

GENERIC DRUG PRICING AND SUBSTITUTION IN PRIVATE DRUG PLANS IN CANADA

by

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Abstract

Purpose: To estimate the willingness and ability of private plans to manage costs during the generic drug procurement reform era that began in 2006 in Canada. Two cost management aspects were assessed; the prices paid for generic drugs and the extent to which private plans have enacted measures to increase generic substitution.

Methods: IMS-Brogan Pharmastat data was used to estimate the price of commonly prescribed generic drugs and generic share of prescriptions, by plan type, province and quarter from 2003 to 2012.

Results: Prices did not decline unless the provincial governments mandated the reductions. Savings from this mandate was approximately \$264 million in Ontario. Rates of generic substitution were unaffected by the price reductions, possibly because the rates were high beforehand.

Conclusion: Private plans did not independently obtain lower generic prices. Due to already high substitution rates, there may have been limited potential for additional savings from mandatory substitution controls.

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List of Acronyms and Abbreviations

ACE	Angiotensin-Converting Enzyme
ASO	Administrative Services Only
BAP	Best Available Price
CIHI	Canadian Institute for Health Information
CLHIA	Canadian Life and Health Insurance Association
CNS	Central Nervous System
MFN	Most Favoured Nations
NTI	Narrow Therapeutic Index
ODB	Ontario Drug Benefit
OLS	Ordinary Least Squares
PA	Professional Allowance
PEI	Prince Edward Island
PPI	Proton Pump Inhibitors
RAMQ	Régie de l'Assurance Maladie
SSRI	Selective Serotonin Reuptake Inhibitors
TDSPA	Transparent Drug System for Patients Act

OVERVIEW

In Canada, a large share of prescription drug costs is covered by private sources. Whereas the privately financed share of hospital costs and physician costs are 9.1% and 1.1%, respectively, private drug plans and households finance over one half (54.5%) of prescription drug costs.¹ Approximately 22 million Canadians have private drug plan coverage; total plan spending is approximately \$9.8 billion.² Most private drug coverage is provided as an in-kind employment-related benefit. Public plans, by contrast, mainly cover seniors, those on social assistance and others with high drug costs relative to income.³

Private drug plans tend to have more generous drug reimbursement than the public plans. They tend to cover more drugs, and pay more for them.⁴ Also, unlike the public plans, most private plans do not impose so-called generic substitution policies; in other words, they do not limit reimbursement to the lowest cost interchangeable (i.e. generic) drug.⁵

¹ Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012* (Ottawa, ON: CIHI, 2012), https://secure.cihi.ca/free_products/NHEXTrendsReport2012EN.pdf; Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012* (Ottawa, ON: CIHI, 2013), https://secure.cihi.ca/free_products/Drug_Expenditure_2013_EN.pdf.

² Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012*; Canadian Life and Health Insurance, “Health Insurance Benefits in Canada Survey” (CLHIA, 2011).

³ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward* (Ottawa, ON: Government of Canada, 2008), [http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/GenDrugStudy-Report-081125-fin-e.pdf/\\$FILE/GenDrugStudy-Report-081125-fin-e.pdf](http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/GenDrugStudy-Report-081125-fin-e.pdf/$FILE/GenDrugStudy-Report-081125-fin-e.pdf); G. Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario* (Ontario Citizens’ Council, 2012), http://www.health.gov.on.ca/en/public/programs/drugs/councils/report/report_private_drug_insurance_ontario.pdf; C. Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?* (Toronto: Health Council of Canada, 2010), http://www.secorgroup.com/files/pdf/ARTICLES/generics_June182010_rpt.pdf.

⁴ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; M. Gagnon and G. Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians* (Ottawa, ON: Canadian Centre for Policy, 2010), <http://pharmacarenow.ca/wp-content/uploads/2010/09/Universal-Pharmacare-Report-e.pdf>.

⁵ F. J. Poirier and D. West, “Mercer 2011 Drug Plan Survey: Findings and Insights for Plan Sponsors,” last modified 2011, accessed September 1, 2013, http://www.mercer.com/attachment.dyn?idContent=1432300&filePath=/attachments/English/111207_WB_Mercer_Annual_Drug_survey_results_2011.pdf; D. Balaban et al., “Private Expenditures on Brand Name Prescription Drugs After Generic Entry,” *Applied Health Economics and Health Policy* 11, no. 5 (2013): 523–529.

Things are now changing. As a result of a combination of rising prescription drug use, a weak economy, and other factors, private drug plans are under some financial pressure, and are seeking ways to contain costs. As a result, private plan sponsors have introduced “cost-shifting” policies. These policies require plan beneficiaries to assume more of the drug cost.⁶ It is unclear if these policies represent a shift towards more active management of drug plan costs.

In this paper, we provide further evidence on the willingness and ability of private drug plans to manage costs. In particular, we focus on the prices that the private plans pay for generic drugs. The context is the era of reform to generic drug procurement by the public plans, which began in late 2006. Prior to 2006, the public plans reimbursed pharmacies for generic drugs at an average rate of 63% of the price of the interchangeable brand drug.⁷ Since 2006, these reimbursement rates have declined to as low as 18% of the brand drug price.⁸ This raises the question as to the extent to which private plans have been able to obtain the same deal. We address this question by examining prices paid for commonly prescribed generic drugs, by plan type (public vs. private), province and quarter over the period 2003 to 2012. More specifically, we assess whether private plans have been able to negotiate drug prices comparable to those obtained by the provincial government drug plans operating in the different provinces. In cases where private plan reimbursement declined, we also assess whether the private plans enacted measures to increase the rate of generic drug substitution, so as to capitalize on the potential savings.

We are not the first to address this issue. The previous studies, however, have examined generic reimbursement prices only partway through the reform period, and examined the prices of the top 10 selling generic drugs.⁹ We examine more drugs, as well as the top selling generic drugs,

⁶ J. Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans,” *Healthcare Policy* 9, no. 1 (2013): 35.

⁷ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁸ Canadian Pharmacists Association, “Generic Drug Pricing - Provincial Policies,” last modified 2013, accessed July 10, 2013, http://blueprintforpharmacy.ca/docs/resource-items/generic-drug-pricing---provincial-pricing_cpha_feb2013.pdf; Patented Medicine Prices Review Board, “Analytical Snapshot: International Generic Price Comparison, Early 2011,” last modified September 2013, accessed November 1, 2013, <http://www.pmprb-cepmb.gc.ca/english/view.asp?x=1771&mid=1695>.

⁹ A. Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta* (Calgary: The School of Policy Studies, University of Calgary, 2009), <http://www.policyschool.ucalgary.ca/sites/default/files/research/hollis-online-feb-09.pdf>; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

and focus on a longer period of time. No other studies have examined the impact of the reforms on rates of generic substitution in the private plans. One study looked at the impact of price on generic substitution rates in the public plans only, using data from 1981 to 1988.¹⁰ Another study compared generic drug to brand drug sales as part of the analysis conducted to quantify private plan expenditure on brand name drugs after generic entry. In that study, only three drug classes were investigated, sales rates were examined until the year 2009, and results were specific to the province of Ontario.¹¹

To preview results, we do not find that the private plans were successful in obtaining low generic prices on their own. Generic reimbursement prices did decline in several provinces, but only after the provincial government stepped in and mandated that pharmacies reduce prices charged to private plans. We estimate that in Ontario savings to the private plans from this government mandate was approximately \$268 million over the period 2010Q3 to 2012Q4.

The rate of generic drug substitution was unaffected by the price reductions. This may be because the rate of generic substitution was high before prices were reduced. Indeed, generic fill rates in the private drug plans were comparable to those in the public drug plans for the entire study period. Thus, there may have been limited potential for additional savings from mandatory substitution controls.

The structure of this paper is as follows. Chapter 1 – Introduction, provides a background on the structure of prescription drug coverage in Canada, with a focus on the differences between public and private plans. Public and private plan policies with respect to generic drug pricing, substitution, and rebate payment are also presented. Certain key literature references are examined, highlighting the contribution of this study to the existing literature in this field. The key objective of this study and the main research questions are also presented in this chapter. Chapter 2 – Methods, describes the data and presents the analysis design used to achieve the study objectives. Chapter 3 – Results, reports the private plan generic drug pricing and substitution results. Chapter 4 – Discussion, puts forward the main findings and their potential

¹⁰ A. Anis, “Substitution Laws, Insurance Coverage and Generic Drug Use,” *Medical Care* 32, no. 3 (1994): 240–256.

¹¹ Balaban et al., “Private Expenditures on Brand Name Prescription Drugs After Generic Entry.”

implications. Chapter 5 – Conclusion, presents a summary of the research significance and key findings of the study as well as several recommendations for future research.

Chapter 1 INTRODUCTION

The purpose of this chapter is to provide some background on as well as compare public and private prescription drug coverage in Canada, and the manner in which they reimburse generic drugs.

1 Framework of Prescription Drug Insurance in Canada

1.1 Background

1.1.1 Prescription Drug Coverage in Canada

In Canada, the provision of health care is a provincial government, not federal, responsibility. The federal government does, however, exert influence over provincial policies in respect of the finance of certain types of health care. In particular, the *Canada Health Act* makes federal transfers to the provinces contingent on the provinces providing publicly-financed universal coverage of “medically necessary” physician services and hospital-based care. Because prescription drugs provided by community pharmacies fall outside of the *Canada Health Act*, provinces have less financial incentive to provide drug coverage with the same degree of comprehensiveness as is provided for physician and hospital services.¹² As a result, provincial government drug coverage is not provided free of charge to all citizens, as is the case for physician and hospital services. Instead, coverage is extended to specific groups, mainly seniors, social assistance recipients, and others with high drug costs relative to income. Most beneficiaries are required to pay a proportion of the drug cost. The federal government provides coverage to aboriginals, active and retired military personnel and various other groups. Again, most beneficiaries are required to pay for a part of the drug cost.¹³

¹² C. Blanchette, “Provincial and Private Drug Insurance Plans in Canada,” last modified 1996, accessed September 4, 2013, <http://publications.gc.ca/Collection-R/LoPBdP/MR/mr142-e.htm>; Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario*.

¹³ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; K. Phillips, “Catastrophic Drug Coverage in Canada,” last modified 2009, accessed September 20, 2013, <http://www.parl.gc.ca/content/lop/researchpublications/prb0906-e.htm>; Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario*.

Given the gap in public coverage, the majority of non-indigent, non-elderly Canadians rely on private drug insurance coverage. Most private drug coverage is provided in the form of an employment-related in-kind benefit.¹⁴ Private coverage is also available for purchase by individuals, but relatively few individual insurance contracts are written. A Canadian Life and Health Insurance Association (CLHIA) survey reports that in 2011, employer-sponsored private drug plans cover 22.4 million employees and their dependents, representing about 67% of the population. There are only about 20,000 individual contracts.¹⁵

Manulife, and other large health insurance companies in Canada offer both traditional drug insurance and ‘administrative services only’ (ASO) plans. The difference between these is in the extent to which the risk is shared between the plan sponsor and the insurance company. In insured plans, the employer pays premiums for each employee or group, and the insurer assumes the cost and risk of paying drug claims. The risk is normally spread out over all of the plans in the insurer’s risk pool. In ASO plans, on the other hand, the insurer simply handles the administration of these plans – i.e., adjudicating transactions between pharmacies and plan sponsors – and the plan sponsor covers drug costs (in addition to the administration fees paid to the insurer). Thus, the plan sponsor bears all the financial risk associated with particularly high drug bills.¹⁶ In 2011, a substantial amount of employees and their dependents were covered by ASO plans. Out of the 22.4 million employer-sponsored plan beneficiaries, about 9.3 million (41%) were contracted under ASO plans.¹⁷

Although most working age Canadians do not rely on public drug plan coverage, they do nonetheless benefit from a large public subsidy. This consists of a tax subsidy provided to

¹⁴ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*; Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario*; Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*

¹⁵ Canadian Life and Health Insurance, “Health Insurance Benefits in Canada Survey”; Statistics Canada, “The Canadian Population in 2011: Populations Counts and Growths,” last modified 2013, accessed November 1, 2013, <http://www12.statcan.ca/myaccess.library.utoronto.ca/census-recensement/2011/as-sa/98-310-x/98-310-x2011001-eng.cfm>.

¹⁶ J. Medrzycki, “The ‘Down Low’ on Administrative Services Only Plans,” *Montridge Edge Quarterly*, no. 6 (2009), http://www.montridge.com/docs/Oct09_Montridge_Fall09_web.pdf; Competition Bureau, *Canadian Generic Drug Sector Study* (Government of Canada, 2007), <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02495.html>.

¹⁷ Canadian Life and Health Insurance, “Health Insurance Benefits in Canada Survey.”

employer-sponsored drug plans: Employees do not pay tax on the value of their employer-provided drug coverage.¹⁸ Should the value of an employee's drug coverage instead be paid as income, the employee would pay tax on this income at his or her marginal tax rate, the tax paid on the last dollar earned. For top income earners, the marginal income tax rate approaches 50%.¹⁹ Gagnon estimates that in 2008, the value of this tax subsidy nationally was \$933 million.²⁰

The net result of these insurance arrangements is that in 2010, the last year for which accurate estimates are available, public plans spent \$11.8 billion on prescription drugs; this represents 45.5% of total prescription drug costs. Private drug plan expenditure accounted for about 36% of total prescription drug costs during that same year (Figure 1). Out of pocket payments by households with no coverage or partial coverage represented the remaining 18.5% of total prescription drug costs.²¹

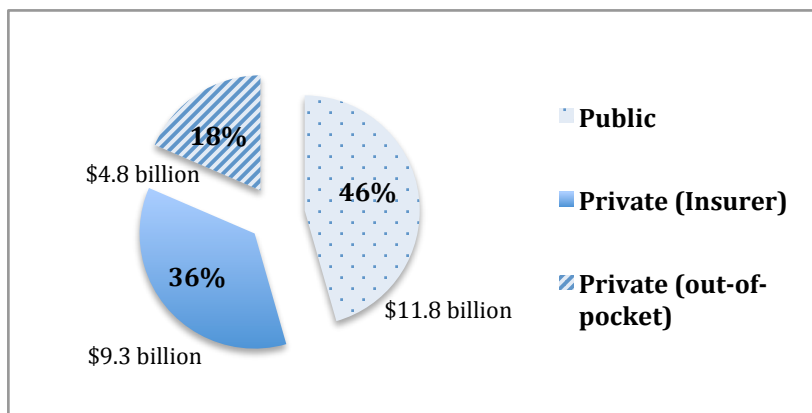


Figure 1 – Canadian Prescription Drug Expenditure by Drug Plan Type in 2010. Source: (Canadian Institute for Health Information 2013)

¹⁸ R. Evans, "Old Bones, New Data: Emmett Hall, Private Insurance and the Defeat of Pharmacare," *Healthcare Policy* 4, no. 3 (2009): 16–24; Gagnon and Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians*.

¹⁹ Canada Revenue Agency, "Canadian Income Tax Rates for Individuals - Current and Previous Years," last modified 2013, accessed August 10, 2013, <http://www.cra-arc.gc.ca/tx/ndvdl/fq/txrts-eng.html>.

²⁰ Gagnon and Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians*.

²¹ Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012*.

1.1.2 Drug Plan Management

As noted earlier, the public and private drug plans exert different degrees of control over program spending. Public plans limit coverage to those drugs that offer sufficient value for money;²² public plans have conducted economic appraisals of new drugs since the early 1990s. Private plans, by contrast, tend not to use evidence on value for money in making coverage decisions and tend to cover a larger array of drugs.²³ Indeed, according to a 2011 Mercer survey, almost 60% of the employer-sponsored drug plans had an open formulary, meaning that they covered all prescription drugs, and two-thirds of plans even covered over-the-counter drugs. Furthermore, 86% of the plans did not have a yearly maximum on individual drug costs.²⁴

There are more differences between the public and private plans. Public plans will often negotiate confidential discounts off of the list prices of branded drugs; private plans normally pay the list price.²⁵ Public plans limit the professional (i.e. dispensing) fee paid to pharmacies for each prescription dispensed and moreover prohibit pharmacies from extra-billing their public plan beneficiaries. Professional fees charged to private plan beneficiaries (and the uninsured) tend to be higher than the fees paid by the public plan. Public drug plans limit reimbursement of interchangeable brand and generic drugs to the lowest priced drug, which is typically a generic drug.²⁶ Many private plans do not impose this restriction. According to the 2011 Mercer survey,

²² Canadian Agency for Drugs and Technologies in Health, *Guidelines for the Economic Evaluation of Health Technologies: Canada* (CADTH, 2006), accessed October 5, 2013, http://www.cadth.ca/media/pdf/186_EconomicGuidelines_e.pdf; Wyatt Health Management, *The Rx&D International Report on Access to Medicines* (Canada's Research-Based Pharmaceutical Companies, 2012), <http://www.wyatthealth.com/wp-content/uploads/IRAM/iram-2011-2012-English.pdf>.

²³ Applied Management, *Canadians' Access to Insurance for Prescription Medicines* (Toronto: Applied Management in association with Fraser Group and Tristat Resources, 2000), http://www.frasergroup.com/downloads/volume_1.pdf; H. Stevenson, *An End to Blank Cheques: Getting More Value Out of Employer Drug Plans (white Paper)* (Reformulary Group, 2011), accessed August 5, 2013, http://www.reformulary.com/files_docs/content/pdf/en/An_End_to_Blank_Cheques-May_2011_ENr.pdf.

²⁴ B. Martinez, "Mercer 2011 Annual Drug Survey Results", 2011, accessed August 1, 2013, <http://www.benefitscanada.com/wp-content/uploads/2011/12/Barbara-Martinez-Mercer-Survey.pdf>.

²⁵ S. G. Morgan et al., "Use of Product Listing Agreements by Canadian Provincial Drug Benefit Plans," *Healthcare Policy* 8, no. 4 (2013): 45–55.

²⁶ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

only 50% of the private drug plans surveyed mandated lowest-cost generic substitution, and 80% liberally reimbursed the brand name drug if the physician requested “no substitution”.²⁷

Public Drug Plans	Private Drug Plans
Coverage	Coverage
Seniors (65+), low income, high drug costs relative to income	Employment-related benefit
Reimbursement	Reimbursement
Reimburse fewer drugs Pay less for each drug	Reimburse more drugs Pay more for each drug
Generic Substitution	Generic Substitution
Limit reimbursement of interchangeable drugs to the price of the lowest cost generic alternative. Allow the reimbursement of the brand name drug only when medically necessary, forms required.	Usually do not require the lower cost generic alternative be used when available. Reimburse the brand name drug if the physician specified ‘no substitution’ on the prescription.

Table 1 - Public and Private Drug Plans: Difference in Coverage, Reimbursement, and Generic Substitution Policies

The focus of this thesis is on the difference between the public and private drug plan procurement of generic drugs. Spending on generic drugs nationally was \$5.4 billion in 2012, representing 24.4% of prescribed drug spending.²⁸ Clearly, reductions in generic reimbursement prices will have important effects on drug plan spending. As was mentioned, prior to 2006, the public drug plans reimbursed pharmacies for generic drugs dispensed to public plan beneficiaries at a rate equal to 63% of the price of the interchangeable branded drug.²⁹ Since 2006, the public plans have reduced this percentage by varying amounts. The reimbursement rates now range from 35% to 18%.³⁰ Reductions in generic reimbursement rates were highly controversial

²⁷ Martinez, “Mercer 2011 Annual Drug Survey Results.”

²⁸ Canadian Generic Pharmaceutical Association, “Ontario’s Prescription Drug Expenditures 2012,” last modified 2013, accessed September 10, 2013, http://www.canadiangenerics.ca/en/advocacy/drug_expenditures.asp.

²⁹ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

³⁰ Ontario Public Drug Programs Division, “Notice from the Executive Officer: Pan-Canadian Competitive Value Price Initiative for Generic Drugs,” last modified 2013, accessed October 30, 2013, http://www.health.gov.on.ca/en/pro/programs/drugs/opdp_eo/notices/eo_pancanadian_generic_pricing_20130304.pdf; Canadian Pharmacists Association, “Generic Drug Pricing - Provincial Policies.”

because these reductions reduced pharmacy earnings, and pharmacy associations protested.³¹ For many years, pharmacies were able to “buy low and sell high”: they could purchase generic drugs for less than the amount that they were reimbursed by the drug plan, and keep the difference. They were able to purchase generic drugs at relatively low prices because there was competition among different generic manufacturers for pharmacy business. Generic drug manufacturers competed by lowering the price they charged pharmacies for their products. Pharmacy earnings from this source were substantial, at least prior to the procurement reforms of 2006. In 2005, pharmacy net revenue on the sale of generic drugs totaled approximately \$2 billion in Canada. The reductions in public plan generic drug reimbursement have dramatically reduced these earnings.³²

Previewing our empirical results, we note that most private plans were unable to obtain the public plan prices. This finding appears to be consistent with the consensus view of the literature that private drug plans in Canada are not particularly successful at cost management, or at least not as successful as the public drug plans.³³ Several reasons have been advanced for the divergence in the degree of cost management between the public and private drug plans. One reason is that because the public plans are larger than the private plans, they are better able to extract price discounts.³⁴ In a single province, the provincial government drug plan spends much more than any of the numerous individual private drug plans. While this certainly is the case, individual drug plans are administered by one of several large drug plan claims adjudicators, which include ESI, Manulife, Great West Life, among others. Each one of these adjudicators still manages a substantial number of member plans, and therefore presumably could still leverage

³¹ Canadian Pharmacists Association, “Generic Pricing Decision Short-Changes Patient Care,” last modified 2013, accessed August 3, 2013, <http://www.pharmacists.ca/index.cfm/news-events/news/generic-pricing-decision-short-changes-patient-care/>; K. Lynas, “Private Insurers Implementing Policies Making Generic Substitution Mandatory,” *Canadian Pharmacists Journal* 145, no. 6 (2012): 245.

³² P. Grootendorst, M. Rocchi, and H. Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada* (Ottawa: Competition Bureau, 2008), http://individual.utoronto.ca/grootendorst/pdf/Grootendorst_et_al_Pharmacy_Rebates_Report_Final.pdf.

³³ Evans, “Old Bones, New Data: Emmett Hall, Private Insurance and the Defeat of Pharmacare”; Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans”; Gagnon and Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians*.

