered under OHIP after it is implemented.

Our interest has been to examine and understand the relationships between supplementary health insurance and its effects on various health system and non health system-related outcomes, as well as on the outcomes of populations the health systems served. Ultimately knowing how having different degrees of health insurance coverage and facing various forms of cost-sharing impacts population health outcomes can inform policy design to improve population health outcomes. As we found substantive evidence that these impacts are differential across vulnerable, sub-populations such as low-income individuals, elderly individuals, and those with chronic illnesses, when compared with the general population, further exploration is warranted into the mechanisms propagating healthcare and health outcome trajectories across groups.

The context that healthcare systems operate in, as well as their design and delivery, is important in considering our outcomes of interest. Further prospective, longitudinal, and experimental or quasi-experimental research is needed, extending the findings of the RAND HIE in contexts with various levels of ‘universal’, public health insurance coverage.

5. REFERENCES

- Adams AS, Soumerai SB, Ross-Degnan D. The case for a medicare drug coverage benefit: a critical review of the empirical evidence. *Annu Rev Public Health* 2001;22; 49-61.
- Allin S, Hurley J. Inequity in publicly funded physician care: what is the role of private prescription drug insurance? *Health Econ* 2009;18; 1218-1232.
- Allin S, Laporte A. Socioeconomic Status and the Use of Medicines in the Ontario Public Drug Program. *Canadian Public Policy* 2011;37; 563.
- Allin S, Law MR, Laporte A. How does complementary private prescription drug insurance coverage affect seniors' use of publicly funded medications? *Health Policy* 2013;110; 147-155.
- Atherly A. Supplemental Insurance: Medicare's Accidental Stepchild. *Medical Care Research and Review* 2001;58; 131-161.
- Baicker K, Goldman D. Patient Cost-Sharing and Healthcare Spending Growth. *Journal of Economic Perspectives* 2011;25; 47-68.
- Barnes S, Abban V, Weiss A. Low Wages, No Benefits Expanding Access To Health Benefits For Low Income Ontarians. The Wellesley Institute: Toronto; 2015.
- Beck RG, Horne JM. Utilization of Publicly Insured Health Services in Saskatchewan Before, During and After Copayment. *Medical Care* 1980;18; 787-806.
- Bendall D, Asubonteng P. The effect of dental insurance on the demand for dental services in the USA: a review. *J Manag Med* 1995;9; 55-68.
- Bhatti T, Rana Z, Grootendorst P. Dental Insurance, Income and the Use of Dental Care in Canada. Canadian Dental Association. *Journal* 2007;73; 57.
- Bitler MP, Zavodny M. Medicaid: A Review of the Literature. NBER Working Papers No.20169. National Bureau of Economic Research; 2014.
- Blais L, Boucher JM, Couture J, Rahme E, LeLorier J. Impact of a cost-sharing drug insurance plan on drug utilization among older people. *J Am Geriatr Soc* 2001;49; 410-414.
- Blais L, Couture J, Rahme E, LeLorier J. Impact of a cost sharing drug insurance plan on drug utilization among individuals receiving social assistance. *Health Policy* 2003;64; 163-172.
- Blewett LA, Call KT. Revisiting Crowd-Out. Robert Wood Johnson Foundation, The Synthesis Project: Princeton; 2007.
- Bowker SL, Mitchell CG, Majumdar SR, Toth EL, Johnson JA. Lack of insurance coverage for testing supplies is associated with poorer glycemic control in patients with type 2 diabetes. *Canadian Medical Association Journal* 2004;171; 39-43.
- Buchmueller TC, Grumbach K, Kronick R, Kahn JG. The effect of health insurance on medical care utilization and implications for insurance expansion: a review of the literature. *Med Care Res Rev* 2005;62; 3-30.
- Caetano PA, Raymond CB, Morgan S, Yan L. Income-based drug coverage in British Columbia: the impact on access to medicines. *Healthc Policy* 2006;2; e154-169.
- Canadian Academy of Health Sciences. Improving Access To Oral Health Care For Vulnerable People Living In Canada. Canadian Academy of Health Sciences: Ottawa; 2014.
- Chan CH, Trope GE, Badley EM, Buys YM, Jin Y-P. The impact of lack of government-insured routine eye examinations on the incidence of self-reported glaucoma, cataracts, and vision loss. *Invest Ophthalmol Vis Sci* 2014;55; 8544-8549.
- Cheng TC. Measuring the effects of reducing subsidies for private insurance on public expenditure for health care. *J Health Econ* 2014;33; 159-179.