³⁴ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

enough purchasing power to negotiate discounts. It is unclear to what extent the adjudicators are performing this role. We searched both the academic literature and business news media and found only one instance where an adjudicator attempted to obtain lower generic drug prices. This was an attempt made by an adjudicator, Medavie Blue Cross, to initiate a tender for a multi-sourced antibiotic, clarithromycin. Under the scheme, the lowest price bid would have been given exclusive rights to supply the member drug plans. Abbott Laboratories was awarded the tender but had to withdraw its offer due to the strong opposition generated by retail pharmacies.³⁵

Another reason advanced for the lack of cost control in private drug plans revolves around the value that employees attach to generous benefits. Several studies suggest that employers believe that reducing benefits would make it difficult to attract and retain employees, especially when labour markets are tight and there is competition for employees. Thus generous drug benefits appear to be a desirable non-pecuniary benefit among employees and potential recruits.³⁶ By the same token, reductions in drug plan generosity could entail potentially lengthy and costly negotiations with employees and possibly with their unions as well.³⁷ Indeed, 45% of the plan sponsors surveyed by Mercer in 2011 indicated that they did not intend to introduce any cost-cutting strategies to their plan design within the next 3 years. One of the reasons cited was the avoidance of the high costs associated with negotiating drug plan redesign.³⁸ Thus it could be the case that the negotiating costs outweigh the potential savings that could be generated from a change in plan design.

The preceding discussion also explains the apparent lack of success that the private drug plan claims adjudicators have had in obtaining the same generic drug prices as those paid by the public plans. The primary bargaining chip that an adjudicator would have over a pharmacy or

³⁵ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*; Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012*.

³⁶ Telus Health, "Emergence of Private Payer Groups," *Insights* (2012), accessed September 9, 2013, <http://www.telushealth.com/docs/electronic-medical-records/emergence-of-private-payer-groups.pdf?sfvrsn=0>; Stevenson, *An End to Blank Cheques: Getting More Value Out of Employer Drug Plans (white Paper)*; Kratzer et al., "Cost-Control Mechanisms in Canadian Private Drug Plans."

³⁷ Kratzer et al., "Cost-Control Mechanisms in Canadian Private Drug Plans."

³⁸ Poirier and West, "Mercer 2011 Drug Plan Survey: Findings and Insights for Plan Sponsors."

pharmacy chain is the power to not pay for prescription drug costs incurred by the beneficiaries of the member drug plans, i.e., the threat to take their business elsewhere. The pharmacy would then have a choice of retaining these customers, albeit at a lower price, or forgoing these customers. For the private drug plan to make good on its threat, however, it would need to have some buy-in from employees. But it is unclear if employees would accept restrictions on their choice of pharmacies.

Another reason that employers appear to be reluctant to redesign their drug plans is that average employee drug costs are not that high, at least when expressed as a share of total employee compensation. Using Canadian Institute for Health Information (CIHI) data for 2012, province-specific private plan drug spending (divided by the size of the population under 65) ranged from \$406 to \$772 per person.³⁹ Salaries vary by industry, but they are in the order of \$40,000-\$60,000 per annum.⁴⁰ Therefore, relative to overall compensation, the average drug insurance cost per employee may not seem to be large enough to motivate employers to incur the costs of modifying benefits.⁴¹

Analysts have also advanced reasons why many private drug plans have open formularies. The reason stems from the belief that a ‘better’ drug plan that covers more and expensive drugs is believed to translate to a healthier labor force which takes fewer sick days.⁴² Generic drugs are sometimes believed to be not as effective as the original brand name drugs. This is particularly the case with critical dose drugs, where reports have been made over a heightened risk of adverse drug reactions resulting from switching to generic drugs.⁴³ As a result, this might have led to the belief that a better drug plan should allow open access to brand name drugs.

³⁹ Statistics Canada, “CANSIM Database,” last modified 2012, accessed October 25, 2013, <http://www5.statcan.gc.ca/cansim/a34?lang=eng&mode=tableSummary&id=0510001&pattern=population&stByVal=1&&p1=1&p2=-1>.

⁴⁰ Statistics Canada, “CANSIM Table(s): Earnings, Average Weekly, by Industry, Monthly (Canada),” last modified 2013, accessed October 25, 2013, <http://www.statcan.gc.ca/myaccess.library.utoronto.ca/tables-tableaux/sum-som/101/cst01/labor93a-eng.htm>.

⁴¹ Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

⁴² Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario*.

⁴³ M. Hassali et al., “Physicians’ Views on Generic Medicines: A Narrative Review,” *Journal of Generic Medicines* 7, no. 1 (2010): 30–39.

On the other side of the spectrum, companies that provide drug plan claims adjudication may have little incentive to control costs for ASO plans. This is because insurance company income, which is in the form of administrative charges, is proportional to the ASO plan's total drug cost.⁴⁴ On average, private insurance companies charge 13.2% for administrative services. As a result, it is in their financial interest that costs continue to grow. That, combined with the lack of demand from employers to find plans that will help manage costs, has resulted in there being little incentive for insurance companies to supply advanced cost-managing packages. Thus claims adjudication companies would presumably compete for clients by offering low administrative charges, instead of offering plans with sophisticated cost-saving features.⁴⁵

We next turn to our empirical analysis of the difference between prices paid for generic drugs by the public and private drug plans and the rate of generic substitution. In order to do that, we briefly review the policies and regulations surrounding the reimbursement of generic drugs by the provincial plans that are the focus of this thesis. It should be noted that the total cost of a generic drug prescription consists of the generic drug price (ingredient cost), pharmacy markup, and dispensing fee.⁴⁶ All of the below-mentioned price policies applied to the generic drug price component.

1.2 History

1.2.1 Provincial Policies

Provincial governments have for many years regulated the reimbursement of generic drugs. Regulations include limits on the prices that they are willing to pay for generics as well as restrictions on the reimbursement of interchangeable drugs to the lowest-cost alternative, thereby strongly encouraging and in some cases mandating generic substitution. Until recently, these regulations were applied to the provincial government public drug plans only.⁴⁷ Starting in 2009,

⁴⁴ Gagnon and Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians*.

⁴⁵ Kratzer et al., "Cost-Control Mechanisms in Canadian Private Drug Plans."

⁴⁶ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

⁴⁷ Competition Bureau, *Canadian Generic Drug Sector Study*; A. Anis, S. Harvard, and C. Marra, "Ontario's Plunging Price-Caps on Generics: Deeper Dives May Drown Some Drugs," *Open Medicine* 5, no. 3 (2011),

some provincial drug plans regulated the prices that pharmacies can charge private payers for generic drugs.⁴⁸ In the following two subsections, we present an overview of the generic drug pricing and substitution policies implemented in the provinces that are examined in this study: Alberta, British Columbia, New Brunswick, Nova Scotia, Ontario, and Québec. The regulation of pharmacy rebates/professional allowances is also reviewed in the third subsection.

1.2.1.1 Regulation of Prices of Generic Drugs Paid for by Public Drug Plans and Private Drug Plans

Before 2006, the provincial drug plans largely emulated the generic pricing restrictions of the Ontario Drug Benefit (ODB) program – the Ontario government drug plan, and largest drug plan in Canada. In order to be listed in the ODB formulary, generic drug manufacturers had to sell their drugs at a rate not in excess of some pre-set maximum. These generic drug maximum reimbursement rates have traditionally been set at a percentage of their reference brand name drug price.⁴⁹ In May 1993, the ODB limited the reimbursement prices of multiple-source generic drugs to a maximum of 75% of the reference brand name drug price for single-sourced generics, and 67.5% for multi-sourced generics (90% of the first generic drug price).⁵⁰ In other words, if there was just one generic available on the market, then the reimbursement price was 75%; otherwise it was 67.5%. From 1998 to 2006, the ODB lowered these rates to 70% for single-sourced generics and 63% for multi-sourced generics. These regulations were established to induce competition, but instead, prices charged for generic drugs in Ontario tended to cluster around these maximum rates.⁵¹ Other provinces also implicitly accepted the ODB reimbursement rates, and private plan prices tended to follow the public plan prices. Therefore

<http://www.openmedicine.ca/article/view/454/427>; Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

⁴⁸ British Columbia Ministry of Health Services, “Patients to Benefit from Lower Generic Drug Prices,” last modified 2010, accessed July 6, 2013, http://www2.news.gov.bc.ca/news_releases_2009-2013/2010HSERV0038-000802.htm; Pacific Blue Cross, “Drug Pricing - Working Together for Sustainability and Positive Health Outcomes,” last modified 2010, accessed November 10, 2013, <http://www.pac.bluecross.ca/corp/company/media/?articleid=634069063719516250>.

⁴⁹ Anis, Harvard, and Marra, “Ontario’s Plunging Price-Caps on Generics: Deeper Dives May Drown Some Drugs,” Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁵⁰ Anis, Harvard, and Marra, “Ontario’s Plunging Price-Caps on Generics: Deeper Dives May Drown Some Drugs.”

⁵¹ A. Anis, D. P. Guh, and J. Woolcott, “Lowering Generic Drug Prices: Less Regulation Equals More Competition,” *Medical Care* 41, no. 1 (2003): 135–141.

during that time period, prices of generic drugs sold to Ontario's private plans as well as to other provinces generally followed the 75/90 and 70/90 ODB rates.⁵²

In 2006, The Transparent Drug System for Patients Act (TDSPA), otherwise known as Bill 102, introduced the first major generic drug pricing policy reform in Ontario. The TDSPA reduced prices of multiple-source generic drugs to an average of 50% of the interchangeable brand name drug price.⁵³ The TDSPA also gave the Executive Officer of the ODB the power to negotiate reimbursement rates for individual generics; thus a generic firm could petition the Executive Officer for a higher reimbursement rate if, for instance, the 50% was not sufficiently high to make production profitable.⁵⁴

The policy reform targeted prices paid by Ontario's provincial plan; the regulations did not apply to the prices of generic drugs offered to private drug plans as well as to uninsured patients. According to a Competition Bureau report released in 2008, the TDSPA created a two-tiered pricing system where the prices of generic drugs sold to private payers were much higher than the prices of generic drugs sold to Ontario's public drug plan.⁵⁵

The price discounts mandated by the TDSPA prompted the other provinces to formally establish their own independent price regulations.

Quebec's prescription drug market is governed by different market forces and regulations compared to other Canadian provinces. Québec has a "Most-Favoured-Nation" (MFN) rule that requires generic drug manufacturers to sign a listing agreement to offer the province its drugs at a price that cannot be higher than the price charged in any other province in Canada, i.e., the

⁵² Anis, Harvard, and Marra, "Ontario's Plunging Price-Caps on Generics: Deeper Dives May Drown Some Drugs"; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁵³ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁵⁴ Canadian Pharmacists Association, "Canadian Pharmacists Association's Submission on the Notice of Proposed Regulations to Amend Ontario Regulation 935 under the Drug Interchangeability and Dispensing Fee Act and Ontario Regulation 201/96 under the Ontario Drug Benefit Act," last modified 2006, accessed November 10, 2013, <http://www.pharmacists.ca/cpha-ca/assets/File/cpha-on-the-issues/TDSPAProposedAmendments.pdf>; Competition Bureau, *Canadian Generic Drug Sector Study*.

⁵⁵ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

“Best Available Price” (BAP).⁵⁶ BAP laws in Quebec also ensure that the private plans get the same price discounts as the public plan.⁵⁷ Thus Quebec automatically benefitted from the lower prices charged to ODB. Quebec also reduced the reimbursement rates of generic drugs to a maximum of 60% of the equivalent brand name drug price for the first generic, and 54% for subsequent generics. This policy was made effective in February 2008. This policy would also lower the prices paid in Quebec for generic drugs that were not reimbursed by ODB.⁵⁸

Several other provinces subsequently introduced their own generic reimbursement reforms. The generic drug pricing regulations implemented in British Columbia and Alberta were unique in that the initial policy reforms in these two provinces distinguished between new and existing generic drugs.

In January 2009, the British Columbia Ministry of Health reached an agreement with the community pharmacies that resulted in the reduction of new multiple-source generic drug prices to 50% of the reference brand name drug price for all payers.⁵⁹ New generic drugs were defined as those that were listed on the formulary on or after January 1st, 2009.⁶⁰ This interim policy was renewed in July 2010, limiting reimbursement of new generics to 42% of the brand drug price. Effective October 15th 2010, the maximum reimbursement rate of existing generic drugs was

⁵⁶ C. Marcotte, “Avis Aux Fabricants de Médicaments: Hausse de Prix 2011 et Respect Du Meilleur Prix Au Canada,” last modified 2011, accessed November 1, 2013, http://www.inesss.qc.ca/fileadmin/doc/INESSS/Inscription_medicaments/Avis_fabricants/INESSS-Avis-respect-prix-20110512.pdf; Institut National d’Excellence en Sante et en Services Sociaux, “Price Policy,” last modified 2011, accessed September 3, 2013, <http://www.inesss.qc.ca/index.php?id=31&L=1>; Competition Bureau, *Canadian Generic Drug Sector Study*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁵⁷ S. G. Morgan, J. R. Daw, and M. Law, *Rethinking Pharmacare in Canada*, vol. 384 (C.D. Howe Institute, 2013), accessed November 1, 2013, http://www.cdhowe.org/pdf/Commentary_384.pdf; Association Québécoise des Pharmaciens Propriétaires, “How Is The Price of Prescription Drugs Set?,” last modified 2013, accessed November 2, 2013, <http://monpharmacien.ca/wp-content/uploads/2013/06/how-price-of-prescription-drugs-set.pdf>.

⁵⁸ Competition Bureau, *Canadian Generic Drug Sector Study*; Institut National d’Excellence en Sante et en Services Sociaux, “Price Policy.”

⁵⁹ British Columbia Ministry of Health, “Interim Agreement,” last modified 2008, accessed September 4, 2013, <http://www.health.gov.bc.ca/pharmacare/suppliers/ia.pdf>; Pacific Blue Cross, “Drug Pricing - Working Together for Sustainability and Positive Health Outcomes.”

⁶⁰ British Columbia Ministry of Health, “Interim Multiple-Source Generics Pricing Policy,” *BCPharmaCare Newsletter* 8 (2008), <http://www.health.gov.bc.ca/pharmacare/newsletter/08-012news.pdf>.

reduced to 50% of the brand drug price. New generic drug prices remained at the 42% limit.⁶¹ These reimbursement rates applied to all generic drugs, regardless of whether they were sold to public or private drug plans.⁶²

Alberta followed in October 2009, reducing the prices of new multiple-source generic drugs (those listed in the formulary after October 1st, 2009) to 45% of the brand name drug price. In April 2010, the prices of existing generic drugs were decreased to 56% of the brand name drug price. Similar to the policy in British Columbia, the reduction in reimbursement rates applied to all generic drugs listed in the province's formulary, regardless of whether they were sold to public or private drug plans.⁶³

In 2010, Ontario reduced its generic reimbursement to 25% of the reference brand name drug price. This policy was effective as of July 2010. Ontario also began to regulate the prices that were paid by private drug plans.⁶⁴ (As was mentioned earlier, up until this point, private drug plans were excluded from Ontario's generic drug pricing regulations.⁶⁵) The regulations for private payers were phased in over three stages. Prices were required to decrease to 50% in July 2010, 35% in April 2011, and finally to 25% in April 2012. For Ontario's public drug plan, prices were reduced to 25% of the brand name drug price, effective July 2010.⁶⁶

To match the price reductions in Ontario, Quebec initiated its next generic drug pricing policy reform in 2010. Maximum generic drug reimbursement rates were reduced to 37.5% of the

⁶¹ British Columbia Ministry of Health Services, *Pharmacy Services Agreement*, 2010, accessed September 5, 2013, <http://www.health.gov.bc.ca/pharmacare/suppliers/psa.pdf>.

⁶² Equitable life of Canada, "Generic Drug Pricing Summary," last modified 2011, accessed August 15, 2013, <http://www.equitable.ca/en/our-products/group-benefits/what's-new-in-group-benefits.aspx>.

⁶³ Alberta Health, "Alberta Pharmaceutical Strategy, Phase Two," last modified 2010, accessed July 14, 2013, <http://www.health.alberta.ca/documents/Pharma-Strategy-2-Generic-Drugs.pdf>; Government of Alberta, "Albertans to Benefit from Reduced Prices for Existing Generic Drugs," last modified 2010, accessed November 15, 2013, <http://alberta.ca/release.cfm?xID=277267697ccf8-c8b8-b2d6-d4419afae7d72e85>.

⁶⁴ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

⁶⁵ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

⁶⁶ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

reference brand drug price in November 2010, 30% in April 2011, and finally to 25% in April 2012.⁶⁷

The “New Multiple-Source Generics Pricing Policy” in British Columbia was finally abolished on July 4th, 2011. Manufacturers were required to list all multiple-source generic drug prices at 40% of their equivalent brand drug price.⁶⁸ In Alberta, maximum reimbursement rates of all generic drugs were reduced to 35% in July 2012.⁶⁹

Nova Scotia and New Brunswick finally introduced their own policy reforms in July 2011 and June 2012 respectively.⁷⁰ New Brunswick applied the pricing regulations to all generic drugs listed in its formulary, regardless of whether they were sold to public or private drug plans.⁷¹ In Nova Scotia, the price discounts were intended for its public drug plan only and applied to the generic drugs that were listed on the provincial formulary.⁷² However, prices decreased for all payers in Nova Scotia.⁷³ The reason behind the decline in prices paid by private plans is unclear. We do know that the CLHIA lobbied the government of Nova Scotia to lower generic prices paid by the private plans. Indeed, the CLHIA posted on line a news release dated May 8th, 2011 that

⁶⁷ Ibid.

⁶⁸ British Columbia Ministry of Health, “New Pharmacy Services Agreement,” *BC PharmaCare Newsletter* 10, no. 7 (2010), accessed August 20, 2013, <http://www.health.gov.bc.ca/pharmacare/newsletter/10-007news.pdf>.

⁶⁹ Canadian Pharmacists Association, “Generic Drug Pricing - Provincial Policies.”

⁷⁰ Canadian Institute for Health Information, *National Prescription Drug Utilization Information System Database - Plan Information: Summary of Changes*, Report (CIHI, 2013), https://secure.cihi.ca/free_products/NPDUIS_SummaryOfChanges_1307_e1.pdf; Canadian Pharmacists Association, “Generic Drug Pricing - Provincial Policies.”

⁷¹ New Brunswick Department of Health, “Generic Drug Pricing Policy Announced,” last modified 2012, accessed August 15, 2013, http://www2.gnb.ca/content/gnb/en/news/news_release.2012.03.0226.html.

⁷² Nova Scotia Department of Health and Wellness, “Fair Drug Pricing Act To Become Law On July 1,” last modified 2011, accessed October 1, 2013, <http://novascotia.ca/news/release/?id=20110630009>; Nova Scotia Department of Health and Wellness, “Fair Drug Prices for Nova Scotians - Generic Drug Pricing Examples,” accessed September 3, 2013, <http://novascotia.ca/dhw/fairdrugprices/documents/Fair-Drug-Pricing-Act-examples.pdf>.

⁷³ Great-West Life, “Nova Scotia Makes Further Cuts to Generic Drug Prices,” *GroupLine*, no. 12 (2012): 5; J. McPhee, “Generic Drug Prices Set to Drop Again in Nova Scotia,” *The Chronicle Herald*, 2012, <http://thechronicleherald.ca/novascotia/121171-generic-drug-prices-set-to-drop-again-in-nova-scotia>.

specifically petitions the government to lower generic prices for all Nova Scotians.⁷⁴ A government news release issued January 30th, 2012 announced that all Nova Scotians were indeed paying the reduced prices.⁷⁵ This strongly suggests that the government – not the CLHIA – negotiated the lower prices. The timeline below presents the dates at which the generic drug pricing policies were implemented in Canada (Figure 2).

⁷⁴ F. Swedlove, “Re: Recent Fair Drug Pricing Act Announcement,” last modified 2011, accessed November 1, 2013, http://www.clhia.ca/domino/html/clhia/clhia_lp4w_lnd_webstation.nsf/page/66351B28C949C7308525788600722B52.

⁷⁵ Nova Scotia Department of Health and Wellness, “Fair Drug Prices Now a Reality for Nova Scotians,” last modified 2012, accessed November 10, 2013, <http://novascotia.ca/news/release/?id=20120130003>.

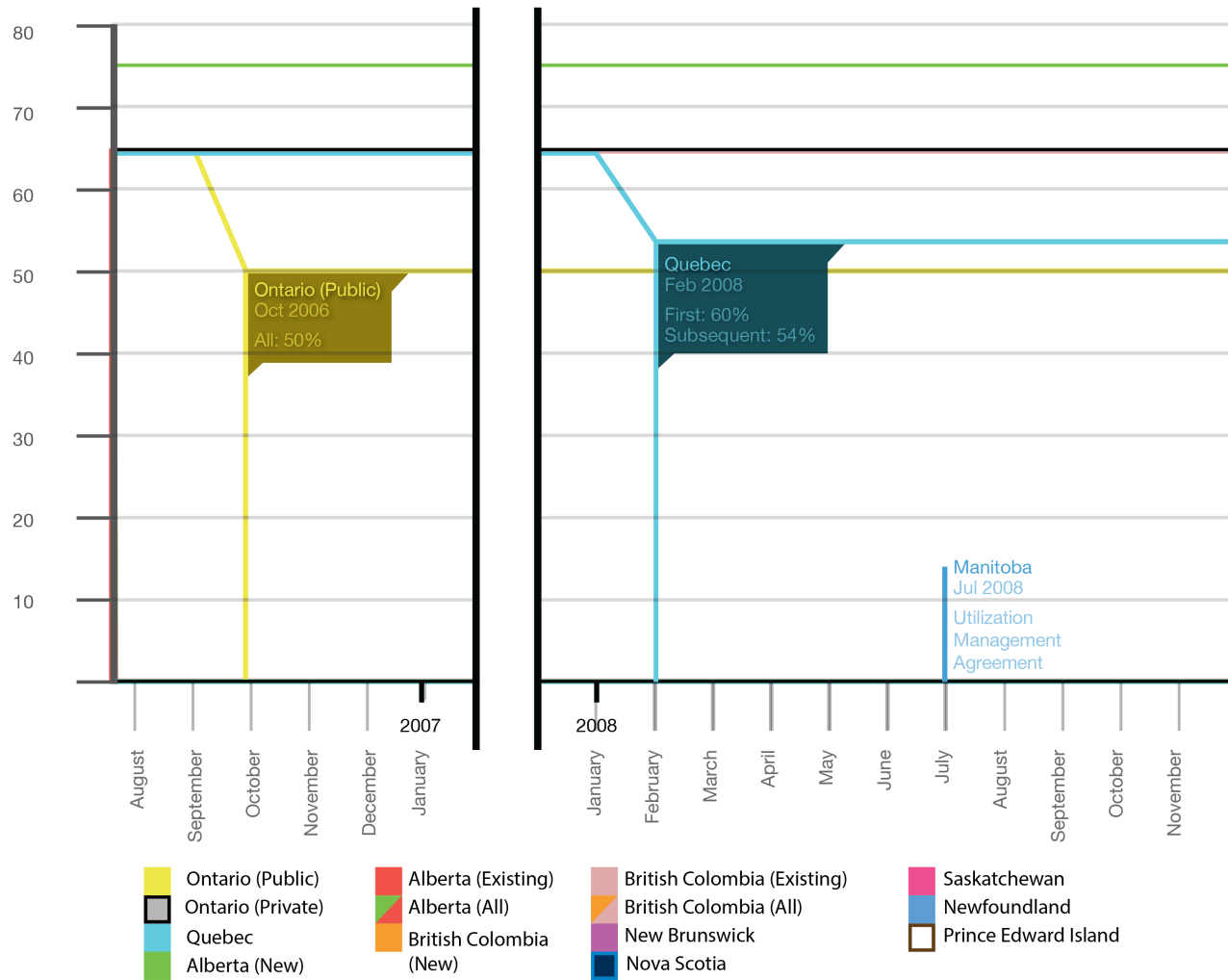
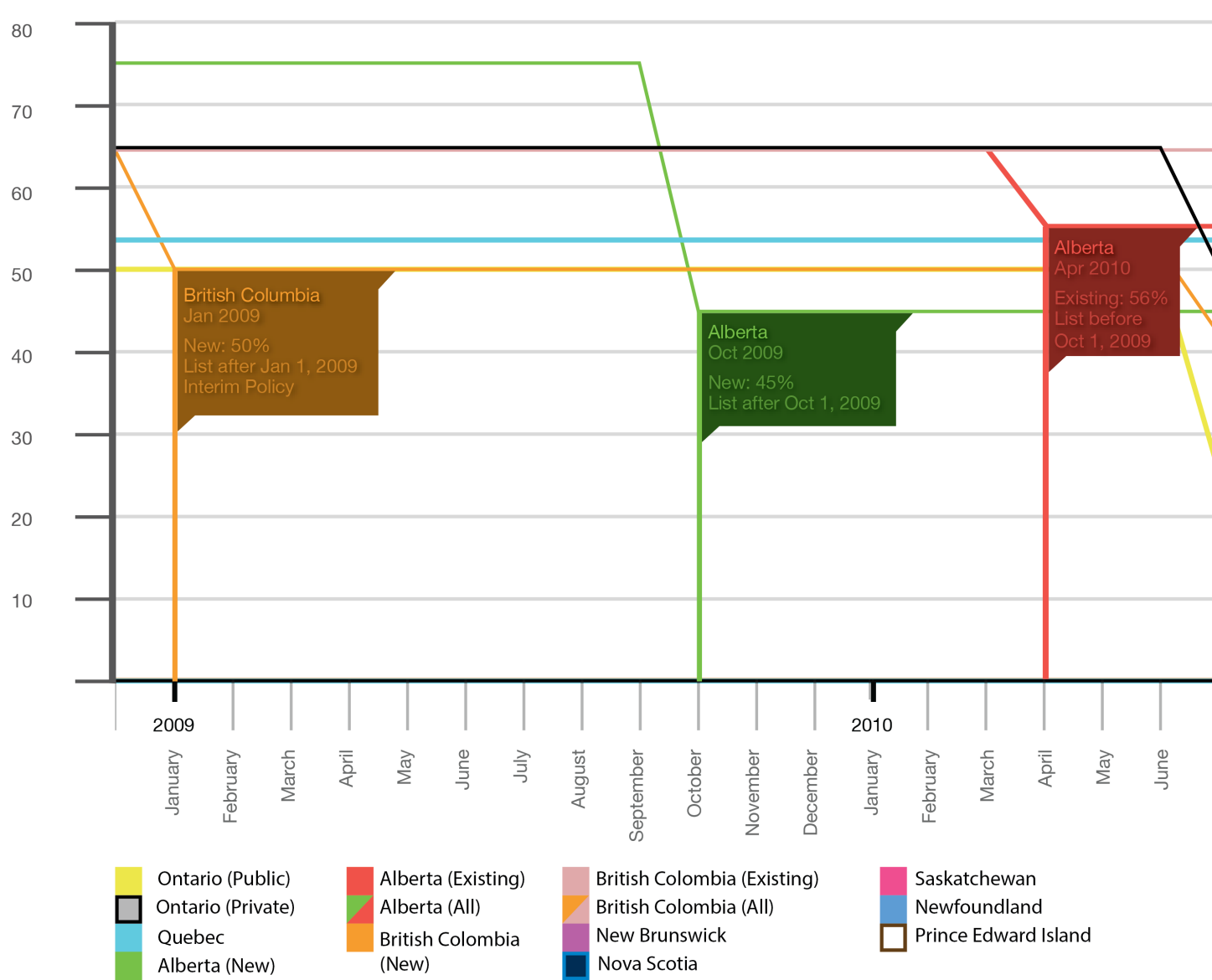
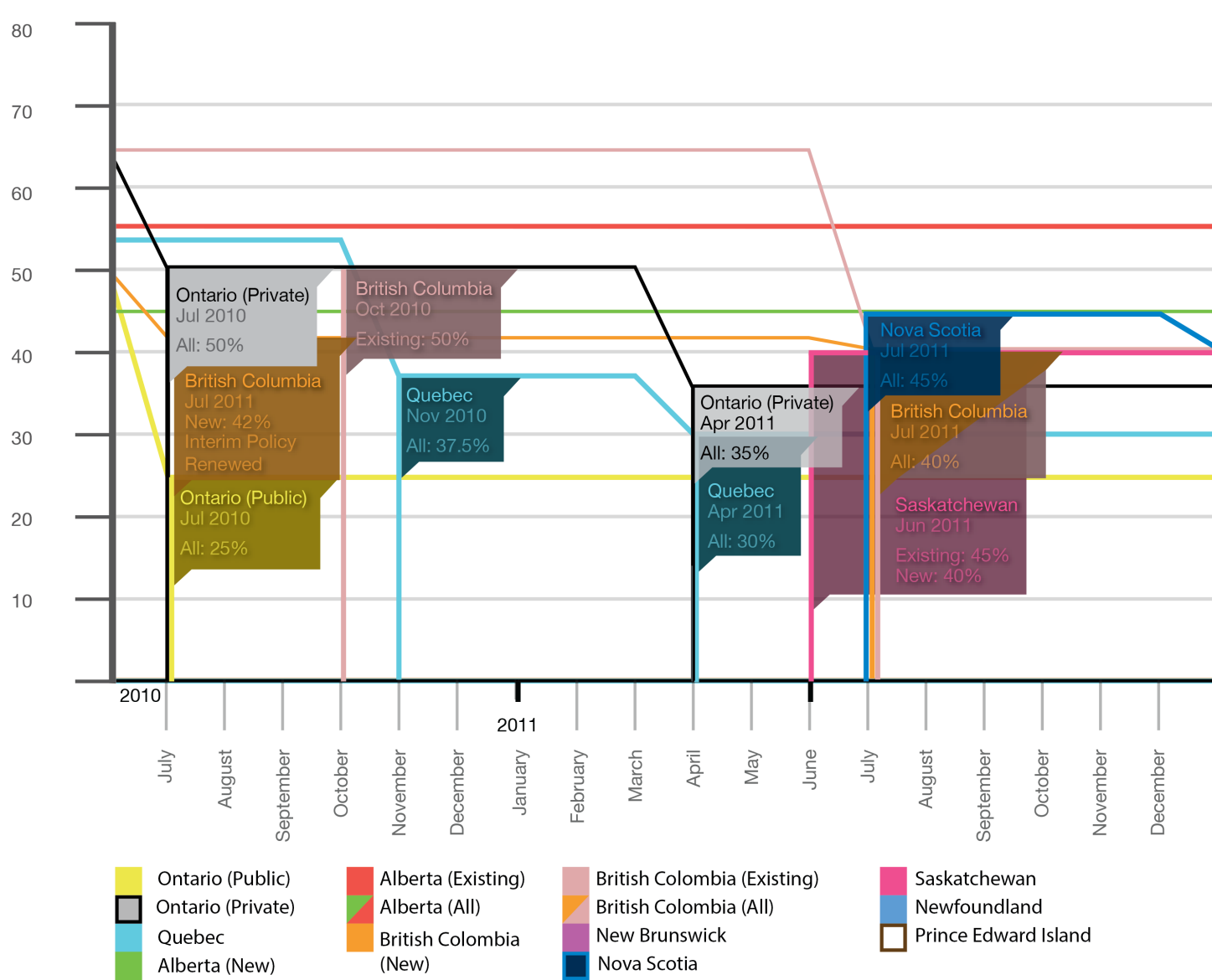
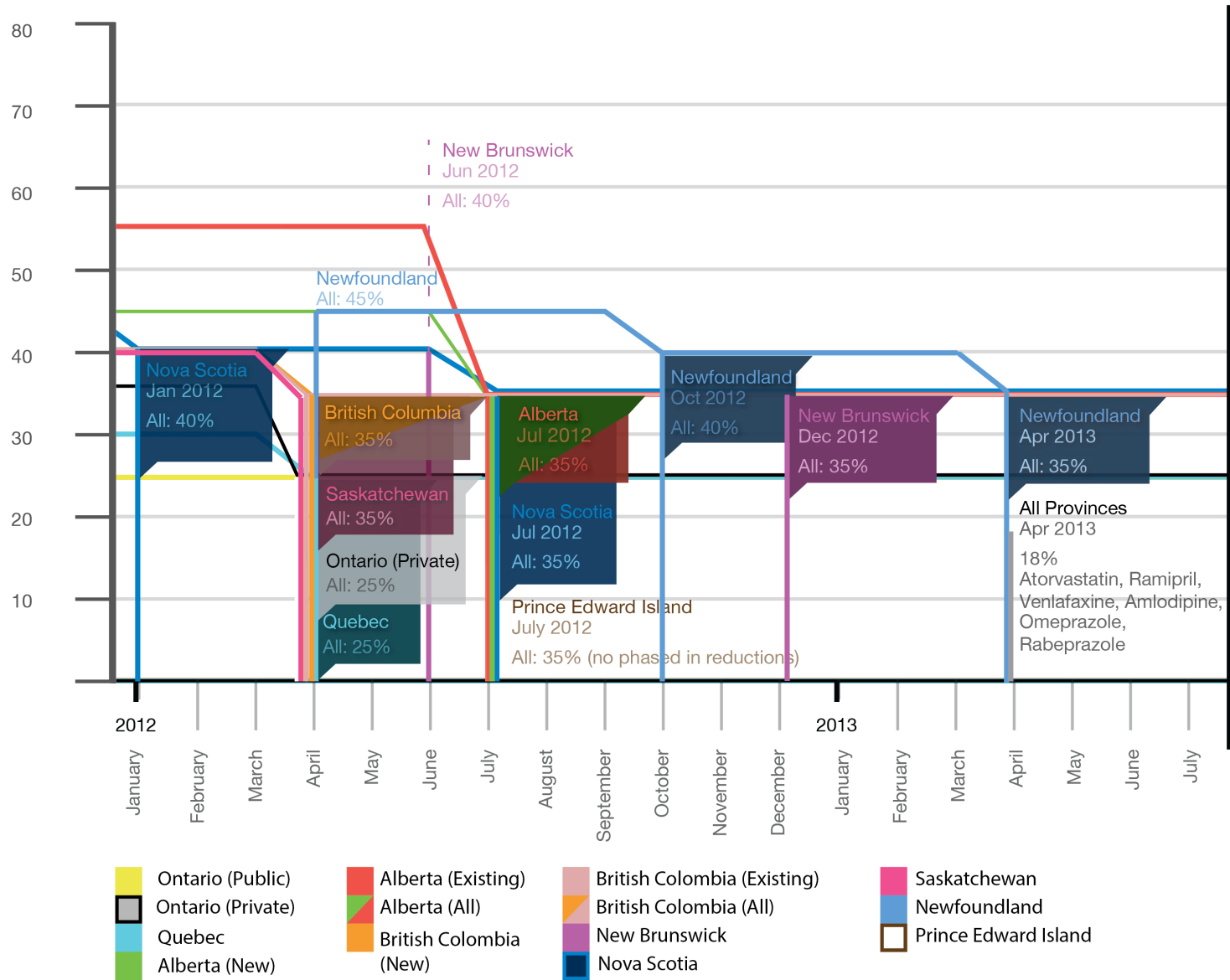


Figure 2 - Generic Drug Pricing Policy Timeline, by Province







In provinces with public drug plans that reimburse the mark up and dispensing fee as well, there are regulations that set a maximum reimbursement rate for all three components.⁷⁶ For private payers, however, the pharmacy mark up and dispensing fees charged are not regulated in any of the six provinces.⁷⁷ Major private insurers describe the reimbursement of the mark up and dispensing fees in all the provinces, except Quebec, to be generally based on “reasonable and customary charges”. Ultimately, however, pharmacies are free to set their own rates. Some private drug plans set a cap on the amount that they are willing to pay for these two components and in these plans, the beneficiary is expected to pay the difference.⁷⁸

The way that the mark up and dispensing fees are set and reimbursed is slightly different in Quebec. Quebec’s public drug plan, the Régie de l’Assurance Maladie (RAMQ), establishes the maximum that it is willing to pay for the markup and dispensing fee. For the private plans, pharmacies are free to set their own rates and according to the Competition Act; the charges should be “a competitive amount reflecting the economic reality of the pharmacy”.⁷⁹ Pharmacies are also not required to submit claims detailing how much is charged for each component.⁸⁰ In

⁷⁶ Competition Bureau, *Canadian Generic Drug Sector Study*.

⁷⁷ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

⁷⁸ Manulife Financial, “Understanding Limits on Pharmacy Mark-Ups and Dispensing Fees,” accessed October 5, 2013, https://repsourcepublic.manulife.com/wps/wcm/connect/cc4f080046b95e04ba19bb0b70778292/gb_hd_dispensingfees.pdf?MOD=AJPERES&CACHEID=cc4f080046b95e04ba19bb0b70778292; Great-West Life, “Ontario’s Drug System Changes Finalized, Implementation Set to Begin,” *GroupLine* 10, no. 08 (2008), http://www.greatwestlife.com/web5/groups/common/@public/documents/web_content/s7_009960.pdf; Sun Life Assurance Company of Canada, “Important Information About Your Drug Plan,” *Group Benefits News Focus Update* 275, no. 275 (April 14, 2011), accessed August 15, 2013, http://www.sunlife.ca/static/canada/Sponsor/About%20Group%20Benefits/Focus%20Update/2011/275/Focus_275.pdf; Sun Life Assurance Company of Canada, “Ontario Is Moving Ahead with Changes to the Drug System - Lowering Generic Drug Prices for All Ontario Residents,” *Group Benefits News Focus Update* 232, no. 232 (2010), accessed August 15, 2013, http://cdn.sunlife.com/static/canada/Smallbusiness/Focus%20news/2010%20issues/232/Focus_232%20SA.pdf.

⁷⁹ P. Couture, “Médicaments Génériques: la Baisse de Prix n’a Jamais eu Lieu,” trans. Google Translate, *Le Soleil*, 2013, accessed November 3, 2013, <http://www.lapresse.ca/le-soleil/affaires/consommation/201306/18/01-4662731-medicaments-generiques-la-baisse-de-prix-na-jamais-eu-lieu.php>; Association Québécoise des Pharmaciens Propriétaires, “How Is The Price of Prescription Drugs Set?”.

⁸⁰ Manulife Financial, “Understanding Limits on Pharmacy Mark-Ups and Dispensing Fees.”

other words, claims are submitted in total amounts and private plans reimburse that full amount not knowing how much they are paying for each component.⁸¹

1.2.1.2 Generic Drug Substitution Policies

The interchangeability of brand name and generic drugs is based on their bioequivalence, which is regulated and approved by Health Canada.⁸² Provincial governments have the jurisdiction to determine how this interchangeability is implemented. The same interchangeability laws apply within a province regardless of whether the prescription drug is paid for by public or private drug plans or even by out-of-pocket patients. Some provinces, such as Manitoba, Newfoundland and Labrador, Prince Edward Island (PEI), and Saskatchewan, mandate generic substitution for all payers by requiring the pharmacist to dispense the lowest cost interchangeable drug available (usually a generic drug). Regulations in Alberta, British Columbia, New Brunswick, Nova Scotia, Ontario, and Quebec, however, give the pharmacist the choice of substitution, provided that they do not violate any of the respective province's interchangeability laws.⁸³

The interchangeability laws of the provinces investigated in this study leave the choice of generic drug substitution up to the pharmacist. This is as long as the physician does not prescribe a specific drug manufacturer's product or does not indicate "no substitution" in the prescription. If these prescription restrictions are not present, then the pharmacist is legally permitted to substitute the prescribed drug with any of its interchangeable products, provided that the dispensed drug does not cost more than the drug prescribed. Within these legal boundaries, the

⁸¹ K. MacDonald, "Demystifying Drug Prices in Alberta," *Benefits Canada*, 2013, accessed August 30, 2013, <http://www.benefitscanada.com/benefits/health-benefits/demystifying-drug-prices-in-alberta-40886>; Sun Life Assurance Company of Canada, "Important Information About Your Drug Plan"; Manulife Financial, "Diversity in Drug Plans - Part One," accessed November 3, 2013, [http://groupbenefits.manulife.com/Canada/GB_v2.nsf/LookupFiles/EBNQ22003Diversityindrugplans/\\$File/scriptQ203.htm](http://groupbenefits.manulife.com/Canada/GB_v2.nsf/LookupFiles/EBNQ22003Diversityindrugplans/$File/scriptQ203.htm).

⁸² Canadian Agency for Drugs and Technologies in Health, "Similarities and Differences between Brand Name and Generic Drugs," last modified 2012, accessed September 15, 2013, <http://www.cadth.ca/en/resources/generics/similarities>.

⁸³ Competition Bureau, *Canadian Generic Drug Sector Study*.

pharmacist is free of any liability associated with the dispensing of an interchangeable prescription medication.⁸⁴

At the drug plan level, provincial public drug plans mandate generic substitution by strictly limiting reimbursement to the lowest-cost alternative.⁸⁵ As for private drug plans, it is up to the plan sponsor, either the employer or the individual patient, to decide whether their drug plan mandates generic substitution or not.⁸⁶ According to the Mercer survey in 2011, however, only 50% of the plans surveyed mandated generic substitution, and 80% liberally reimbursed the brand name drug if the prescriber simply specified “no substitution”.⁸⁷

1.2.1.3 Rebates/Professional Allowance

For many years generic drugs were reimbursed at a rate of 63% of the brand price. Generic drug manufacturers were willing to sell for less, and indeed did so to compete for pharmacy business.

⁸⁴ Government of Alberta, *Pharmaceutical Profession Act, RSA 2000, c P-12*, 2004, accessed November 15, 2013, <http://canlii.ca/t/j93b>; College of Pharmacists of British Columbia, *Pharmacists, Pharmacy Operations and Drug Scheduling Act*, 1998, http://library.bcpharmacists.org/D-Legislation_Standards/D-2_Provincial_Legislation/5007-PPODS.pdf; Government of British Columbia, *Health Professions Act [RSBC 1996] CHAPTER 183*, n.d., http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96183_01; New Brunswick Pharmaceutical Society, *Chapter 100: Consolidation Pharmacy Act*, n.d., <http://www.nbpharmacists.ca/LinkClick.aspx?fileticket=T93d9fQewn4%3d&tabid=244&mid=686>; Government of New Brunswick, *Prescription Drug Regulation, NB Reg 84-170*, n.d., accessed November 1, 2013, <http://canlii.ca/t/521sf>; Nova Scotia House of Assembly Office of the Legislative Counsel, *Pharmacy Act*, 2011, http://nslegislature.ca/legc/bills/61st_3rd/3rd_read/b013.htm; Government of Ontario, *Drug Interchangeability and Dispensing Fee Act, RSO 1990, c P.23*, n.d., accessed November 3, 2013, <http://canlii.ca/t/1j2v>; Gouvernement du Québec, *Chapitre P-10: Loi sur la pharmacie*, 2012, http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=P_10/P10.htm; Sun Life Assurance Company of Canada, “The Next Step in Generic Drug Substitution,” last modified 2012, accessed September 15, 2013, <http://www.sunlife.ca/static/canada/Planadvisor/About%20Group%20Benefits/Advisor%20communications/Advisor%20Communications%202012/September/Mandatory%20Generic%20Sponsor%20brochure%20GRP1756%20E.pdf>; Ontario College of Pharmacists, “Interchangeability,” *Pharmacy Connection* 15, no. 4 (2008), accessed October 15, 2013, [http://www.ocpinfo.com/Client/ocp/OCPhome.nsf/object/2008+Pharmacy+Connection/\\$file/PCx_Jul_Aug_08.pdf](http://www.ocpinfo.com/Client/ocp/OCPhome.nsf/object/2008+Pharmacy+Connection/$file/PCx_Jul_Aug_08.pdf); Competition Bureau, *Canadian Generic Drug Sector Study*.

⁸⁵ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; Anis, Harvard, and Marra, “Ontario’s Plunging Price-Caps on Generics: Deeper Dives May Drown Some Drugs.”

⁸⁶ Balaban et al., “Private Expenditures on Brand Name Prescription Drugs After Generic Entry”; Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

⁸⁷ F. J. Poirier and D. West, “Mercer 2011 Annual Drug Survey Results,” last modified 2011, accessed August 1, 2013, http://www.mercer.com/attachment.dyn?idContent=1432300&filePath=/attachments/English/111207_WB_Merger_Annual_Drug_survey_results_2011.pdf.