Choudhry NK, Fischer MA, Smith BF, Brill G, Girdish C, Matlin OS, Brennan TA, Avorn J, Shrank WH. Five features of value-based insurance design plans were associated with higher rates of medication adherence. *Health Aff (Millwood)* 2014;33; 493-501.

Coile CC. Economic Determinants of Workers' Retirement Decisions. *Journal of Economic Surveys* 2015;29; 830-853.

Colombo F, Tapay N. Private Health Insurance in Ireland: A Case Study. OECD health working paper No. 10.DELSA/ELSA/WD/HEA(2004)1. Organisation for Economic Co-operation and Development: Paris; 2004.

Contoyannis P, Hurley J, Grootendorst P, Jeon S-H, Tamblyn R. Estimating the price elasticity of expenditure for prescription drugs in the presence of non-linear price schedules: an illustration from Quebec, Canada. *Health Econ* 2005;14; 909-923.

Currie J, Madrian BC. Health, health insurance and the labor market. *Handbook of labor economics*, vol. 3. 1999. p. 3309-3416.

Cutler DM. Chapter 31 Health care and the public sector. In: Arrow KJ, Intriligator MD (Eds), *Handbook of Public Economics*, vol. 4. Elsevier; 2002. p. 2143-2243.

Davidson G, Blewett L, Call K, Williams C. Public program crowd-out of private coverage: What are the issues? Research Synthesis Report No. 5. The Synthesis project. Robert Wood Johnson Foundation, The Synthesis Project: Princeton; 2004. p. 965-974.

Department of Health and Children. White Paper - Private Health Insurance. Government of Ireland: Dublin; 1999.

Devlin RA, Sarma S, Zhang Q. The role of supplemental coverage in a universal health insurance system: Some Canadian evidence. *Health Policy* 2011;100; 81-90.

Dewa CS, Hoch JS, Steele L. Prescription drug benefits and Canada's uninsured. *International Journal of Law and Psychiatry* 2005;28; 496-513.

Dormuth CR, Glynn RJ, Neumann P, Maclure M, Brookhart AM, Schneeweiss S. Impact of two sequential drug cost-sharing policies on the use of inhaled medications in older patients with chronic obstructive pulmonary disease or asthma. *Clin Ther* 2006;28; 964-978; discussion 962-963.

Dormuth CR, Neumann P, Maclure M, Glynn RJ, Schneeweiss S. Effects of prescription coinsurance and income-based deductibles on net health plan spending for older users of inhaled medications. *Med Care* 2009;47; 508-516.

Duncan L, Bonner A. Effects of Income and Dental Insurance Coverage on Need for Dental Care in Canada. *Journal of the Canadian Dental Association* 2014;80.

Eaddy MT, Cook CL, O'Day K, Burch SP, Cantrell CR. How patient cost-sharing trends affect adherence and outcomes: a literature review. *P T* 2012;37; 45-55.

Emmerson C, Frayne C, Goodman A. Pressures in UK healthcare: challenges for the NHS. Institute for Fiscal Studies: London; 2000.

Emmerson C, Frayne C, Goodman A. Should private medical insurance be subsidised? *Health Care UK* 2001;Spring; 49-65.

Fendrick AM, Martin JJ, Weiss AE. Value-based insurance design: more health at any price. *Health Serv Res* 2012;47; 404-413.

Finkelstein A. The effect of tax subsidies to employer-provided supplementary health insurance: evidence from Canada. *Journal of Public Economics* 2002;84; 305-339.

Freeman JD, Kadiyala S, Bell JF, Martin DP. The causal effect of health insurance on utilization and outcomes in adults: a systematic review of US studies. *Med Care* 2008;46; 1023-1032.