The pharmacy thus accrued the difference between the reimbursement price and the (lower) price at which they were able to procure the drug from the manufacturer. In practice, the generic drug manufacturer would invoice the pharmacy at the drug plan maximum reimbursement price (so that the pharmacy would receive this amount from the drug plan), but then provide off-invoice cash rebates, free goods, gifts and other payments to the pharmacy. Pharmacy professional associations refer to these payments as “professional allowances”. We refer to them collectively as “rebates”. Before the 2006 reimbursement reforms, rebates were estimated to account for about 40% to 60% of the total price of a generic drug sold to consumers.⁸⁸

The existence of these rebates presumably gave incentives for pharmacists to dispense generic versions of branded drugs, when such generics were deemed interchangeable by the provincial government drug plan. This would be true regardless of the reimbursement policies of the drug plan.⁸⁹

It seems very likely that the downward pressure on the drug plan generic reimbursement prices have reduced rebates. This is because the generic manufacturers paid the rebates from the difference in the reimbursement price and the generic firm’s “reservation price”. This reservation price is the lowest price that the generic could be profitably sold at, i.e., the generic firm’s minimum average production and distribution cost. The difference between the reimbursement price and the reservation price is called the “margin”. The generic drug manufacturer earned the portion of the margin left over after it paid rebates to the pharmacy.⁹⁰

As the reimbursement prices approached the reservation price, the margin shrank and thus there was less available to pay for rebates. Moreover, the generic drug manufacturer would

⁸⁸ Competition Bureau, *Canadian Generic Drug Sector Study*; Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*.

⁸⁹ Competition Bureau, *Canadian Generic Drug Sector Study*.

⁹⁰ Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*; A. Hollis and P. Grootendorst, *Tendering Generic Drugs: What Are the Risks?* (Canadian Generic Pharmaceutical Association, 2012), accessed August 1, 2013, http://www.canadiangenerics.ca/en/advocacy/docs/10.24.12%20Tendering%20Generic%20Drugs%20-%20What%20Are%20the%20Risks_FINAL.pdf.

presumably have less incentive to pay rebates because its portion of the margin would decline as well, reducing its incentive to compete aggressively for pharmacy business.⁹¹

The gradual reduction in the amount that the provincial government drug plans were willing to pay for generic drugs thus squeezed rebate amounts.⁹² The provincial governments introduced additional policies to reduce rebates. In Ontario in 2006, rebates earned on the dispensing to ODB beneficiaries were limited to 20% of the generic drug invoice price; moreover the rebates could be used only to finance the pharmacy's professional services. This precluded the payment of rebates in the form of gifts. This rebate policy did not apply to drugs dispensed to non-ODB beneficiaries.⁹³

In July 2010, the Ontario government banned rebates on generic drugs that were reimbursed by the ODB. The government also limited rebates allowed on generic drugs paid by private drug plans. The rebate amounts were reduced to 50% in July 2010, 35% in April 2011, and 25% in April 2012.⁹⁴ According to regulations, all rebates should be completely banned by 2014.⁹⁵

It is unclear whether the bans have indeed eliminated rebate payment completely. The reason is that pharmacies can circumvent the bans in several ways. First, if rebates earned on private plan sales are not regulated, then the rebates that the pharmacy would have received on public plan sales can be amalgamated with the rebates earned on private plan sales. Second, if rebates from

⁹¹ Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*; Hollis and Grootendorst, *Tendering Generic Drugs: What Are the Risks?*.

⁹² S. O. N. Grauer, A. Nador, and E. Rix, "Governments of British Columbia and Québec Announce Changes to Generic Drug Pricing," last modified 2010, accessed November 2, 2013, http://www.mccarthy.ca/article_detail.aspx?id=5204; British Columbia Ministry of Health Services, "Patients to Benefit from Lower Generic Drug Prices"; Alberta Health, "Alberta Pharmaceutical Strategy, Phase Two"; K. Lynas, "BC Government Reveals Plans to Lower Generic Drug Prices to 20% of Brand-Name Price by April 2014," *Canadian Pharmacists Journal* 146, no. 113 (2013), <http://cph.sagepub.com/content/146/1/13.full>; J. Wingrove, "In Alberta, Pharmacists Have a Bitter Pill to Dispense," *The Globe and Mail*, 2012, <http://www.theglobeandmail.com/news/national/in-alberta-pharmacists-have-a-bitter-pill-to-dispense/article533797/?page=all>.

⁹³ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

⁹⁴ Sun Life Assurance Company of Canada, "Changes to Ontario's Drug System," *Focus Update* 217 (2010), http://www.sunlife.ca/Canada/smallbusiness/Focus+news/Changes+to+Ontarios+drug+system?vgnLocale=en_CA; Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

⁹⁵ Ontario Ministry of Health and Long-Term Care, "Reforming Ontario's Drug System," last modified 2010, accessed December 1, 2013, <http://news.ontario.ca/mohlrc/en/2010/04/reforming-ontarios-drug-system.html>.

all generic drug sales are banned in a particular province, a pharmacy chain with a national presence can receive the rebates in the jurisdictions where rebates are banned in the jurisdictions where rebates are not banned. (Rebates are not explicitly regulated in provinces outside of Ontario and Quebec).⁹⁶ Third, the pharmacy chain can start manufacturing generic drug sales itself. By doing so, there is no payment of rebates between an independent generic manufacturer and a pharmacy. The pharmacy in effect would pay itself and hence be outside the reach of the regulations.⁹⁷

The Quebec government banned rebates in 1993, as part of the MFN clause requirement that the drug plan pay the ‘best available’ price.⁹⁸ Realizing that the bans were ineffective, however, the restrictions were relaxed in 2008.⁹⁹ Rebates of up to 20% of the pharmacy’s generic drug sales were permitted.¹⁰⁰ This percentage was reduced to 16.5% in April 2011 and again to 15% in April 2012.¹⁰¹

⁹⁶ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*.

⁹⁷ L. Moscu, “What’s In A Name? Ontario Pharmacies Fight To Substitute Brand-Name Drugs With Private-Label Equivalents,” last modified 2012, accessed November 2, 2013, <http://www.mondaq.com/canada/x/200530/trials+appeals+compensation/Whats+In+A+Name+Ontario+Pharmacies+Fight+To+Substitute+BrandName+Drugs+With+PrivateLabel+Equivalents>; J. O’Kane, “Supreme Court to Hear Appeal of Ontario Generic Drug Rules,” *The Globe and Mail*, 2012, <http://www.theglobeandmail.com/globe-investor/supreme-court-to-hear-appeal-of-ontario-generic-drug-rules/article4509428/>.

⁹⁸ Ward Health Strategies, *Generic Drugs in Canada: A Policy Paper* (Canadian Treatment Action Council, 2007), http://www.ctac.ca/uploads/Position%20Papers/2007%20EN_PP%20Generic_Drugs_in_Canada_April_2007_FINAL.pdf.

⁹⁹ Ibid.; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*; Competition Bureau, *Canadian Generic Drug Sector Study*; Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

¹⁰⁰ H. V. Nguyen, “Saving Public Money at Private Expense? Impact of Ontario’s Generic Drug Reimbursement Reform on Out-of-Pocket Expenditure” (University of Toronto [Unpublished Paper], 2012), http://haivannnguyen.ca/Drug%20Reform_Nguyen.pdf; Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

¹⁰¹ Canadian Pharmacists Association, “Quebec Government Reveals Details of Plan to Match Ontario Generic Drug Pricing,” *Canadian Pharmacist Journal* 144, no. 12 (2011), <http://cph.sagepub.com.myaccess.library.utoronto.ca/content/144/1/12.2.full>; The Jean Coutu Group (PJC) Inc., *The Jean Coutu Group (PJC) Inc. 2013 Annual Report*, 2013, http://corpo.jeancoutu.com/uploadedFiles/Corporate/Relations_Avec_Les_Investisseurs/RAQ42013En.pdf.

1.3 Literature Review

A considerable amount of literature has been published on the management of prescription drug costs by the provincial public drug plans. Studies that examine the ability of private drug plans to manage costs, however, are scarce. For the most part, the role of private drug plans is only mentioned briefly in studies that discuss prescription drug reimbursement policies and access in Canada.¹⁰²

One of the ways by which the ability of private plans to manage costs can be investigated is to examine the prices paid for generic drugs. Two drug plan policy papers did somewhat address the generic drug pricing issue for private plans; the Competition Bureau report published in 2008, and the working paper by Aidan Hollis released in 2009.¹⁰³

Even though the Competition Bureau report focused on issues faced by the public drug plans, the report also included an investigation of the impact of Ontario's 2006 policy reform (TDSPA) on the prices paid for generic drugs across Canada. It was reported that generic drug prices decreased for ODB plan beneficiaries by the TDSPA-required amount. Prices also decreased for both the public plan and private plans in Quebec. This was attributed to the MFN clause that requires generic drug manufacturers to match their prices in Quebec to the lowest available price offered to any other province. The rest of Canada did not benefit from the TDSPA price discounts. For Ontario's private drug plans and other provinces (except Quebec), prices of generic drugs that were available prior to the reform remained at the pre-TDSPA rates. Generic drugs that were introduced into the market after the 2006 reforms, however, were listed at a higher price, ranging from 70% to 75% of their interchangeable brand drug price.¹⁰⁴

¹⁰² Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; Competition Bureau, *Canadian Generic Drug Sector Study*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*; Ward Health Strategies, *Generic Drugs in Canada: A Policy Paper*; V. Paris and E. Docteur, *Pharmaceutical Pricing and Reimbursement Policies in Canada*, Working Paper (France: OECD Publishing, 2006), <http://www.oecd.org/canada/37868186.pdf>; A. Anis, "Pharmaceutical Policies in Canada: Another Example of Federal-Provincial Discord," *Canadian Medical Association journal* 162, no. 4 (2000): 523–526.

¹⁰³ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁰⁴ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

The competition bureau report further argued that private drug plans lacked the purchasing power to independently influence or lower the prices of generic drugs. This argument was based on the attempt made by the claims adjudicator Medavie Blue Cross to lower prices and reduce costs by initiating a tender for the antibiotic, clarithromycin. To tackle this issue, the report further recommended that private payers should attempt to arrange discount agreements with a select network of pharmacies.¹⁰⁵

The “Generic Drug Pricing and Procurement: A policy for Alberta” paper by Aidan Hollis mainly discussed key issues and principles of generic drug competition in the Canadian pharmaceutical market. It also evaluated the existing provincial policies and made policy recommendations for Alberta. As part of this analysis, the prices of generic drugs sold to Canada’s private drug plans in 2008 were investigated. Results were in conformity with what was reported by the 2008 Competition Bureau report. In Ontario, for example, prices of existing generic drug were also observed to remain at the pre-policy ODB rates. In fact, there was no significant change observed in the prices paid by Ontario’s private rug plans since 2005.¹⁰⁶

With a focus on the prices that private plans pay for generic drugs, a key limitation of these two studies was the investigation duration of study. Since they were both published at around 2008-09, they were limited to examining the prices of generic drugs up to the year 2008. The Competition Bureau analyzed the prices from July 2006 to June 2008.¹⁰⁷ The Hollis policy paper investigated the prices of generic drugs for a longer period of time, yet they were still only from 2005 to 2008.¹⁰⁸ This, therefore, meant that only the effect of the first policy reform in Ontario could be examined. Furthermore, the analyses ran for a select number of generic drugs. The policy paper analysis investigated the prices of the 10 most prescribed generic drugs for private

¹⁰⁵ Ibid.

¹⁰⁶ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

¹⁰⁷ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁰⁸ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

drug plans in 2008.¹⁰⁹ The competition bureau report examined the prices of the top 10 generic drugs dispensed for the entire study period.¹¹⁰

Another way by which the ability of private drug plans to manage drug costs can be investigated is to examine the rate of generic drug substitution. However, there is a clear gap in the academic literature on research that examines generic drug substitution rates from the perspective of private drug plans. More specifically, we are unaware of any studies that assessed whether the changes in generic drug prices had an impact on the private plans' generic drug substitution rates.

A recently published paper examined the impact of generic drug entry on private drug plan's expenditure on brand name drugs. As part of the analysis, expenditure on generic drugs was compared to that on brand drugs from the year 2000 to 2009. In spite of generic drug entry into the market, private drug plans were found to still spend considerable amounts on brand name drugs. Generic substitution was evaluated in a sense that, had generic drugs been dispensed instead of the brand drugs, private drug plans would have saved \$107.8 million from 2000 to 2009. Spending on three drug classes in Ontario was examined: Proton Pump Inhibitors (PPIs), Selective Serotonin Reuptake Inhibitors (SSRIs), and Angiotensin-Converting Enzyme (ACE) inhibitors. Actual generic substitution rates (share of total prescriptions) and the change in substitution rates over time were not examined in this study. Only the number of units dispensed as generic drugs was compared to the number of units sold as brand drugs for private plans in Ontario, up to the year 2009.¹¹¹

Another recently published paper provided some insight on the policies introduced by private plan sponsors to contain costs. Private drug plans' usage of cost-containment strategies in 2010 was surveyed and compared to the usage in 1998. Strategies examined include the usage of cost-shifting policies, setting maximum allowances, as well as mandating generic substitution. More plans appear to have started to use cost-shifting policies in order to pass on the increased drug costs onto patients than they had in 1998. These include the increased usage of co-payment as

¹⁰⁹ Ibid.

¹¹⁰ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹¹¹ Balaban et al., "Private Expenditures on Brand Name Prescription Drugs After Generic Entry."

well as requirements that patients pay the pharmacy dispensing fee. It was concluded, however, that private plans continue to under-utilize these cost-controlling strategies, especially when compared to their level of use by public drug plans.¹¹²

A major limitation of this study was that the data obtained was for all of Canada, and not segregated by province. Therefore, it was not possible to determine whether there was a difference in generic substitution trends depending on the province that the private drug plans originated from. Furthermore, data was cross-sectional and limited to the year 2010, and so the change in utilization over time could not be examined. This limitation is particularly an issue for the provinces where the generic drug pricing policies that lowered the prices of generic drugs were only implemented after the year 2010, and therefore the possible effect of the change in price on generic substitution could not be assessed.¹¹³

A study published in 1994 assessed the impact of several provincial policies that were used to promote generic substitution. One of the factors analyzed was the impact of drug price on generic substitution rates. However, analysis was done for the public drug plans. Estimates were calculated using Ontario, Quebec, and British Columbia data from 1981 to 1988. In order to estimate generic substitution rates, the ratio of the number of generic prescriptions to the total number prescriptions dispensed was calculated and used as a proxy. It was concluded that price did have an impact on generic substitution, where lower generic drug prices relative to the brand name price induced higher substitution rates. However, the impact was considered negligible compared to other variables that were estimated to have a greater effect on increasing generic substitution. More influential factors included the removal of the then-effective legal liability on pharmacists to substitute generic drugs, and implementing provincial policies that would strictly only allow the dispensing of generic drugs. Prices were expected to have a greater impact if the consumer's level of awareness of generic drug's lower prices was increased and if consumers directly benefitted from the lower prices.¹¹⁴

¹¹² Kratzer et al., "Cost-Control Mechanisms in Canadian Private Drug Plans."

¹¹³ Ibid.

¹¹⁴ Anis, "Substitution Laws, Insurance Coverage and Generic Drug Use."

All of the above-mentioned policy papers focused on the cost management of drug plans. Two important aspects of drug cost management is the ability to reduce costs by lowering prices and increasing generic substitution rates. However, to date, academic literature has mainly focused on these two issues from the perspective of the provincial public drug plans. Very little research exists that examines the pricing and substitution of generic drugs from the perspective of private drug plans. In the two studies that do shed some light on the prices paid by private plans, prices were examined until 2008 only. Therefore, the effect of just one provincial policy reform (TDSPA) on private plan prices was examined. Analysis was also limited to the prices of the top 10 selling generics at the time. As for generic substitution, the effect of the change in price of generic drugs on their substitution patterns from the perspective of private drug plans has also not been previously examined in the academic literature.

The research presented in this paper, therefore, aims to build upon these studies by providing a more comprehensive analysis of the generic drug pricing and reimbursement policies from the perspective of private drug plans. Prices are studied for a longer period of time, from 2003 to 2012, and for six provinces in Canada. Therefore the effect of several provincial government interventions implemented to reduce generic drug prices is evaluated. Prices paid before governmental intervention is also examined, with the aim of identifying whether private drug plans have been able to independently negotiate lower prices. Furthermore, this paper also presents an analysis that has not been previously conducted with regards to generic drug substitution by private drug plans in Canada; to assess whether a change in price had an effect on the private plan generic substitution policies. The results presented in this study provide invaluable insights on the previously overlooked yet equally important providers of prescription drug coverage; the private drug plans.

1.4 Objectives

With the rise in drug costs and the recent developments in the pricing mechanism of this dynamic market, questions have been raised about the ability of private plans to manage costs, and their long-term sustainability.¹¹⁵ The extent to which private plans have been actively

¹¹⁵ Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans”; Stevenson, *An End to Blank Cheques: Getting More Value Out of Employer Drug Plans (white Paper)*; Gershon, *A Report of the Ontario Citizens’ Council: Private Drug Insurance in Ontario*.

managing their drug plan costs is unclear. This study aims to provide further evidence on the willingness and ability of private plans to manage costs. More specifically, this study will focus on two major aspects of drug cost management: the prices paid for generic drugs and the extent to which generic substitution has been implemented by private plans.

The following two main research questions will be addressed:

Pre-price regulation period:

1. Have private drug plans been able to obtain lower generic drugs prices without governmental intervention?

This will inform the degree of bargaining power that employer sponsored drug plans have with pharmacies.

Post-price regulation period:

2. With the reduction in prices, have private plans taken steps to increase generic fill rates? In other words, have private drug plans taken advantage of the decreasing generic drug prices by mandating more generic substitution policies over time?

Analysis will be conducted for the provinces of Alberta, British Columbia, New Brunswick, Nova Scotia, Ontario, and Quebec, from 2003 to 2012.

In addition, the case of Ontario will be taken up for further analysis by examining the change in the difference between private plan and public plan prices over time, and estimating the impact of price regulation on private drug plan expenditure.

Chapter 2 METHODS

The purpose of this chapter is to introduce the data used to explore prescription drug pricing and generic drug substitution rates for private drug plans. The data collected was by drug plan type, for six Canadian provinces, and from the period of 2003 to 2012. This chapter also includes a description of the analysis approach taken to achieve the study's objectives.

2 Methods Used to Estimate Price per Unit and Fill Rates of Generic Drugs in Public and Private Drug Plans, by Province, 2003-2012

2.1 Data

2.1.1 Data Source

The data used for analysis was extracted from the IMS-Brogan's Pharmastat database; these data provide information on the use and cost of prescription drugs dispensed in community pharmacies in Canada and reimbursement by private and public drug plans.¹¹⁶ This database captures prescription drug claims reimbursed by most of the public drug plans and by about 67% of the private plans. Spending by uninsured patients, copayments, or any other beneficiary out-of-pocket payments are not captured.¹¹⁷ The Pharmastat contains, for each drug, drug plan spending on drug ingredient cost and markups combined, the number of units (for example: tablet, caplet, or capsule) of the drug reimbursed, and the number of prescriptions of the drug reimbursed. These data are available by manufacturer type (brand vs. generic), manufacturer name, province, plan type (provincial government vs. private), and by quarter. Drugs are defined as a unique combination of molecule (or chemical) and dosage form, such as venlafaxine extended release oral capsules (figure 3). The pharmacy dispensing fee is not included, except in the case of the drugs purchased by Québec's private drug plans and the province of

¹¹⁶ M. Law, "Money Left on the Table: Generic Drug Prices in Canada," *Healthcare Policy* 8, no. 3 (2013): 17–25.

¹¹⁷ IMS Brogan, "Pharmastat," last modified 2012, accessed November 1, 2013, <http://imsbrogansolutions.com/main.php?i=22&t=services>.

Newfoundland. In these data, the dispensing fee is combined with the drug ingredient cost and markup.

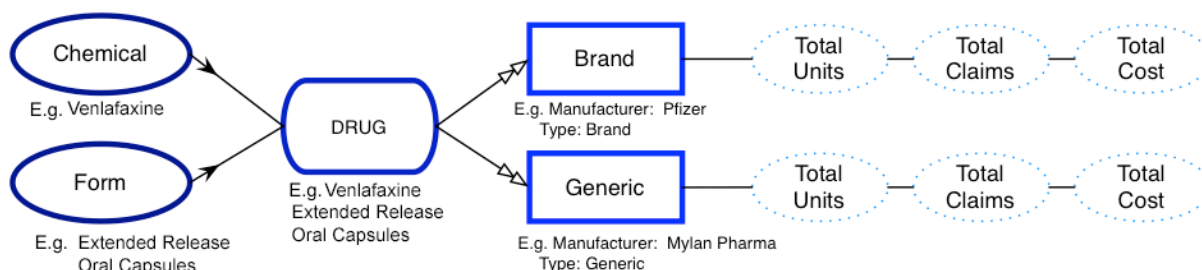


Figure 3 - Illustration of Data Organization

2.1.2 Data Management

We obtained the Pharmastat data for the period 2003 quarter 1 (Q1) to 2012 quarter 4 (Q4). The provincial government drug plans routinely exempt liquid preparations and other dosage forms with relatively high manufacturing costs from the generic pricing regulations. We thus focused exclusively on the oral solid dosage forms: tablets, caplets and capsules. The different dosage release varieties of the same chemical (regular release, delayed release, extended release, sublingual and oral dissolving) were treated as different drugs. We confirmed using the ODB e-formulary that these different drugs were not considered therapeutically interchangeable.¹¹⁸

The manufacturer type variable in the Pharmastat database distinguishes between brand and generic manufacturers. This variable was measured with error: some of the manufacturers were listed as “other”, instead of brand or generic. For instance, the generic manufacturer Mylan was identified as “other”, not generic. We thus manually identified the manufacturer type (brand vs. generic) of those listed as “other” based on the name of the manufacturer (using the manufacturer name variable). We dropped from the data set the small number of observations in which the manufacturer name was missing. Figure 4 provides a visual depiction of the data management and cleaning process.

¹¹⁸ Ontario Ministry of Health and Long-Term Care, “Drugs Funded by Ontario Drug Benefit (ODB) Program E-Formulary,” last modified 2013, accessed July 19, 2013, http://www.health.gov.on.ca/en/pro/programs/drugs/odb_eformulary.aspx.

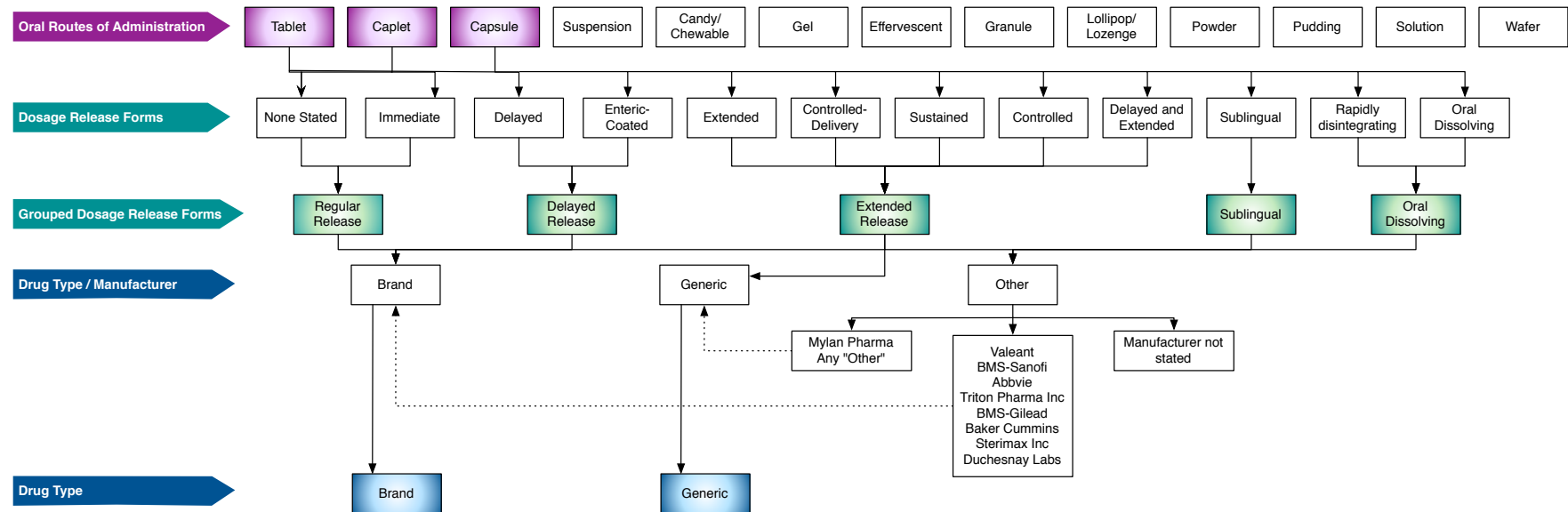


Figure 4 - Data Management Process

2.1.3 Inclusion/Exclusion Criteria

The provinces that are included in the study are Alberta, British Columbia, New Brunswick, Nova Scotia, Ontario, and Quebec. Newfoundland, PEI, Manitoba, and Saskatchewan were excluded. Newfoundland public drug plan data was available semiannually and total cost included the dispensing fee, and therefore, its results would not be comparable to the results of the other provinces. Saskatchewan was not included because of its long-standing history of using tendering, in the form of standing-offer-contracts, to procure generic drugs.¹¹⁹ Therefore, the results from analyzing the change in generic drug prices and fill rates in Saskatchewan would not be valid or comparable to the other provinces' results. Data on Manitoba and PEI were not available in the Pharmastat.

As indicated above, we focused on the oral solid generic drugs. Some of these drugs, however, were excluded from the analysis sample. We excluded birth control pills, warfarin, acetaminophen, and other generic drugs that have been available in generic form for many years. Generic manufacturers have developed their own branded formulations of these drugs and thus multiple brand and generic versions were released at different dates, with different prices, and it is difficult to establish interchangeability of the different generics. We also excluded small volume generic drugs as well as generics that were not restricted by the generic drug reimbursement reforms. The most commercially important generic drugs were identified as those drugs that accounted for 80% of total national expenditure over the time period and had \$1 million in total reimbursed costs over the whole study period. We consulted with a generic industry analyst, Jeff Mehlretter from Mylan Inc., to identify the generics that were not subject to the reimbursement rules introduced by the provincial plans since 2006. These excluded generics consist mainly of single-source generics; governments routinely exempted such drugs from the reimbursement rules.¹²⁰ We also excluded those generics that were launched during the reform era, as we could gather no baseline (pre-reform) price data. These consist of generic drugs that were launched after late 2009, or 2007 in the case of Québec.

¹¹⁹ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

¹²⁰ Competition Bureau, *Canadian Generic Drug Sector Study*.

General Exclusion Criteria

Data missing values (total cost, units, claims)

Drugs with generic versions for many years prior to 2003

Drugs with generics introduced post-policy

Drug-Specific Exclusion Criteria

Attribute	Reason/Effect
Single-source generics (or only 2 manufacturers)	Exempt from price regulations
'Not a benefit' drug	Exempt from price regulations
Contracts with exclusive listing/Tendering	Exempt from price regulations
Drugs with multiple brands	Affect generic share values
Introduction of new dosage strengths (varying price and time of introduction)	Affect price per unit values
Conversion from prescription to over-the-counter drug during the study period	Affect generic share and price per unit values
Other reasons - Public plan generic prices did not follow provincial policy	Affect price per unit values

Table 2 - Drug Exclusion Criteria

The data cleaning process resulted in the inclusion of a total of 31 drugs, covered by both public and private drug plans in all of the provinces, in the study dataset.¹²¹ In addition to the price analysis, these 31 drugs were also used in the analysis and investigation of the remaining study research objectives. A table presented in Appendix A contains information on the 31 drugs' chemical name, brand and generic manufacturer names, as well as their pharmacological category.

2.2 Analysis of Private and Public Drug Plan Generic Reimbursement Prices

The analysis dataset contained information on the number of units, prescriptions and total reimbursement of 31 oral solid drugs produced by all of the generic manufacturers combined (i.e. total generic drug number of units, prescriptions and cost for each of the 31 oral solid drug), for each of the 6 provinces, by payer type (public vs. private) and quarter from 2003Q1 to 2012Q4. Separately for each of the 31 drugs, and for each province, we calculated and plotted the

¹²¹ 27 drugs were studied for Quebec, since three of the generic drugs were introduced post-2008 policy.

quarterly unit reimbursement prices (price per tablet, caplet, or capsule) paid by the private and public drug plans. We inspected these graphs to assess the extent to which private plans were able to obtain the same prices as the public plans, both during the pre-reform period and the period when the government mandated the price reductions.

The preceding analysis examined private – public price differences for each different drug (and province). Next, for each province separately, we examined for each quarter, the average private and public drug plan price across all the 31 generic drugs. This gave some indication of overall pricing of the generic drugs. Using these province and payer-type specific reimbursement prices, we then calculated the percentage changes in the payer-type specific average price before and after the changes in provincial government generic reimbursement policy. This allowed us to assess, among other things, whether the percentage reductions in private drug plan prices matched those in the public drug plans.

Quebec's private plan prices included the dispensing fee. For the purpose of comparison, we adjusted the average public plan unit price to include the dispensing fee as well. This was done using the maximum and minimum basic dispensing fee rates set by the RAMQ.¹²² For each generic drug in each quarter, the total number of prescriptions reimbursed was multiplied by each dispensing fee rate to estimate the possible range of total dispensing fee paid. The maximum and minimum total dispensing fee estimates were then added to the total cost and the adjusted average price per unit range was calculated. The quarterly adjusted average public plan unit price and the average private plan unit price was plotted and examined.

The dispensing fee amount paid by Quebec's public drug plan was calculated with some error. This is because the RAMQ dispensing fee reimbursement rate depends on the prescription size, type, whether the prescription is new or a refill, in addition to other factors. However, for the purpose of better comparison, using the maximum and minimum basic dispensing fee rates was sufficient to derive an estimate of the total cost, including dispensing fee, paid by the public plan in Quebec.

¹²² Régie de l'Assurance Maladie du Québec, *Entente Relative À L'Assurance Maladie*, 2006, accessed November 1, 2013, <http://collections.banq.qc.ca/ark:/52327/bs39611>; Régie de l'Assurance Maladie du Québec, *Entente Relative À L'Assurance Maladie*, 2010, <http://www.ramq.gouv.qc.ca/sitecollectiondocuments/professionnels/manuels/260-pharmaciens/entente-aqpp-msss.pdf>.

2.2.1 Secondary Analysis of the Private – Public Differences in Generic Reimbursement Prices in Ontario

We re-analyzed differences between the unit prices for the 31 generic drugs paid by the private and public drug plans using an econometric approach. We specified and estimated, for the province of Ontario, the parameters of a linear regression model of this price difference. The private-public plan unit price difference was modeled using quarter-specific binary indicator variables (2003Q1 was the reference) and drug binary indicator variables (31 total) as covariates. The quarter binary indicator variables (or quarter “dummies” for short) were used to indicate the change over time (relative to the reference quarter 2003Q1) for this outcome. These dummies were of primary interest: they indicated the change over time in the difference in private-public generic drug unit prices and thus informed the question as to the extent to which the private plans were able to obtain the same prices as the public plans. Drug dummies were also included in the model; they were used to control for time-invariant differences across drugs in the private-public price difference.

The regression model took the form:

$$diffPerUnitPrice_{i,t} = \alpha + \beta_t Quarter_t + \gamma_i Drug_i + \varepsilon_{i,t}$$

where i indexes drugs from 1 to 31 and t indexes the quarter, from 2003Q2 to 2012Q4. The $\varepsilon_{i,t}$ is the error term; this is the combined influence on the private-public price difference of unmodelled factors (i.e. factors that are unique to each combination of quarter and drug).

The parameters were estimated using ordinary least squares (OLS), and a heteroskedasticity robust covariance matrix estimator was used to obtain estimates of the standard errors of the OLS parameter estimates. In the regression, observations were weighted by the number of units paid for by drug plans. Thus more commonly used drugs were given more weights in the parameter estimates. The quarter dummies and the associated estimated 95% confidence intervals were plotted to assess the change over time in the difference in private-public generic drug unit prices.

2.2.2 Analysis to Estimate Potential Savings As a Result of Generic Drug Price Regulation for Private Plans in Ontario (2010-2012)

Previewing our results, prices paid by private drug plans in Ontario remained higher than those paid by the public payer until the Ontario government explicitly regulated the private plan reimbursement prices. We estimated the value to private payers of this price regulation. To do so, we first found the average private plan price per unit of the 31 drugs each quarter; this was the total spending on these drugs divided by the total number of units reimbursed. We compared the actual price paid after prices were regulated to what prices would have been had they been unregulated. To estimate these latter “counterfactual” prices, we extrapolated the linear trend in pre-regulation private prices (2008 Quarter 2 – 2010 Quarter 2) into the post regulation period (2010 Quarter 3 to 2012 Quarter 4). The difference between counterfactual and actual prices was multiplied by the number of units reimbursed by private plans to estimate the savings attributable to the government price regulation.

2.3 Analysis of Private Drug Plan Generic Substitution Rates

We also aim to assess whether private plans enacted measures to increase the rate of generic drug substitution in cases where private plan reimbursement declined. We thus focused on the 31 generic drugs that we identified to be affected by the price regulations in this part of the analysis as well.

Using generic drug share of total claims as a proxy for generic substitution is a method that has been previously used by several Canadian and US-based studies that researched the effects of various cost containment policies on the rates of generic substitution.¹²³ Thus, the generic drug share of total claims was calculated by dividing the total number of generic version claims over the total number of generic and brand name version claims. Similar to the price calculations, this was calculated quarterly for each of the 31 drugs in every province:

¹²³ Anis, “Substitution Laws, Insurance Coverage and Generic Drug Use”; T. B. Gibson, R. J. Ozminowski, and R. Z. Goetzel, “The Effects of Prescription Drug Cost Sharing: A Review of the Evidence,” *The American Journal of Managed Care* 11, no. 11 (November 2005): 730–740.

$$GenericDrugShare_{i,j,t} = \frac{GenericDrugClaims_{i,j,t}}{GenericDrugClaims_{i,j,t} + BrandDrugClaims_{i,j,t}}$$

i : drug

j : province

t : quarter

Two generic share values are generated for each drug, a public drug plan share and a private drug plan share:

$$gsrPub_{i,j,t} = \frac{claimsPublicGeneric_{i,j,t}}{claimsPublicGeneric_{i,j,t} + claimsPublicBrand_{i,j,t}}$$

$$gsrPriv_{i,j,t} = \frac{claimsPrivGeneric_{i,j,t}}{claimsPrivGeneric_{i,j,t} + claimsPrivBrand_{i,j,t}}$$

For each of the 31 prescription drugs, and for each province, we assessed the change in the generic substitution rate by plotting and examining the quarterly private and public plans' generic drug share of total prescriptions graphs from 2003 to 2012. The graphs were inspected to assess whether private plans' generic fill rates increased as a result of the price reductions (during the period of price regulation).

All of the analysis was executed using the statistical analysis software STATA 12.0.

Chapter 3 RESULTS

The purpose of this chapter is to present our findings regarding: the prices paid by private drug plans for commonly prescribed generic drugs (before and during regulation), and the private plans' generic drug fill rates. The change in the difference between Ontario's private and public plan generic drug unit prices over time is detailed. Estimated savings to Ontario's private plans from the government-mandated price reductions are also presented.

3 Results for Price per Unit and Fill Rates of Generic Drugs, by Province and Drug Plan Type, 2003-2012

3.1 Results for Generic Drug Prices Paid by Private Drug Plans Prior to Government Intervention, by Drug and Province

3.1.1 Graphical Analysis: Generic Drug Prices Prior to Government Intervention

For each province and drug separately, we plotted the quarterly unit price paid by the public and private drug plans over the period 2003 to 2012. A vertical reference line marked the quarter at which a provincial government began to regulate the prices charged private drug plans. During the time period prior to the first reference line, prices of generic drugs sold to private drug plans were not regulated. The Quebec and Nova Scotia governments did not explicitly regulate the prices charged to private plans; as we noted earlier, however, the reductions in prices charged to private plans appear to have been the result of government intervention.¹²⁴ The graphs for the drug Amiodarone HCL regular release are presented in figure 5 as an example. These are indicative of the results observed for the 30 other drugs, which are presented in Appendix B.

¹²⁴ Institut National d'Excellence en Sante et en Services Sociaux, "Price Policy"; Nova Scotia Department of Health and Wellness, "Fair Drug Pricing Act To Become Law On July 1."

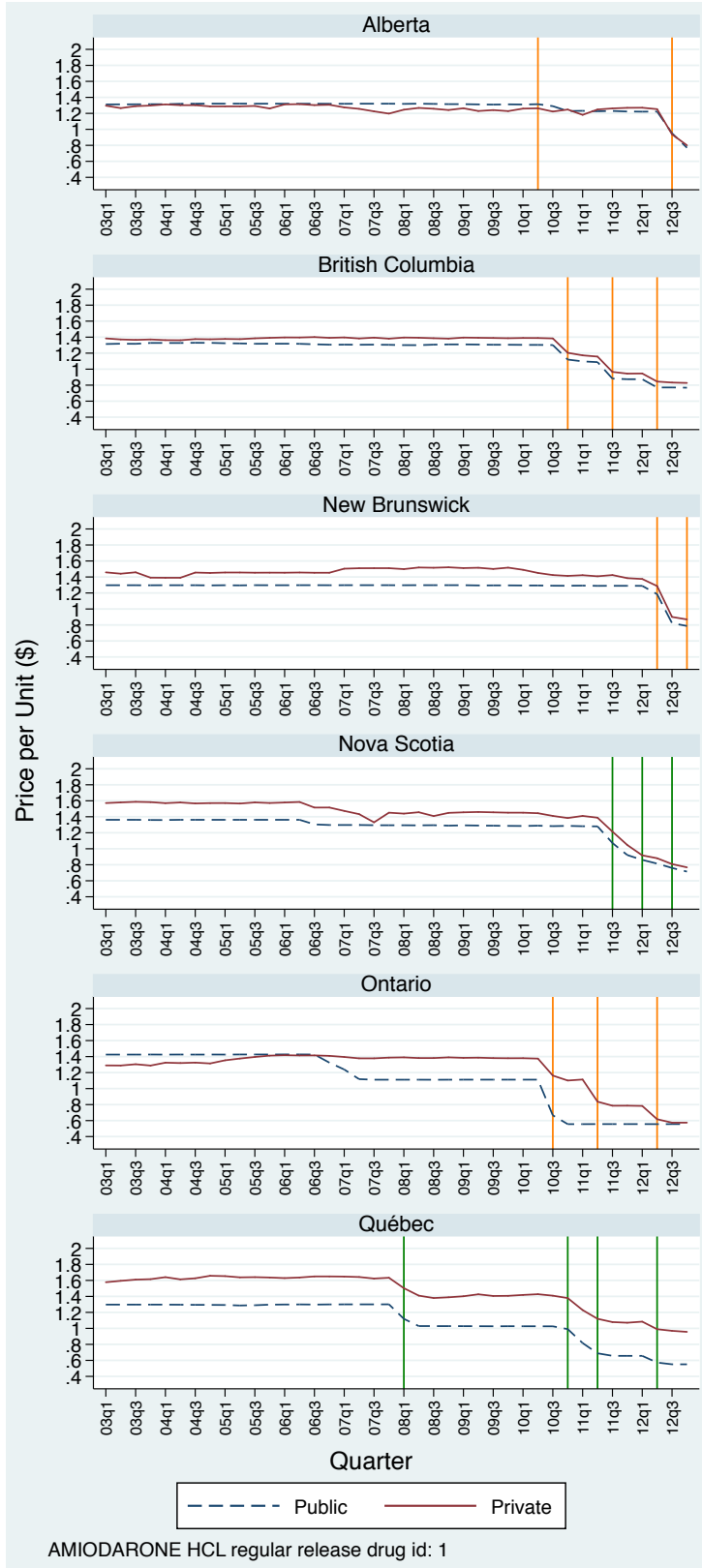


Figure 5 - Amiodarone Regular Release Generic Drug Price per Unit - by Drug Plan Type, Province (2003-2012)

Graphical analysis revealed that the prices of generic drugs paid for by private plans did not significantly decrease prior to government intervention. This outcome was consistent for all six provinces.

Ontario's generic drug pricing policies for private drug plans were introduced in July 2010.

Prior to that, prices of generic drugs offered to private drug plans were unregulated.¹²⁵

Examination of Ontario's generic drug price graphs revealed that there was no marked decrease in prices during the period prior to the first reference line positioned at quarter 3 of 2010.

Alberta, British Columbia, and New Brunswick generic drug prices were unregulated for private drug plans up until the last three years of the study period. The first generic drug price policy reform introduced was marked on the graphs by a vertical reference line at 2010Q2 (April) for Alberta, quarter 2010Q4 (October) for British Columbia, and 2012Q2 (June) for New Brunswick.¹²⁶ There was no significant decrease in generic drug prices paid by private drug plans observed during the period where prices were unregulated.¹²⁷

In Quebec and Nova Scotia, prices regulations did not specifically address the rates paid by private drug plans.¹²⁸ In both provinces, however, the price-per-unit graphs illustrated that there was no significant decrease in prices observed during the period when there was no interference by the provincial governments. Prices only decreased in time with their respective province's regulations that applied to the public drug plans.

To summarize, in all provinces, analysis of the price per unit – time graphs of each drug revealed that there has been no significant decrease in prices during the period when price discounts were not mandated by the government.

¹²⁵ Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

¹²⁶ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹²⁷ It should be noted that Alberta and British Columbia's generic drug pricing policy reforms, when first introduced, differentiated between new and pre-existing generic drugs. However, the generic drugs that met the inclusion criteria for this study did not include new generics and therefore these dates were not utilized to differentiate between pre- and post-policy prices.

¹²⁸ Institut National d'Excellence en Sante et en Services Sociaux, "Price Policy"; Nova Scotia Department of Health and Wellness, "Fair Drug Pricing Act To Become Law On July 1."

3.2 Results for Generic Drug Prices Paid by Private Drug Plans Post Government Intervention, by Province and Drug

Preceding analysis revealed that private drug plan prices decreased, but only when the provincial governments mandated the reductions. Price drops were observed at the time of each province-specific reference line in all provinces (with one exception in Alberta). This was analyzed further by calculating the percentage change in average generic drug prices due to each provincial pricing policy. Results are presented by province in the following section.

3.2.1 Percentage Change in Private Drug Plan Generic Reimbursement Prices

In this section, estimates of the percentage change in the average price per unit for private plans (hereafter referred to as private plan prices)¹²⁹ and the average price per unit for public plans (hereafter referred to as public plan prices)¹³⁰ due to government intervention are presented. Data analysis revealed that when the government-mandated price discounts affected both public plan and private plan prices, both plan types experienced the same percentage decrease in price. This occurred in provinces where the government explicitly regulated the prices for all payers and in provinces where the intervention was less direct. When the discounts applied to the private plan prices only, the actual percentage decrease in the average generic drug prices calculated matched the percentage decrease required by the provincial generic drug pricing policies, with one exception in Alberta. Results are presented in the following six subsections, one for each province.

The average price per unit graphs of the sample generic drugs sold to public and private drug plans over the study period are also presented graphically in each subsection. This was done to provide a visual example of the price changes over time for both drug plan types in each province. A vertical reference line on the time x-axis marked the quarter at which a provincial pricing regulation came into effect. Calculations are presented in Appendix C.

¹²⁹ It should be noted that this referral applies to this section only.

¹³⁰ It should be noted that this referral applies to this section only.

3.2.1.1 Alberta

Alberta's first provincial generic drug pricing policy reform applied to both public and private drug plans. Prior to that, prices of generic drugs sold in the province were around 75% of the reference brand name drug price.¹³¹ Effective April 2010, the prices of existing generic drugs were required to decrease to 56% of the brand name drug price.¹³² Therefore, a 25% decrease in prices was expected for that time period.

Actual percentage decrease in prices calculated using the data revealed that private plan prices did not decrease as required. In fact, both public and private drug plans experienced an initial increase in price of 1.8% during the second quarter of 2010, the quarter at which the regulation was expected to take effect. Average prices immediately decreased by just 2.1% in the following quarter. From 2010Q3 to 2012Q2, private plan prices remained relatively high, with two minor price cuts of about 0.9% in 2011Q2, and 1.5% in 2012Q2. Overall, the difference calculated between the pre-April 2010 prices and the 2012Q2 prices (last quarter before the next drug pricing policy was scheduled to take effect) revealed that private plan prices decreased by only 2.4%. In comparison, public plan prices also decreased by only about 5% during that same time period.