- Gabel J, Whitmore H, Pickreign J. Retiree Health Benefits After Medicare Part D: A Snapshot of Prescription Drug Coverage. The Commonwealth Fund; 2008.
- Garrett B, Chernew M. Health insurance and labor markets: concepts, open questions, and data needs. *Inquiry : a journal of medical care organization, provision and financing* 2008;45; 30-57.
- Gemmill MC, Costa-Font J, McGuire A. In search of a corrected prescription drug elasticity estimate: a meta-regression approach. *Health Econ* 2007;16; 627-643.
- Gemmill MC, Thomson S, Mossialos E. What impact do prescription drug charges have on efficiency and equity? Evidence from high-income countries. *Int J Equity Health* 2008;7; 12.
- Gibson TB, Ozminkowski RJ, Goetzel RZ. The effects of prescription drug cost sharing: a review of the evidence. *Am J Manag Care* 2005;11; 730-740.
- Goldman DP, Joyce GF, Zheng Y. Prescription drug cost sharing: associations with medication and medical utilization and spending and health. *JAMA* 2007;298; 61-69.
- Green CJ, Maclure M, Fortin PM, Ramsay CR, Aaserud M, Bardal S. Pharmaceutical policies: effects of restrictions on reimbursement. *Cochrane Database Syst Rev* 2010; CD008654.
- Grootendorst PV, O'Brien BJ, Anderson GM. On becoming 65 in Ontario. Effects of drug plan eligibility on use of prescription medicines. *Med Care* 1997;35; 386-398.
- Gruber J. Health insurance and the labor market. *Handbook of health economics*, vol. 1. 2000. p. 645-706.
- Gruber J. *The Role of Consumer Copayments for Health Care: Lessons from the RAND Health Insurance Experiment and Beyond*. Henry J. Kaiser Foundation: Menlo Park, CA; 2006.
- Gruber J, Lettau M. How elastic is the firm's demand for health insurance? *Journal of Public Economics* 2004;88; 1273-1293.
- Gruber J, Madrian BC. *Health Insurance, Labor Supply, and Job Mobility: A Critical Review of the Literature*. National Bureau of Economic Research, Inc, NBER Working Papers: 8817; 2002.
- Hadley J. Sicker and Poorer--The Consequences of Being Uninsured: A Review of the Research on the Relationship between Health Insurance, Medical Care Use, Health, Work, and Income. *Med Care Res Rev* 2003;60; 3S-75.
- Hanley GE, Morgan S, Barer M, Reid RJ. The redistributive effect of the move from age-based to income-based prescription drug coverage in British Columbia, Canada. *Health Policy* 2011;101; 185-194.
- Harmon C, Nolan B. Health insurance and health services utilization in Ireland. *Health Econ* 2001;10; 135-145.
- Health Canada. *Unleashing Innovation: Excellent Healthcare for Canada*. Health Canada: Ottawa, Ontario; 2015.
- Holst J. Patient cost sharing: Reforms without evidence. Theoretical considerations and empirical findings from industrialized countries, WZB Discussion Paper, No. SP I 2010-303. Wissenschaftszentrum Berlin für Sozialforschung (WZB): Berlin; 2010.
- Hurley J, Johnson M. *A Review of Evidence Regarding Parallel Systems of Public and Private Finance*. CHEPA Working Paper Series, Working Paper 14-02. Centre for Health Economics and Policy Analysis, McMaster University; 2014.
- Hurley J, Vaithianathan R, Crossley TF, Cobb-Clark DA. *Parallel Private Health Insurance in Australia: A Cautionary Tale and Lessons for Canada*. Discussion Paper No. 515. Institute for the Study of Labor (IZA): Bonn; 2002.
- Hurley JE. *Health Economics*. McGraw-Hill Ryerson: Toronto; 2010.
- Hux JE, Kopp A, Mamdani MM. Turning 65 in Ontario: the impact of public drug benefit coverage on hospitalizations for acute and chronic disease. *Health Policy* 2006;1; 87-98.

- Institute of Medicine (US) Committee to Study the Role of Allied Health Personnel. *Allied Health Services: Avoiding Crises*. National Academies Press: Washington (DC); 1989.
- Jaspersen JG, Richter A. The wealth effects of premium subsidies on moral hazard in insurance markets. *Eur Econ Rev* 2015;77; 139-153.
- Jeske K, Kitao S. US tax policy and health insurance demand: Can a regressive policy improve welfare? Working Paper No. 2007-13. Federal Reserve Bank of Atlanta: Atlanta; 2007.
- Jin Y-P, Buys YM, Hatch W, Trope GE. De-insurance in Ontario has reduced use of eye care services by the socially disadvantaged. *Can J Ophthalmol* 2012;47; 203-210.
- Jin Y-P, Buys YM, Xiong J, Trope GE. Government-insured routine eye examinations and prevalence of nonrefractive vision problems among elderly. *Can J Ophthalmol* 2013;48; 167-172.
- Kapur V, Basu K. Drug coverage in Canada: who is at risk? *Health policy* 2005;71; 181-193.
- Kephart G, Skedgel C, Sketris I, Grootendorst P, Hoar J. Effect of copayments on drug use in the presence of annual payment limits. *Am J Manag Care* 2007;13; 328-334.
- Kesselheim AS, Huybrechts KF, Choudhry NK, Fulchino LA, Isaman DL, Kowal MK, Brennan TA. Prescription Drug Insurance Coverage and Patient Health Outcomes: A Systematic Review. *American Journal of Public Health* 2015;105; E17-E30.
- Kiil A. What Characterises the Privately Insured in Universal Health Care Systems? A Review of the Empirical Evidence. *Health Policy* 2012;106; 60-75.
- Kiran T, Kopp A, Moineddin R, Victor JC, Campbell RJ, Shah BR, Glazier RH. Unintended consequences of delisting routine eye exams on retinopathy screening for people with diabetes in Ontario, Canada. *CMAJ* 2013;185; E167-173.
- Kozyrskyj AL, Mustard CA, Cheang MS, Simons FE. Income-Based Drug Benefit Policy: Impact on Receipt of Inhaled Corticosteroid Prescriptions by Manitoba Children with Asthma. *Canadian Medical Association Journal* 2001;165; 897-902.
- Kratzer J, Cheng L, Allin S, Law MR. The Impact of Private Insurance Coverage on Prescription Drug Use in Ontario, Canada. *Health Policy* 2015;10; 62-74.
- Kwan J, Razzaq A, Leiter LA, Lillie D, Hux JE. Low socioeconomic status and absence of supplemental health insurance as barriers to diabetes care access and utilization. *Canadian Journal of Diabetes* 2008;32; 174-181.
- Lee JL, Maciejewski M, Raju S, Shrank WH, Choudhry NK. Value-Based Insurance Design: Quality Improvement But No Cost Savings. *Health Affairs* 2013;32; 1251-1257.
- Levy H, Meltzer D. The Impact of Health Insurance on Health. *Annual Review of Public Health* 2008;29; 399-409.
- Lexchin J, Grootendorst P. Effects of Prescription Drug User Fees on Drug and Health Services Use and On Health Status in Vulnerable Populations: a Systematic Review of the Evidence. *International Journal of Health Services* 2004;34; 101-122.
- Li X, Guh D, Lacaille D, Esdaile J, Anis AH. The impact of cost sharing of prescription drug expenditures on health care utilization by the elderly: Own- and cross-price elasticities. *Health Policy* 2007;82; 340-347.
- Limpa-Amara S, Merrill A, Rosenbach M. SCHIP at 10: A Synthesis of the Evidence on Substitution of SCHIP for Other Coverage. Final report. Mathematica Policy Research.; Princeton; 2007.
- Liu S, Chollet D. Price and Income Elasticity of the Demand for Health Insurance and Health Care Services: A Critical Review of the Literature. Final report. Mathematica Policy Research: Washington, DC; 2006.
- Locker D, Maggrias J, Quinonez C. Income, dental insurance coverage, and financial barriers to dental care among Canadian adults. *J Public Health Dent* 2011;71; 327-334.

Lohr KN, Brook RH, Kamberg CJ, Goldberg GA, Leibowitz A, Keesey J, Reboussin D, Newhouse JP. Use of medical care in the Rand Health Insurance Experiment. Diagnosis- and service-specific analyses in a randomized controlled trial. *Med Care* 1986;24; S1-87.

Look KA. Value-based insurance design and medication adherence: opportunities and challenges. *Am J Manag Care* 2015;21; e78-90.

Lopez Nicolas A, Vera-Hernandez M. Are tax subsidies for private medical insurance self-financing? Evidence from a microsimulation model. *J Health Econ* 2008;27; 1285-1298.

Lu M, Savage E. Do financial incentives for supplementary private health insurance reduce pressure on the public system? Evidence from Australia. *CHERE Working Paper 2006/11*. Centre for Health Economics Research and Evaluation (CHERE), University of Technology: Sydney; 2006.