The second drug pricing policy reform that took place in Alberta was implemented in July 2012 (2012Q3). Generic drug prices were required to decrease from the previous 56% to a maximum of 35% of the brand name drug price, a 37.5% reduction in prices.¹³³ Actual percentages observed for that time period were 32% decrease for private plan prices and 33% decrease for public plan prices.

¹³¹ Alberta Health, "Alberta Pharmaceutical Strategy, Phase Two."

¹³² Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹³³ Ibid.

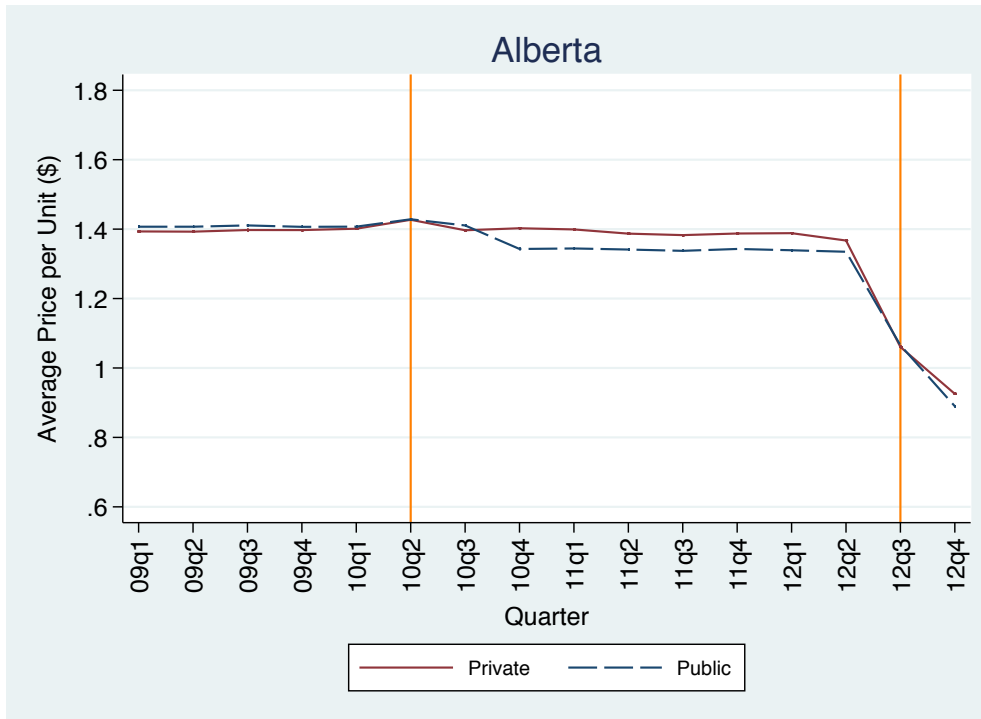


Figure 6 - Average Generic Drug Price per Unit - by Drug Plan Type (Alberta, 2009-2012)

3.2.1.2 British Columbia

Pre-2010, generic drugs in British Columbia were reimbursed at an average of 65% of the reference brand drug.¹³⁴ Three pricing policy reforms for existing generic drugs were implemented during the study period. All three generic drug pricing policy reforms applied to both public and private drug plan prices.¹³⁵

Effective October 2010 (2010Q4), reimbursement rates were required to decrease by 23% to 50% of the brand name drug price.¹³⁶ Actual percentages observed were 11% decrease for private plans and 10% decrease for public plans.

In July 2011 (2011Q3), the next drug pricing policy reform came into effect, requiring prices to be set at 40% of the brand name drug price.¹³⁷ A decrease of 20% was expected. Data analysis

¹³⁴ British Columbia Ministry of Health Services, "Patients to Benefit from Lower Generic Drug Prices."

¹³⁵ Ibid.; Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹³⁶ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

revealed that private plan prices decreased by 19% and public plan prices decreased by 20% during that time period.

The final policy reform observed during the study period was implemented in April 2012 (2012Q2). Regulations required generic drugs to be reimbursed at a maximum rate of 35% of the reference brand drug price, a 12.5% drop in prices.¹³⁸ A 12% decrease in private plan prices and 13% decrease in public plan prices were calculated using the data.

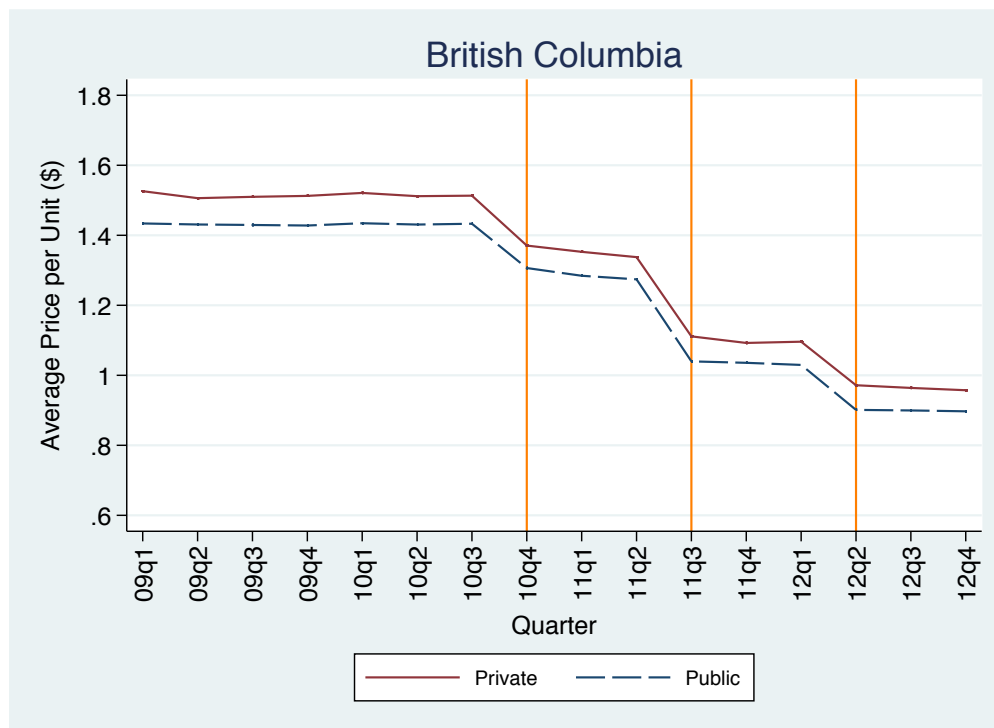


Figure 7 - Average Generic Drug Price per Unit - by Drug Plan Type (British Columbia, 2009-2012)

Unlike what was observed in Alberta, British Columbia's generic drug prices decreased during the quarter of policy implementation. It was not necessary to take into consideration some time to allow for prices to adjust when the percentage decrease in prices was calculated due to a policy reform.

¹³⁷ Ibid.

¹³⁸ Ibid.

3.2.1.3 New Brunswick

According to the New Brunswick Department of Health, prior to June 2012, generic drug prices ranged from 50% to 70% of brand drug price.¹³⁹

In June 2012 (2012Q2), the prices of generic drugs for all plans were expected to drop to 40% of the reference brand drug price.¹⁴⁰ This meant that a decrease of 20-43% in prices was expected, depending on the initial price. Actual percentage decrease in prices calculated using the data revealed that prices decreased by 28% for private drug plans and 30% for public drug plans, well within the expected range.

The next generic drug pricing policy reform was scheduled to take effect in December 2012 (2012Q4).¹⁴¹ However, since the dataset is limited to the fourth quarter of 2012, it was not possible to observe the effects of this policy reform on the prices of generic drugs paid for by New Brunswick's drug plans.

¹³⁹ New Brunswick Department of Health, "About Drug Pricing," accessed July 11, 2013, <http://www.gnb.ca/0212/drugs/pricing-e.asp>.

¹⁴⁰ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹⁴¹ Ibid.

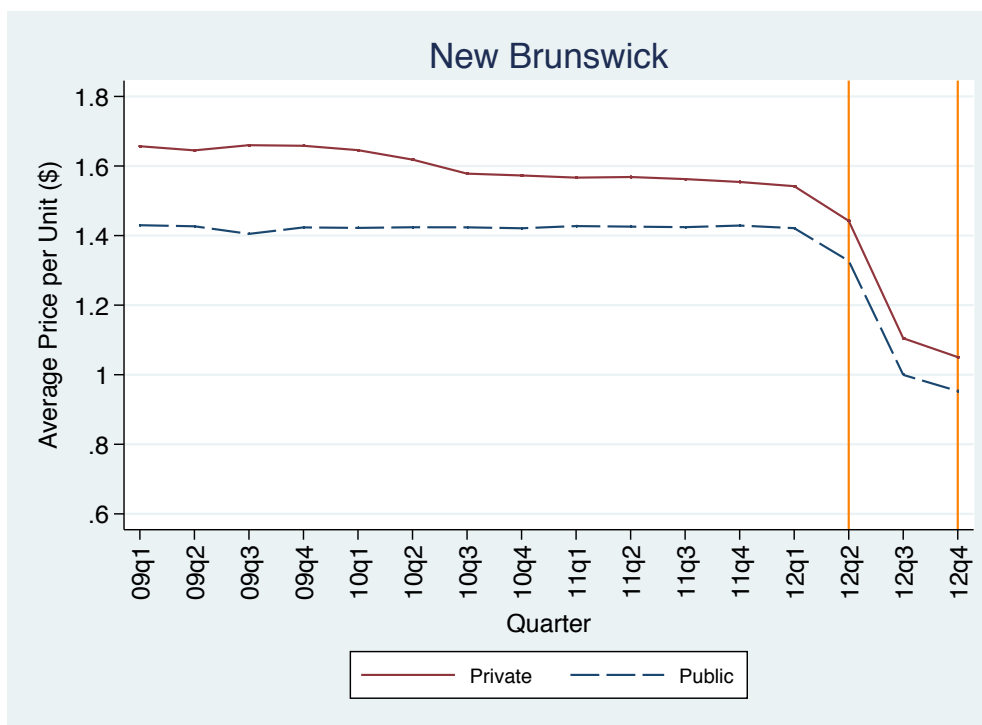


Figure 8 - Average Generic Drug Price per Unit - by Drug Plan Type (New Brunswick, 2009-2012)

3.2.1.4 Ontario

The first generic drug pricing policy that included private drug plans was implemented in July 2010 (2010Q3). Prior to that, prices of generic drugs sold to private drug plans were unregulated.¹⁴²

According to a Competition Bureau report, prices paid by private drug plans for generic drugs ranged from 63% to 75% of the brand drug price.¹⁴³ The 2010 drug pricing policy reform required a reduction of private plan prices to 50% of the reference brand drug price.¹⁴⁴

Therefore, a 21% to 33% decrease in price was expected to occur due to the policy reform. Data analysis revealed that private plan prices decreased by about 14% during that period. Therefore,

¹⁴² Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁴³ Ibid.

¹⁴⁴ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

a difference of about 5% was observed between the expected and actual percentage decrease in private plan prices.

The same generic drug pricing policy applied to public plan prices, but with different reimbursement rates. Effective July 2010 (2010Q3), regulations dictated that public drug plans would pay no more than 25% of the brand drug price for a generic drug. Prior to this regulation, generic drugs were reimbursed at a rate of 50% of the interchangeable brand drug price.¹⁴⁵ Therefore, a 50% decrease in public plan prices was required. The actual percentage decrease obtained from the data was 45%. Similar to what was observed for private drug plans, a difference of about 5% was observed between the expected and actual percentage decrease in public plan prices.

In April 2011 (2011Q2), the next generic drug pricing policy that targeted private drug plans was implemented. Prices paid by private drug plans for generic drugs were required to decrease from 50% to 35% of the reference brand drug price.¹⁴⁶ Therefore, private plan prices were expected to decrease by 30%. Actual percentage change calculated revealed that private plan prices were reduced by 29% during that period.

The last phase of the generic drug pricing policy reforms implemented during the study period was in April 2012 (2012Q2). Prices of generic drugs sold to private drug plans were expected to decrease by 29%, from 35% to 25% of the reference brand drug price.¹⁴⁷ In other words, private plan prices were expected to match the prices of generic drugs paid for by public drug plans. Actual percentage change in private plan price calculated revealed that prices decreased by about 26%.

During the last two quarters of 2012, the average price of generic drugs paid for by private drug plans was higher by only about 3% than the public drug plan's prices. However, both the minimum and maximum generic drug price values observed being paid for by public drug plans were higher than the prices paid for by private drug plans.

¹⁴⁵ Ibid.

¹⁴⁶ Ibid.

¹⁴⁷ Ibid.

Overall, private plan prices were required to decrease by 60%, from 63% to 25% of brand drug price, over the 3-year period.¹⁴⁸ By calculating the percentage change in the average generic drug price per unit using pre- July 2010 and post- April 2012 regulation prices, the actual percentage decrease observed was 57%.

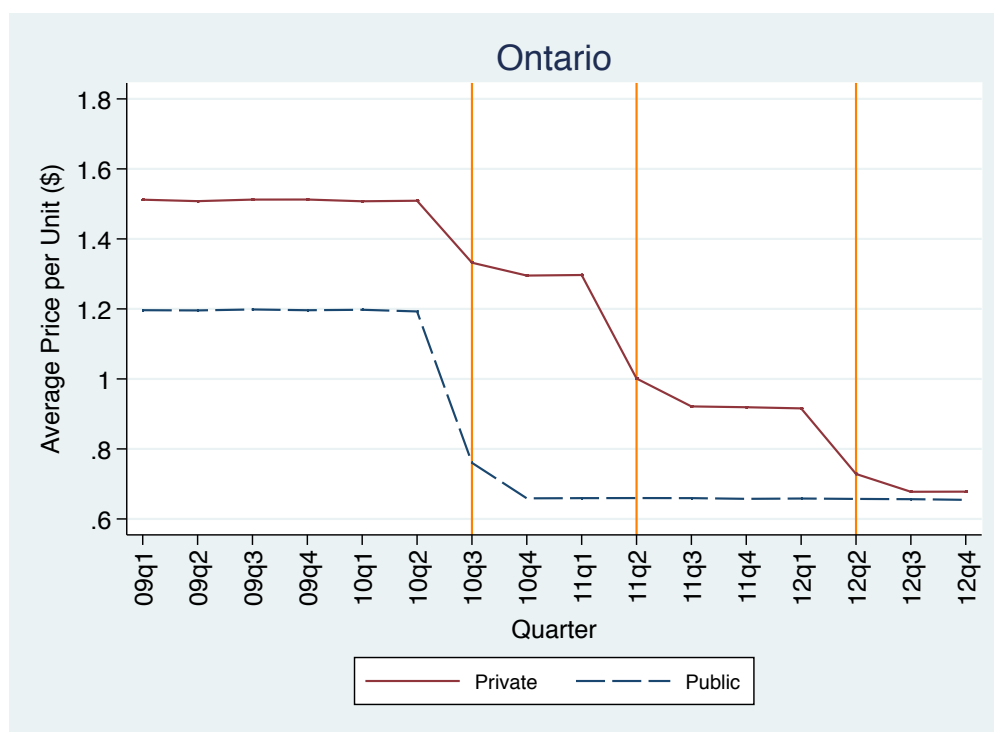


Figure 9 - Average Generic Drug Price per Unit - by Drug Plan Type (Ontario, 2009-2012)

3.2.1.5 Nova Scotia

Effective July 2011, prices were reduced for Nova Scotia's public drug plan in three stages over one year.¹⁴⁹ Private plan prices were observed to decrease in time with the regulations that applied to the province's public drug plan.

Generic drug pricing policy reforms were introduced for Nova Scotia's public drug plan in July 2011. Prior to that, prices were about 63% of the brand name drug price.¹⁵⁰ The July 2011

¹⁴⁸ Ibid.; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁴⁹ Nova Scotia Department of Health and Wellness, "Nova Scotia's Fair Drug Prices Plan," last modified 2012, accessed July 12, 2013, <https://www.gov.ns.ca/dhw/fairdrugprices/prices-plan.asp>.

regulations required an overall reduction in generic drug prices to 35% of the equivalent brand drug price. Reductions were implemented in three stages over a one-year period. Prices were expected to decrease to 45% in July 2011, 40% in January 2012 and finally to 35% of the brand name drug price in July 2012.¹⁵¹

Effective July 2011 (2011Q3), the first phase of the policy reform required a reduction of around 29% in public plan price. That is, a decrease from an average of 63% to 45% of the brand name drug price.¹⁵² Calculations produced an outcome of 17.7% decrease in private plan prices and 19.7% decrease in public plan prices.

The next policy reform was scheduled to take effect in January 2012 (2012Q1). A decrease of about 11% in prices was required, from 45% to 40% of the brand drug price.¹⁵³ A reduction of around 16% in private plan prices and 11% in public plan prices was observed. For private plans, the expected price discount was attained during the quarter at which the policy was implemented.

Effective July 2012 (2012Q3), public drug plans were expected to benefit from a further reduction in prices. Regulations required prices of generic drugs to decrease from 40% to 35% of the brand drug price.¹⁵⁴ Therefore, an average of about 12.5% decrease in prices was expected. A reduction of around 15% in public plan prices and 14.5% in private plan prices was observed between the average prices paid before and after the quarter of policy implementations.

¹⁵⁰ D. Moulton, "Provincial Squeeze on Generic Prices Continues," *Canadian Medical Association journal* 183, no. 14 (2011): E1049–1050.

¹⁵¹ Nova Scotia Department of Health and Wellness, "Nova Scotia's Fair Drug Prices Plan."

¹⁵² Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹⁵³ Ibid.

¹⁵⁴ Ibid.

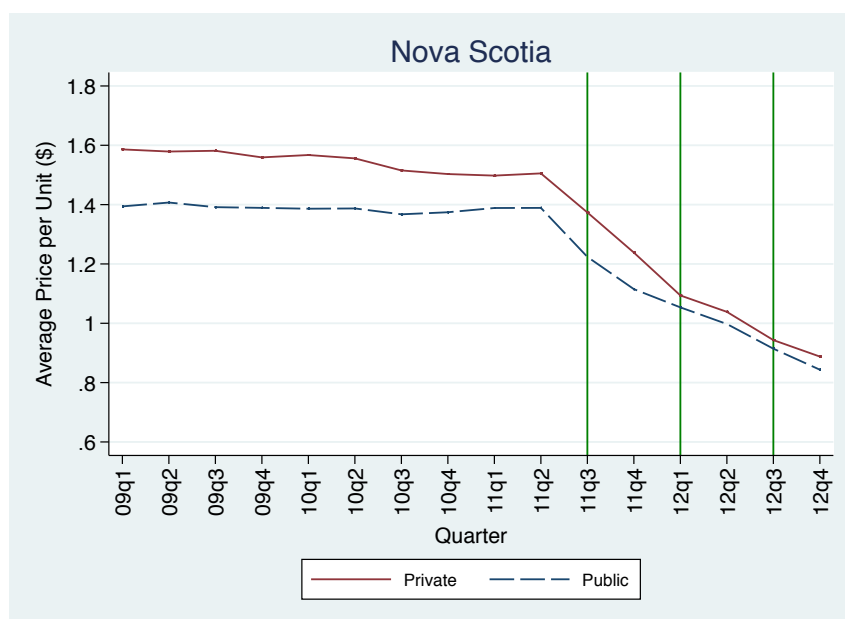


Figure 10 - Average Generic Drug Price per Unit, by Drug Plan Type (Nova Scotia, 2009-2012)

3.2.1.6 Québec

Analysis revealed that prices decreased in time with the policy reforms that applied to Quebec's public drug plan. The change in the prices paid with each reduction was calculated, but it was not possible to estimate the exact price discounts since the private drug plan claims data included the dispensing fee.

Table 3 presents the results obtained from calculating the changes in private and public plan prices throughout the period of generic drug pricing policy reforms.

Date of generic drug price policy reform (Month/Year)	Plan Type	Average Price as a % of Brand Price (Policy)		Expected % Decrease in Price	Average Price-per-Unit (\$) (Data)		Actual % Decrease in Price	Difference (Expected - Actual)
		Before	After		Before	After		
02/2008	Private	63	54	14	1.874952	1.586151	15	-1
	Public	63	54	14	1.450164	1.242786	14*	0
11/2010 & 04/2011	Private	54	30	44	1.575936	1.265342	20	24
	Public	54	30	44	1.141421	0.7758281	32	11
04/2012	Private	30	25	17	1.259001	1.168582	7	10
	Public	30	25	17	0.7742527	0.6834199	12	5

Table 3 - Expected & Actual Percentage Decrease in Generic Drug Price per Unit Due to Each Price Policy Reform, by Plan Type. (Quebec, 2003-2012)

* Expected percentage decrease achieved during the quarter of policy implementation.

There was no marked difference between the actual and expected change in price due to the 2008 public plan price policy reform.

The November 2010 (2010Q4) and April 2011(2011Q1) regulations were implemented one quarter apart. Graphical analysis revealed that these two generic drug pricing policy reforms appeared to have a combined single effect on reducing prices. Therefore, the mathematical analysis was conducted according to that.

November 2010 regulations required a price decrease from 54% to 37.5% of brand drug price; April 2011 required a further decrease to 30%.¹⁵⁵ Therefore, an average of about 44% decrease in prices was expected for that period. Calculations produced a 33% decrease in public plan prices and a 20% decrease in private plan prices. Private plan prices needed a further 13% decrease in prices to the match the public plan's percentage decrease in price.

The final phase of the reduction in prices regulations observed in this study period was set to take effect in April 2012 (2012Q2). Public plan prices were to be reduced from 30% to 25%, a decrease of 17%, in order to match the prices offered in Ontario.¹⁵⁶ Actual percentage change in price calculated from the dataset produced results indicating that the prices paid by the public plan decreased by 12% and the prices paid by the private drug plans by 7%. Private plan prices needed to decrease by another 5% in order to match Quebec's public drug plan percentage decrease in price.

During the last 2 quarters of 2012, the average price charged for the generic drugs sold to Quebec's public drug plan were the same as Ontario's public plan prices (\$0.66 per unit). Québec's private plan prices, however, were about 1.7 times as much as Ontario's private plan prices. The average price per unit was \$0.68 in Ontario versus \$1.17 in Quebec. It is important to note that Quebec's private plan prices included the pharmacy dispensing fee, while Ontario's private plan prices did not.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid.