Luiza VL, Chaves LA, Silva RM, Emmerick ICM, Chaves GC, Fonseca de Araujo SC, Moraes EL, Oxman AD. Pharmaceutical policies: effects of cap and co-payment on rational use of medicines. *Cochrane Database Syst Rev* 2015;5; CD007017.

Lurie N, Kamberg CJ, Brook RH, Keeler EB, Newhouse JP. How free care improved vision in the health insurance experiment. *Am J Public Health* 1989;79; 640-642.

Mann BS, Barnieh L, Tang K, Campbell DJT, Clement F, Hemmelgarn B, Tonelli M, Lorenzetti D, Manns BJ. Association between drug insurance cost sharing strategies and outcomes in patients with chronic diseases: a systematic review. *PLoS One* 2014;9; e89168.

Manning WG, Bailit HL, Benjamin B, Newhouse JP. *The Demand for Dental Care: Evidence from a Randomized Trial in Health Insurance*. RAND Corporation: Santa Monica, CA; 1986.

Manning WG, Newhouse JP, Duan N, Keeler EB, Leibowitz A. Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment. *The American Economic Review* 1987;77; 251-277.

Marchildon GP. *Canada: Health System Review*. WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies: Copenhagen; 2013.

Marquis MS, Long SH. Public Insurance Expansions and Crowd Out of Private Coverage. *Medical Care* 2003;41; 344-356.

Marquis MS, Phelps CE. Price Elasticity and Adverse Selection in the Demand for Supplementary Health-Insurance. *Econ Inq* 1987;25; 299-313.

Millar WJ, Locker D. Dental insurance and use of dental services. *Health Rep* 1999;11; 55-75.

Mossialos E, Thomson S. Voluntary health insurance in the European Union. *Funding health care: options for Europe* 2004; 128.

Mulvale G, Hurley J. Insurance coverage and the treatment of mental illness: Effect on medication and provider use. *Journal of Mental Health Policy and Economics* 2008;11; 177-199.

Nyman JA. American health policy: cracks in the foundation. *J Health Polit Policy Law* 2007;32; 759-783.

OECD. *OECD Health Statistics 2015. Definitions, Sources and Methods*. Organization for Economic Cooperation and Development: Paris; 2015.

Ogbechie OA, Hsu J. Systematic review of benefit designs with differential cost sharing for prescription drugs. *Am J Manag Care* 2015;21; e338-348.

Ontario Ministry of Finance. *2014 Ontario Economic Outlook and Fiscal Review. Transparency in Taxation, 2014*. Ontario Ministry of Finance: Toronto, Ontario; 2014.

Page RL, Barton P, Nair K. Effect of cost-sharing for prescription medications on health outcomes in older adults: a critical review of the literature and potential implications for managed care. *Consult Pharm* 2008;23; 44-54.

Palangkaraya A, Yong J, Webster E, Dawkins P. The income distributive implications of recent private health insurance policy reforms in Australia. *Eur J Health Econ* 2009;10; 135-148.

Payne AA. Does government funding change behavior? an empirical analysis of crowd out. In: Brown JR, Poterba JM (Eds), *Tax Policy and the Economy, Volume 23*. University of Chicago Press; 2009. p. 159-184.

Pendzialek JB, Simic D, Stock S. Differences in price elasticities of demand for health insurance: a systematic review. *Eur J Health Econ* 2016;17; 5-21.

Polinski JM, Donohue JM, Kilabuk E, Shrank WH. Medicare Part D's effect on the under- and overuse of medications: a systematic review. *J Am Geriatr Soc* 2011;59; 1922-1933.

Polinski JM, Kilabuk E, Schneeweiss S, Brennan T, Shrank WH. Changes in drug use and out-of-pocket costs associated with Medicare Part D implementation: a systematic review. *J Am Geriatr Soc* 2010;58; 1764-1779.

Quinonez C, Figueiredo R. Sorry doctor, I can't afford the root canal, I have a job: Canadian dental care policy and the working poor. *Can J Public Health* 2010;101; 481-485.

Ramraj C, Sadeghi L, Lawrence HP, Dempster L, Quinonez C. Is accessing dental care becoming more difficult? Evidence from Canada's middle-income population. *PLoS One* 2013;8; e57377.

Regopoulos LE, Trude S. Employers shift rising health care costs to workers: no long-term solution in sight. Issue brief (Center for Studying Health System Change) 2004; 1-4.

Remler DK, Greene J. Cost-sharing: a blunt instrument. *Annu Rev Public Health* 2009;30; 293-311.

Rice T, Matsuoka KY. The impact of cost-sharing on appropriate utilization and health status: a review of the literature on seniors. *Med Care Res Rev* 2004;61; 415-452.

Roach S. *The Impact of Prescription Drug Insurance on Healthcare Utilization*. University of Ottawa: Ottawa; 2014.

Rodriguez M, Stoyanova A. Changes in the demand for private medical insurance following a shift in tax incentives. *Health Econ* 2008;17; 185-202.

Sarma S, Basu K, Gupta A. The influence of prescription drug insurance on psychotropic and non-psychotropic drug utilization in Canada. *Social science and medicine* 2007;65; 2553-2565.

Shore-Sheppard L, Buchmueller TC, Jensen GA. Medicaid and crowding out of private insurance: a re-examination using firm level data. *Journal of Health Economics* 2000;19; 61-91.

Sinnott S-J, Buckley C, O'Riordan D, Bradley C, Whelton H. The effect of copayments for prescriptions on adherence to prescription medicines in publicly insured populations; a systematic review and meta-analysis. *PLoS One* 2013;8; e64914.

Sipe TA, Finnie RKC, Knopf JA, Qu S, Reynolds JA, Thota AB, Hahn RA, Goetzel RZ, Hennessy KD, McKnight-Eily LR, Chapman DP, Anderson CW, Azrin S, Abraido-Lanza AF, Golenberg AJ, Vernon-Smile ME, Nease DE, Jr. Effects of Mental Health Benefits Legislation. *American Journal of Preventive Medicine* 2015;48; 755-766.

Skinner EH, Foster M, Mitchell G, Haynes M, O'Flaherty M, Haines TP. Effect of health insurance on the utilisation of allied health services by people with chronic disease: a systematic review and meta-analysis. *Aust J Prim Health* 2014;20; 9-19.

Smart M, Stabile M. Tax credits, insurance, and the use of medical care. *Canadian Journal of Economics* 2005;38; 345-365.

Stabile M. Private insurance subsidies and public health care markets: evidence from Canada. *Canadian Journal of Economics* 2001;34; 921-942.

Stabile M. The Role of Tax Subsidies in the Market for Health Insurance. *International Tax and Public Finance* 2002;9; 33-50.

- Stabile M, Thomson S. The Changing Role of Government in Financing Health Care: An International Perspective. *Journal of Economic Literature* 2014;52; 480-518.
- Tamblyn R, Laprise R, Hanley JA, Abrahamowicz M, Scott S, Mayo N, Hurley J, Grad R, Latimer E, Perreault R, McLeod P, Huang A, Larochelle P, Mallet L. Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *JAMA* 2001;285; 421-429.
- Tang KL, Barnieh L, Mann B, Clement F, Campbell DJT, Hemmelgarn BR, Tonelli M, Lorenzetti D, Manns BJ. A systematic review of value-based insurance design in chronic diseases. *Am J Manag Care* 2014;20; e229-241.
- Thomson S, Mossialos E. Private health insurance in the European Union. European Commission: Brussels, Belgium; 2009.
- Thomson S, Schang L, Chernew ME. Value-based cost sharing in the United States and elsewhere can increase patients' use of high-value goods and services. *Health Aff (Millwood)* 2013;32; 704-712.
- Wang C, Li Q, Sweetman A, Hurley J. Mandatory Universal Drug Plan, Access to Health Care and Health: Evidence from Canada. *Journal of Health Economics* 2015;44; 80-96.
- Wang PS, Patrick AR, Dormuth C, Maclure M, Avorn J, Canning CF, Schneeweiss S. Impact of drug cost sharing on service use and adverse clinical outcomes in elderly receiving antidepressants. *J Ment Health Policy Econ* 2010;13; 37-44.
- Wang PS, Patrick AR, Dormuth CR, Avorn J, Maclure M, Canning CF, Schneeweiss S. The impact of cost sharing on antidepressant use among older adults in British Columbia. *Psychiatr Serv* 2008;59; 377-383.
- Zhang X, Andersen R, Saaddine JB, Beckles GLA, Duenas MR, Lee PP. Measuring access to eye care: a public health perspective. *Ophthalmic Epidemiol* 2008;15; 418-425.