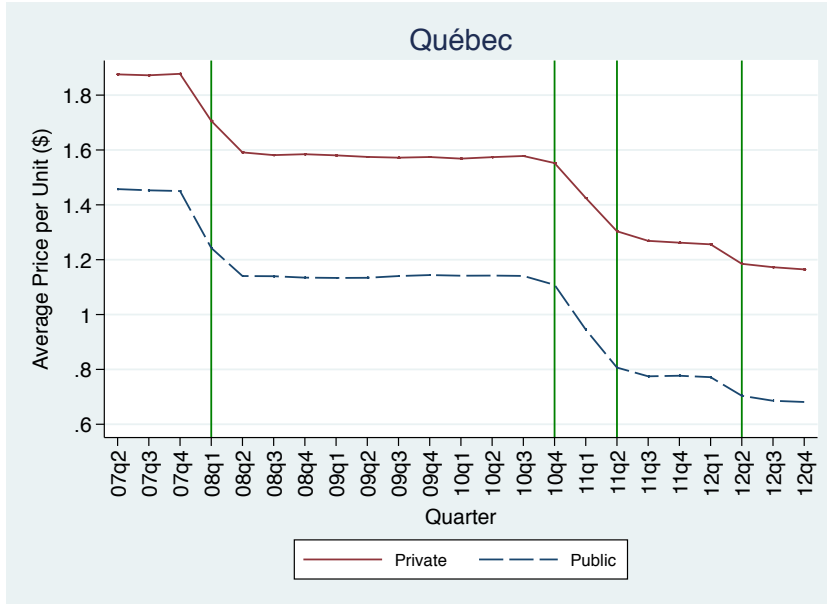


Figure 11 - Average Generic Drug Price per Unit - by Drug Plan Type (Quebec, 2007-2012)

Next, we re-estimated the average public plan prices (including dispensing fee estimates) in order to make the prices of both plan types more comparable. The resulting graph provided stronger evidence that private and public plan prices were reduced by the same rates, owing to government intervention (figure 12).

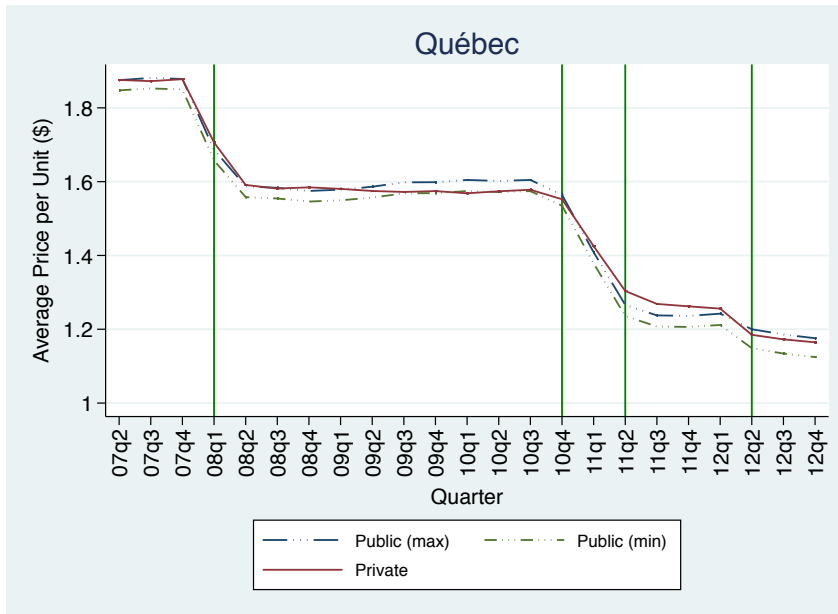


Figure 12 - Average Generic Drug Price per Unit Including Dispensing Fee - by Drug Plan Type (Quebec, 2007-2012)

3.3 Case Study: Ontario Private Drug Plans

3.3.1 Results for Change in the Difference Between Private Plan and Public Plan Generic Reimbursement Price since 2003Q1

We estimated the parameters of the private-public unit price difference linear regression model for the 31 generic drugs over the period 2003-2012. The graph of the quarter dummy estimates, and their 95% confidence intervals, is presented below. The regression results table is provided in Appendix D.

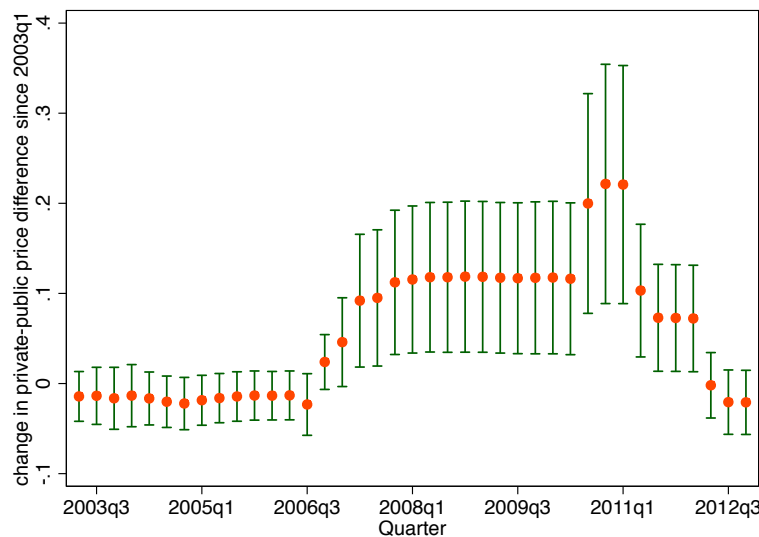


Figure 13 - Change in Private-Public Price Difference, Ontario (2003-2012)

Estimates of the quarter binary indicator variable indicate that there was no significant change in the difference between the prices paid by private and public drug plans in Ontario up to 2007Q1. Starting in 2007Q2, the difference in prices was estimated to be greater than the difference in prices paid in 2003Q1. The greatest difference was estimated to be during the period of 2010Q3 to 2011Q1, where the difference between private and public plan prices was \$0.22 higher per unit than the difference in 2003Q1. Starting in 2011Q2, the relative difference value started to decrease, but was still higher than the reference value in 2003Q1. In 2012Q2, the difference in prices paid by private and public drug plans was less than the difference in 2003Q1. The difference in prices continued to diminish to a final value of \$0.021 per unit in 2012Q4, meaning that the difference in prices paid in 2012Q4 was less by \$0.021 per unit than the difference between private and public plan prices in 2003Q1.

3.3.2 Private Drug Plan Estimated Potential Savings As a Result of Price Regulation (2010-2012)

To investigate Ontario's private drug plan market further; the impact of generic drug price regulations on private drug plan expenditure was investigated by predicting the total generic drug expenditure that would have been spent had the pre-policy prices continued to be used. This predicted amount was compared to the actual amount spent on generic drugs during that period.

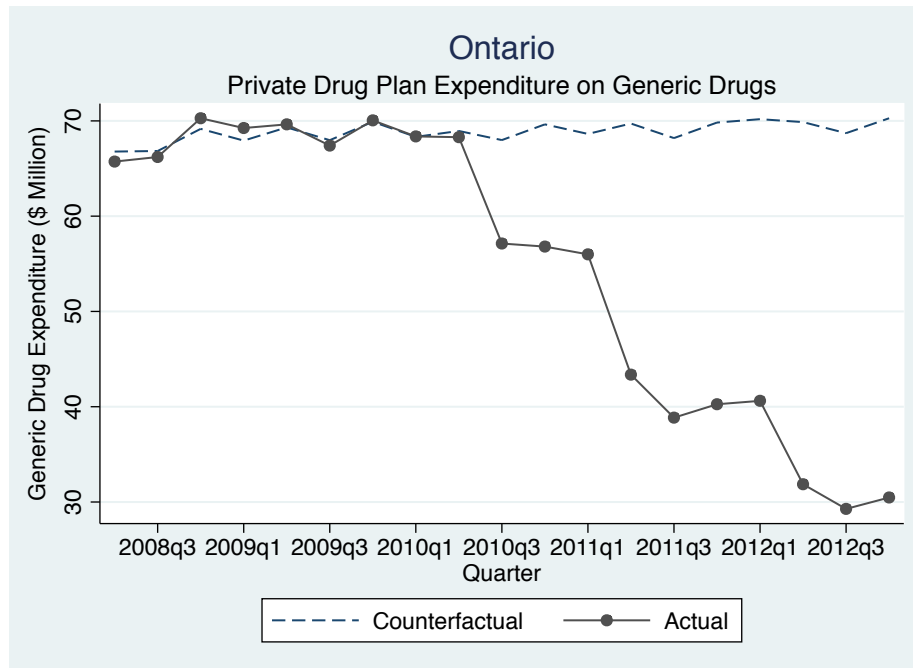


Figure 14 - Ontario Private Drug Plan Expenditure on Generic Drugs - Counterfactual vs. Actual (2010-2012)

Figure 13 shows private drug plan's actual expenditure on generic drugs in Ontario throughout the period of price regulation and illustrates post-policy expenditure estimates in the case where prices did not change. From the third quarter of 2010 to the end of 2012, the counterfactual expenditure was predicted to have been \$693 million, while the total actual expenditure for that time period was \$425 million. Prediction results showed that had prices been unregulated, private drug plans would have spent \$268.4 million more than they actually did. In other words, a comparison between actual and predicted post-policy expenditure indicated that private drug plan expenditure on generic drugs dropped by \$268.4 million due to the post-policy changes in generic drug prices in Ontario.

3.4 Results for Changes in Generic Drug Substitution Rates, Calculated as Changes in Generic Share of Total Claims by Plan Type, per Province (2003-2012)

3.4.1 Graphical Analysis

In this section, we assess whether private drug plans have taken advantage of the reduction in generic drug prices post-government intervention by mandating more generic substitution policies over time. The share of generic drug claims, calculated as a proportion of total drug claims, was plotted for each generic drug reimbursed by both plan types. This was done for each province, from the period of 2003 to 2012. A vertical reference line indicates the introduction of government-mandated price reductions. For illustrative purposes, the results graph showing the change in generic fill rates over time for each province for the drug amiodarone (regular release) is shown in figure 14. Appendix E contains the generic fill rate graphs for all the generic drugs included in this study.

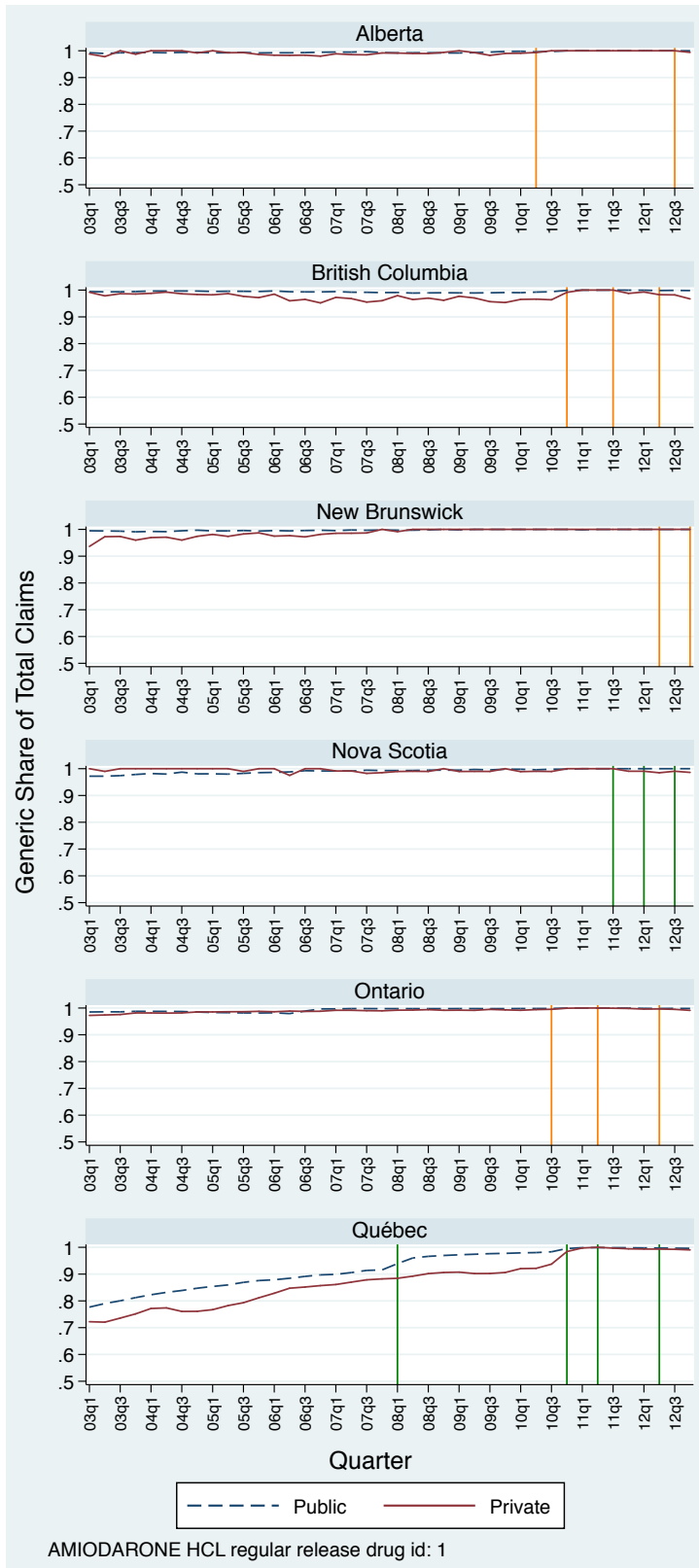


Figure 15 - Amiodarone (Regular Release) Generic Drug Share of Total Claims - by Drug Plan Type, Province (2003-2012)

It is evident from the generic drug fill rate graphs that there was no marked difference between the private plan rates before and after prices were reduced. Generic fill rates were already relatively high before prices were reduced. In fact, generic fill rates in the private plans were comparable to those in the public plans, who have been mandating generic substitution for the entire study period. The generic versions of the anti-diabetic drug metformin, for example, captured a very high share of total drug claims throughout the entire study period. The generic share of total drug claims was around, if not exactly at, 100% from 2003 to 2012 for both plan types. The generic versions of the antibiotics azithromycin and ciprofloxacin entered the market post-2003. Both plan types experienced a very sharp uptake of the generic drugs, almost completely replacing their reference brand drugs in the market. This was observed graphically as both plan's generic share of total claims curves reaching around 100% as soon as the generic drug claims began being reimbursed, plateauing at that level for the rest of the study period.

Even though all generic drugs had high share rates that were unaffected by the price reductions, some drugs presented slightly different fill rate trends than what was generally observed. Amongst those were drugs whose generic version entered the market post-2003, and belonged to the following therapeutic/pharmacological groups: Antiarrhythmics, antihypertensive Angiotensin-converting-enzyme (ACE) inhibitors, diuretic Proton Pump Inhibitors (PPI), the antihyperlipidemic statins, as well as the antiemetic ondansetron and antirheumatic leflunomide. When compared to the uptake curve of the generic antibiotics, the generic drug share graphs for these drugs showed a slightly slower rate of increase in the generic share of total claims curve right before it plateaus. This slow uptake rate was in both plan types, but with varying degrees across the different drug types. Private plans also tended to experience a slower rate of increase than public plans. The PPI generic drugs, for example, displayed slightly slower uptake than the ACE inhibitor generic drugs by the private plans. The generic fill rate of these drugs plateaued at around 100% generic share of total claims for both plan types.

Some generic drugs obtained slightly lower shares of the private drug plans' than the public drug plans' total claims after the plateau rates were reached. This was observed for generic drugs that belonged to the drug classes that target the central nervous system (anticonvulsants, antidepressants, and antipsychotics) as well as the antiviral valacyclovir. These generic drugs experienced a lag in uptake after their listing in the public and private drug plan formularies, and their share of total claims also plateaued at a level slightly less than one (100% generic fill rates)

for private plans. In spite of that, generic fill rates were still substantially high for both plan types, and appear to be unaffected by the reduction in prices.

The change in generic drug fill rates over time for drugs sold in Québec was also observed to be different from the patterns obtained for the other provinces. For both plan types, generic drugs sold in Quebec tended to have a lower share of total claims reimbursed than in other provinces. However, for some generic drugs, the public drug plan generic share experienced a sharp increase in value to a plateau very close to, if not at, 100% generic share towards the end of the study period.

The rate of increase of newly introduced generic drugs' share of total claims over time was also observed to be slower than in the other provinces. In some cases, claims of generic drugs were observed to appear for private drug plans before public drug plans. This was shown in the graphs as the private drug plan share curve increasing to a value greater than zero before the public drug plan share curve does. However, as soon as the generic versions began being reimbursed by the public drug plan, the generic share of total claims curve rose rapidly, reaching a share value higher than that of the private drug plans within the same quarter. An exception to that was observed for the generic drug leflunamide, where even though it appears to have been made available before 2003, Quebec's private drug plans reimbursed a higher share of the generic drug than the public drug plan for the entire study period. Again, in spite of the above-mentioned differences, private drug plan generic fill rates in Quebec appear to have been unaffected by the reduction in prices.

Chapter 4 DISCUSSION

This chapter aims to discuss the meaning and significance of the results presented in the previous chapter. Specifically, this chapter interprets the results for the prices paid for generic drugs by private drug plans before price regulation, during price regulation, as well as the results for the change in generic substitution rates over time throughout the study period.

4 Discussion of Results and Implications

4.1 Have Private Drug Plans Been Able to Obtain Lower Generic Drug Prices Without Governmental Intervention?

In all six provinces, graphical analysis of the change in generic drug prices over time revealed that private drug plans have not been able to independently negotiate lower prices. Generic drug prices paid by private drug plans did not decline until the government intervened. This outcome was consistent for all 31 generic drugs, irrespective of the drug therapeutic class or the province at which each generic drug was sold. In Ontario, private plans were paying prices about 27% above public plan prices until the government regulated private plan prices. Even in Nova Scotia and Quebec, where the provincial government did not directly regulate the prices charged to private drug plans, private plan prices decreased only after the government stepped in and reduced prices for all.¹⁵⁷

Analysis of the post-regulation price reductions provided stronger evidence that private drug plans were unable to obtain lower generic drug prices unless the provincial government intervened. When regulations applied to the private plan prices only, the percentage decrease in private drug plan prices matched the expected decrease according to regulations. When the discounts applied to both plan types, private plan prices decreased by the same rates as the public drug plan prices in all provinces except Quebec. Quebec's private plan prescription spending data, however, including the amount paid in dispensing fees in addition to the generic drug price

¹⁵⁷ Institut National d'Excellence en Sante et en Services Sociaux, "Price Policy"; Nova Scotia Department of Health and Wellness, "Fair Drug Pricing Act To Become Law On July 1."

and markup. We adjusted the public plan prices by adding dispensing fee estimates, and the resulting average unit price plot revealed that both plan type prices decreased by the same rates.

Private plans in Quebec have been reported to pay substantially higher overall prices than the public plan. This difference in price was attributed to pharmacies increasing the private plans' dispensing fee (which is unregulated) to compensate for revenue lost due to the reduction in generic drug prices.¹⁵⁸ Our results, however, indicate otherwise. For most of the study period, results showed that Quebec's private plan prices were well within the estimated public plan average unit price range (including dispensing fee). It should be noted, however, that our dispensing fee estimates were calculated using only the basic RAMQ rates (since we did not know specific prescription type and volume details), and so, perhaps the amount paid in the form of dispensing fee by the public plan has been overestimated in our analysis. In other words, it is possible that pharmacies have indeed been charging private plans higher prices, by increasing the dispensing fee, but we could not assess this accurately using our data. Indeed, a *le soleil* news article published on June 19th, 2013 reports that private plans have not benefited from the price regulations because pharmacies have counteracted the effect by increasing their dispensing fees by about 15% from 2010 to 2012.¹⁵⁹

The only time when prices did not decrease according to regulations was encountered in Alberta during the April 2010 policy reform. We do know, however, that the payment of a compensatory transition allowance was also initiated at that time. For every prescription that cost less than \$75, a transition allowance of \$3 was paid, effective April 1, 2010.¹⁶⁰ This therefore, seems to have offset the effect of the price discounts. The transition allowance was reduced to \$2 in April 2011, and to \$1 in April 2012.¹⁶¹ By July 2012, when the next price policy reform

¹⁵⁸ Couture, "Médicaments Génériques: la Baisse de Prix n'a Jamais eu Lieu"; Association Québécoise des Pharmaciens Propriétaires, "How Is The Price of Prescription Drugs Set?"

¹⁵⁹ Couture, "Médicaments Génériques: la Baisse de Prix n'a Jamais eu Lieu."

¹⁶⁰ Sun Life Assurance Company of Canada, "Highlights of the Legislative and Industry Updates in 2011," *Focus Update*, no. 329 (2012), accessed October 15, 2013, http://www.sunlife.ca/static/canada/Sponsor/About%20Group%20Benefits/Focus%20Update/2012/329/Focus_329.pdf; Alberta Health, "Alberta Pharmaceutical Strategy, Phase Two."

¹⁶¹ Alberta Health, "Alberta Pharmaceutical Strategy, Phase Two."

was implemented, the effect of the transition allowance on total cost was minimal since private plan prices decreased by the same rates set by regulations.¹⁶²

The results presented here corroborate the limited body of evidence that private drug plans are either unable or unwilling to negotiate with pharmacies over generic drug prices.¹⁶³ This is not to say, however, that private plans, or claims adjudicators who work on their behalf, have been completely inactive. There is evidence in the literature that at least one private claims adjudicator – Medavie Blue Cross, an adjudicator active in the Atlantic provinces – attempted unsuccessfully to initiate a competitive tender. The attempt was unsuccessful given the strong resistance from the community pharmacy community.¹⁶⁴ But the same adjudicator successfully petitioned the Nova Scotia provincial government to help lower prices.¹⁶⁵

The results presented here also corroborate the larger body of evidence that documents that private drug plans appear to be unable or unwilling to enact cost management measures more generally.¹⁶⁶ Instead, the recent trend among private plans has been to shift cost to beneficiaries, by increasing copayment and coinsurance levels as well as requiring them to pay the dispensing fee.¹⁶⁷

There is some evidence that private drug plans, as well as claims adjudicators are beginning to enact measures to manage costs. For instance, there are now several consulting firms that help employer-sponsored drug plans choose drugs on the basis of the value that specific drugs offer

¹⁶² Canadian Pharmacists Association, “Generic Drug Pricing - Provincial Policies.”

¹⁶³ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*; Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

¹⁶⁴ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁶⁵ Swedlove, “Re: Recent Fair Drug Pricing Act Announcement.”

¹⁶⁶ Stevenson, *An End to Blank Cheques: Getting More Value Out of Employer Drug Plans (white Paper)*; Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans”; Balaban et al., “Private Expenditures on Brand Name Prescription Drugs After Generic Entry”; Gagnon and Hébert, *The Economic Case for Universal Pharmacare: Costs and Benefits of Publicly Funded Drug Coverage for All Canadians*.

¹⁶⁷ Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

for the money.¹⁶⁸ Medavie Blue Cross, the private drug plan claims adjudicator that operates in the Atlantic provinces, has launched a website that allows its beneficiaries to find pharmacies that offer the lowest prices for particular drugs.¹⁶⁹

4.2 Case Study: Ontario Private Drug Plans

Prices paid by private drug plans in Ontario remained higher than those paid by the public payer until the Ontario government explicitly regulated the private plan reimbursement prices. We investigated this further by estimating the change in the difference between private plan and public plan prices over time, relative to 2003Q1. Indeed, a difference between private and public plan prices existed and remained unchanged until the last quarter of 2006. In October 2006 (2006Q4), the provincial government mandated the price reductions for its public drug plan only.¹⁷⁰ Estimates showed that the difference between prices increased as the public plan prices were reduced and private plan prices remained high. This provides strong evidence that pharmacies did not extend the price discounts to private plan beneficiaries, and that private plans have been unable, or unwilling, to independently obtain the same price discounts as the public plan.

The relative difference between private and public plan prices was greatest during the quarters of 2010Q3, 2010Q4, and 2011Q1. This corresponds to the time when the regulations reduced public plan prices to 25% of the brand drug price. These regulations also reduced private plan prices, but only to 50% of the brand drug price. As regulations continued to reduce the private plan prices over time (to match the prices paid by the public plan), the difference between private plan and public plan was expected to diminish. Indeed, the price difference estimates did decrease from 2011Q2 (when regulations reduced private plan prices to 35%) onwards. By July 2012 (2012Q2) regulations required the prices of generic drugs to be the same for all payers – at 25%

¹⁶⁸ Reformulary Group, “About Us,” last modified 2013, accessed November 12, 2013, http://www.reformulary.com/index_en.php?page=about.

¹⁶⁹ Medavie Blue Cross, “Pointing You in the Right Direction,” last modified 2013, accessed November 1, 2013, <http://www.pharmacyvalue.ca/>.

¹⁷⁰ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

of brand drug price.¹⁷¹ This can be seen in the results estimates obtained for the last 3 quarters of 2012, where the price difference was less than what it was in 2003Q1.

The provincial government intervention has brought substantial savings to Ontario's private drug plans. The price-reducing regulations resulted in a reduction in expenditure on the 31 generic drugs by \$268.4 million over the 2.5-year period. If generic drug prices had remained unregulated, private drug plan expenditure on generic drugs would have been approximately \$693 million over that same time period (compared to the actual \$424.6 million). Therefore, private drug plans benefited from a 40% decrease in expenditure, on average, as a result of generic drug price regulation.

4.3 With the Reduction in Prices, Have Private Drug Plans Taken Steps to Increase Generic Fill Rates?

Analysis of the change in generic fill rates over time revealed that there was no marked difference between the rates obtained before and after prices were reduced. In other words, the rate of generic drug substitution was unaffected by the reduction in prices in all 6 provinces. This may be because the generic fill rates for the private plans in all six provinces were already high beforehand. This suggests that generic drug substitution was already being realized for private plans at the pharmacy level. As a result, there may have been limited potential for additional savings from initiating mandatory substitution controls post-price regulation.

Even though all generic drugs investigated in this study displayed an overall high rate of generic substitution, some generic drugs displayed slightly lower shares of total prescriptions dispensed than others. These drugs mainly belonged to the CNS-targeting antidepressant, anticonvulsant, and antipsychotic drug groups. The slightly lower substitution rates can be attributed to the previously described concern over the safety and effectiveness of generic drugs. Reports of heightened adverse drug reactions as a result of generic drug use, for example, might result in generic drugs losing some market share to brand name drugs.¹⁷² Indeed, worsened cases of depression have been reported as a result of patients having their medication substituted to the

¹⁷¹ Canadian Pharmacists Association, "Generic Drug Pricing - Provincial Policies."

¹⁷² Hassali et al., "Physicians' Views on Generic Medicines: A Narrative Review."

generic version of the antidepressant mirtazapine.¹⁷³ Many of the antiepileptic (anticonvulsant) drugs are also classified as critical dose medications, which are defined as drugs that have a narrow therapeutic index (NTI). Even though NTI drugs have to meet rigorous bioequivalence acceptance criteria, they are still recognized as drugs that should not be substituted as freely as other lower-risk drugs due to the higher risk of adverse drug reactions.¹⁷⁴ The generic version of the anticonvulsant topiramate is associated with longer and more frequent hospitalization periods, as well as a higher risk of head injuries when generic versions of the same drug are substituted.¹⁷⁵ Generic versions of all three therapeutic classes have also been reported to lose their therapeutic effect over time.¹⁷⁶

In addition to the effect that concerns over the safety and bioequivalence might have on generic substitution, efforts made by brand name manufacturers to maintain their market share can also potentially have an added effect on lower generic substitution rates. Following the patent expiry of a brand name drug version, brand name drug manufacturers fight many legal wars to extend their patent protection in order to maintain their labels' market share. The brand name manufacturer of the antiviral valacyclovir, for example, sustained a 4-year long patent infringement battle in order to prevent the generic drug from entering the market.¹⁷⁷ By integrating this with extensive anti-generic entry marketing strategies implemented at the prescribing physician and patient level, brand name manufacturers can successfully prevent generic drugs from completely taking over the market. The cholesterol-lowering statins also have a history of brand name manufacturers battling to maintain market share by introducing new formulations and applying extreme marketing measures, such as those taken by the brand

¹⁷³ C. Correll and M. Carbon, "Branded vs Generic Psychotropic Medication: Is One Better Than the Other?," *Medscape Psychiatry* (2012), <http://www.medscape.com/viewarticle/761370>.

¹⁷⁴ A. Guberman and C. Corman, "Generic Substitution for Brand Name Antiepileptic Drugs: A Survey," *Canadian Journal of Neurological Sciences* 27 (2000): 37–43; Correll and Carbon, "Branded vs Generic Psychotropic Medication: Is One Better Than the Other?"; P. Greenberg, "Does Generic Substitution Always Make Sense?," *Journal of Medical Economics* 11 (2008): 547–553.

¹⁷⁵ Correll and Carbon, "Branded vs Generic Psychotropic Medication: Is One Better Than the Other?"

¹⁷⁶ D. Sloan, "Generic Substitution for Psychotropic Drugs: Questions and Answers," last modified 2009, accessed September 3, 2013, <http://www.cnsspectrums.com/aspx/articledetail.aspx?articleid=2335>.

¹⁷⁷ E. Daly, "Ranbaxy, Glaxo Bury Hatchet Over Valtrex," last modified 2007, accessed September 6, 2013, <http://www.law360.com/articles/30707/ranbaxy-glaxo-bury-hatchet-over-valtrex>.

manufacturer of Lipitor (atorvastatin).¹⁷⁸ Therefore, the observed slightly slower increase in generic share at the time of introduction can also be attributed to the efforts made by brand name manufacturers to oppose generic drug substitution. Consequently, the combined effect of brand name manufacturers' efforts to maintain market share and the concern over the safety of generic drugs can have a negative impact on the rate of generic drug substitution. It has been reported that that was the case with the brand name version of the antidepressant paroxetine, Paxil, and indeed results presented for paroxetine in this study supports that.¹⁷⁹

PPI generic drugs also displayed a slightly slower initial increase in generic fill rates than ACE inhibitors. This result was similar to the results presented in a recent study that investigated generic substitution rates in the Netherlands, attributing the results to similar causes as those mentioned above.¹⁸⁰ A combination of any of the above causes could have also lead to the low generic fill rates observed for the antiarrhythmics as well as the drugs leflunomide, valacyclovir, and ondansetron. Even though antiarrhythmics are not considered critical dose drugs, they were still reported to have higher adverse drug reaction incidence rates than their brand name drug counterparts.¹⁸¹ In 2010, the FDA issued a statement of increased warning over the association between the brand name form of leflunomide, Arava, and liver damage, sparking concern over the safety of the brand name drug.¹⁸² Given the pre-existent apprehension towards the safety of

¹⁷⁸ Catalyst Rx, "Recent Key Generic Launches - A Focus on Zocor," *Rx Watch* (2006), https://www.catalystrx.com/www/shared/docs/pdf/Rx_Updates/RxWatchSummer2006.pdf; S. Findlay, "The Statin Drugs: Prescription and Price Trends," *Consumer Reports* (2007), <http://www.consumerreports.org/health/resources/pdf/best-buy-drugs/Statins-RxTrend-FINAL-Feb2007.pdf>.

¹⁷⁹ P. Pechlivanoglou et al., "Analyzing Generic and Branded Substitution Patterns in the Netherlands Using Prescription Data," *BMC Health Services Research* 11, no. 89 (2011), <http://www.biomedcentral.com/content/pdf/1472-6963-11-89.pdf>; M. Burdon and K. Sloper, "The Art of Using Secondary Patents to Improve Protection," *International Journal of Medical Marketing, Special Issue* 3, no. 3 (2003), http://www.olswang.com/pdfs/secondary_patents_jun03.pdf.

¹⁸⁰ Pechlivanoglou et al., "Analyzing Generic and Branded Substitution Patterns in the Netherlands Using Prescription Data."

¹⁸¹ G. NIu, "Assessment of Therapeutic Equivalence of Original Bisoprolol and Its Generics in Patients with Ischemic Heart Disease with Concomitant Chronic Obstructive Pulmonary Disease," *Kardiologia* 52, no. 3 (2012): 10–4; Consumer Reports, *Using Beta-Blockers to Treat: High Blood Pressure and Heart Disease*, 2011, <http://www.consumerreports.org/health/resources/pdf/best-buy-drugs/CU-Betablockers-FIN060109.pdf>.

¹⁸² US Food and Drug Administration, "FDA Drug Safety Communication: New Boxed Warning for Severe Liver Injury with Arthritis Drug Arava (leflunomide)," last modified 2010, accessed September 12, 2013, <http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm218679.htm>; T. Lamb, "Rheumatoid Arthritis Drug Arava Gets Increased Warning For Liver Injury In July 2010," last modified

generic drugs, it seems plausible that the generic substitution rates would be considerably affected as a result of the original brand name drug safety warning. As for the generic drug valacyclovir, issues with supply have been reported to occur, which might have contributed to the low fill rates in addition to the previously mentioned efforts made by brand name manufacturers to maintain their market share.¹⁸³

In Quebec, generic drug fill rates were observed to be lower than in other provinces for both plan types. This can be attributed to Quebec's "BAP-15" policy that allows the reimbursement of the brand name drug for 15 years after being listed in the provincial formulary, even if an equivalent generic drug is available on the market.¹⁸⁴ Until recently, drug plan claims adjudicators also appear to have followed that rule even though not required by law.¹⁸⁵ This would naturally cause a substantially lower proportion of generic drugs being filled by Quebec's drug plan beneficiaries than those belonging to other drug plan types, such as other provincial plans that limit reimbursement to the lowest-cost alternative.¹⁸⁶ Indeed, our results clearly showed that both public and private drug plans in Quebec had lower generic substitution rates than the other 5 provinces.

Results for the generic drug leflunomide, in fact, showed lower generic drug fill rates for Quebec's public drug plan than its private drug plans throughout the study period, suggesting that the 15-year rule term for the brand name drug was not completed yet. Consequently, any sudden increases observed in any of the other generic drugs' substitution rates could also be attributed to the end of the 15-years, where the drug plan is no longer required to reimburse the

2010, accessed September 5, 2013, <http://www.drug-injury.com/druginjurycom/2010/07/arava-fda-medwatch-alert-july-2010-black-box-warning-severe-liver-injury-arthritis-drug-leflunomide.html>.

¹⁸³ D. Hoey, "Ranbaxy Cuts Off Patients, Independent Pharmacies from Key Drug," *The Voice of the Community Pharmacist*, 2010, <http://ncpanet.wordpress.com/2010/02/03/ranbaxy-cuts-off-patients-independent-pharmacies-from-key-drug/>.

¹⁸⁴ Canadian Generic Pharmaceutical Association, "Quebec Budget Announces Elimination of '15-Year Rule,'" last modified 2012, accessed September 5, 2013, <http://www.canadiangenerics.ca/en/news/docs/eliminationof15-yearrule.pdf>; ClaimSecure, "To Our Clients in Quebec or Who Have Quebec Members... A Savings Opportunity Through the ClaimSecure BAP 15 Formulary," *ClaimSecure eNews* (2012), accessed September 4, 2013, <http://www.claimsecure.com/en-CA/content/pdfs/en-CA/eNewsBulletins/eNewsBAP15.pdf>.

¹⁸⁵ L. Taylor, "Quebec Ends 15-Year Reimbursement for Branded Drugs," *PharmaTimes Online*, 2012, http://www.pharmatimes.com/article/12-11-29/Quebec_ends_15-year_reimbursement_for_branded_drugs.aspx.

¹⁸⁶ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

brand name drug price. That is, as reimbursement becomes limited to the lowest-cost alternative available, more brand name drugs become substituted by generic drugs and the generic fill rate increases accordingly.

In some of the cases where the generic drug was introduced during the study period in Quebec, private drug plans were observed to experience an earlier initial uptake of generic drugs than the public drug plan. Since a generic drug is only allowed on the market once the provincial government approves interchangeability, it is expected that both plan types would reimburse the generic drug at the same time.¹⁸⁷ It is unclear why private plans would begin reimbursing the generic drug before the public plan. In any case, the focus of our analysis was to assess whether the generic share rates increased with the reduction in prices. Similar to the rest of the drug examined; the private plan generic share rates of these drugs were also unaffected by the price reductions and were already high beforehand.

In spite of the slight variations in generic substitution rate trends across the different drug classes, generic substitution rates were considerably high for all generic drugs. Private plan substitution rates were comparable to those of the public drug plans, and appear to have been unaffected by the reduction in prices.

There are a number of stakeholders that could have affected the pre-regulation rate of generic substitution in private plans. These include the private plan sponsors, drug claims adjudicators, physicians, patients, and pharmacists.

Even before the price regulation era, generic drugs cost less than their equivalent brand name drug.¹⁸⁸ This suggests that employers might have already been motivated to mandate generic substitution in an attempt to manage drug costs. However, as discussed in the introduction chapter, it has already been established that employers are not particularly keen on implementing this policy in their plans for several reasons.¹⁸⁹ Therefore, it is unlikely that private drug plans have been mandating generic substitution during the time when prices were not yet reduced by

¹⁸⁷ Competition Bureau, *Canadian Generic Drug Sector Study*.

¹⁸⁸ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*.

¹⁸⁹ Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

regulations. Drug plan claims adjudicators, especially those that manage ASO plans, would also not be particularly motivated to mandate substitution. This is because their income is proportional to total drug cost, and therefore, it is in their financial interest that costs continue to grow. As a result, mandating generic substitution would not be in their favor since, for the same volume of drugs reimbursed, total cost would be a lot less if generic drugs were dispensed instead of the more expensive brand drugs.¹⁹⁰ It is also unlikely that either the patient or physician is the main driver behind generic substitution. This can be mainly attributed to the general concern that generic drugs may sometimes not be as effective as the original brand name drug.¹⁹¹ Therefore, when given the choice, it seems more likely that the brand drug would be preferred over the generic drug. This is particularly the case when the plan beneficiary is not restricted financially to the cost of the generic drug (as is the case with “open access” private drug plans).

One of the main and most influential stakeholders with regards to generic substitution is the pharmacist. Pharmacists are different from the above-mentioned stakeholders in that they have the predisposed incentive to dispense generic drugs by virtue of rebate payments. Pharmacists receive rebates from generic drug manufacturers in exchange for dispensing their generic drugs. Rebate income is proportional to the volume of generic drugs sold. Pharmacists also generally do not receive rebates from brand drug manufacturers. Therefore, generic drug manufacturers have the unique advantage in financially motivating pharmacists to substitute prescriptions with generic drugs whenever it is legally permitted according to the interchangeability regulations.¹⁹²

In provinces where rebates are banned, pharmacies have been reported to reap ‘rebate’ benefits in other ways. Pharmacies that own their own generic drug label receive ‘rebate’ income by dispensing their own drug instead of the brand name drug or the competitors’ generic drugs. In that way, all the revenue that could be gained from selling the generic drug, including rebates, is

¹⁹⁰ Ibid.

¹⁹¹ H. Hakonsen and E. L. Toverud, “A Review of Patient Perspectives on Generics Substitution: What Are the Challenges for Optimal Drug Use,” *Generics and Biosimilars Initiative Journal* 1, no. 1 (2012), <http://gabi-journal.net/wp-content/uploads/GaBIJ-2012-1-p28-32-ReviewArticle-HÃfÃ¥konsen.pdf>; P. Dylst et al., “Generic Medicines: Solutions for a Sustainable Drug Market?,” *Applied Health Economics and Health Policy* 11, no. 5 (2013): 437–443; Hassali et al., “Physicians’ Views on Generic Medicines: A Narrative Review.”

¹⁹² Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*; Competition Bureau, *Canadian Generic Drug Sector Study*.

directly retained by the pharmacy.¹⁹³ Furthermore, in spite of rebates being banned, they are still very difficult to monitor. This is especially the case with chain pharmacies that operate in several provinces across the country, some of which do not ban rebate income for community pharmacies.¹⁹⁴

In all cases, the motivation to dispense generic drugs clearly exists for pharmacists by virtue of the incentive created by rebate income. Therefore, out of all the stakeholders, it seems that pharmacists are the main drivers behind the high generic substitution rates observed throughout the study period. In fact, it has been well established in the literature that the payment of rebates is a main driver behind generic substitution at the pharmacy level.¹⁹⁵

Given the increasingly aggressive provincial legislation targeted towards the elimination of rebates and the phasing-out of professional allowances, it might become more challenging for pharmacists to sustain the same level of motivation to dispense generic drugs as they did in the past. This is because the current reimbursement system bases pharmacy fee payments on their total drug costs. As prices decrease and rebates are banned, a resulting diminishing return from dispensing generic drugs might lead pharmacies to revert back to dispensing the more expensive brand name drugs.¹⁹⁶ An example of the role that rebate prohibition can play in affecting generic substitution rates can be observed in Quebec, where brand name drugs were observed to obtain a substantially higher share of total prescriptions dispensed compared to other provinces.

Consequently, the findings of this study suggest, or provide further support for the concept, that rebate payments might not be ‘all bad’ and that banning rebates might result in some damages – at least from the generic substitution standpoint. This seems particularly the case for private drug plans that do not enforce mandatory generic substitution policies; A lack of motivation to dispense generic drugs at the pharmacy level might result in a reduction in generic fill rates, a shift back to dispensing brand name drugs, and potentially higher drug costs being incurred in

¹⁹³ Moscu, “What’s In A Name? Ontario Pharmacies Fight To Substitute Brand-Name Drugs With Private-Label Equivalents”; O’Kane, “Supreme Court to Hear Appeal of Ontario Generic Drug Rules.”

¹⁹⁴ Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*.

¹⁹⁵ Ibid.

¹⁹⁶ Ibid.; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

the future. Therefore, if the current reimbursement system remains as it is, it might become necessary to counteract the impact of rebates/professional allowances elimination in order to keep pharmacies motivated to continue substituting generic drugs.¹⁹⁷

¹⁹⁷ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

Chapter 5 CONCLUSION

5 Concluding Remarks

5.1 Summary of Research Significance and Key Findings

Public drug plans, with their large purchasing power, have been implementing many strategies to cut down costs such as reducing the amount that they are willing to pay for generic drugs, and limiting reimbursement to the lowest cost alternative, hence mandating generic drug substitution.¹⁹⁸ Private sources contribute to a substantial amount (54.5%) of prescription drug costs.¹⁹⁹ Provincial governments, however, have generally left the management of private drug plans to the discretion of the employers and their private insurance companies. It is up to the drug plan sponsor, for example, to decide whether to include mandatory generic substitution policies in the plan design or not.²⁰⁰ Until recently, prices of generic drugs sold to private drug plans have also not been regulated.²⁰¹

As a result of a combination of rising drug costs, a weak economy, and public plans restricting their scope of coverage; the private drug plan market is confronting a substantial amount of pressure. Consequently, private plan sponsors have introduced “cost-shifting” policies. These policies require plan beneficiaries to assume more of the drug cost.²⁰² It is unclear if these policies represent a shift towards more active management of drug plan costs.

In this paper, we provided further evidence on the willingness and ability of private drug plans to manage costs. In particular, we focused on the prices that the private plans pay for generic

¹⁹⁸ Bell et al., *Generic Drug Pricing and Access in Canada: What Are the Implications?*; Competition Bureau, *Canadian Generic Drug Sector Study*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

¹⁹⁹ Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012*.

²⁰⁰ Balaban et al., “Private Expenditures on Brand Name Prescription Drugs After Generic Entry”; Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

²⁰¹ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

²⁰² Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans.”

drugs. There are reports that at least one attempt was unsuccessful due to pharmacies' opposition to these moves.²⁰³ The intervention of the provincial government to regulate the private sector generic drug prices also suggests that private plans have not been able to negotiate lower prices. However, to date, it is unclear to what extent private drug plans have been able to independently lower prices prior to governmental intervention.

We are not the first to address this issue. However, previous studies only examined the prices of the top 10 selling generic drugs and examined the prices only partway through the reform period.²⁰⁴ By examining the prices paid for a wide range of generic drugs over a longer period of time in all six provinces, we provided solid empirical evidence on the matter. Our analysis indicates that private drug plans were not successful in obtaining lower generic drug prices on their own; regardless of how low the prices decreased for their public drug plan counterparts.

Generic drug reimbursement prices did eventually decrease for private plans, but only after the provincial government stepped in and mandated that pharmacies reduce prices. Of note is the case of Nova Scotia, where the CLHIA petitioned the Nova Scotia government to negotiate lower prices for all.²⁰⁵ Therefore, even though the private sector showed an interest in lowering prices and 'initiated' the attempt, discounts were only obtained when the government intervened and negotiated the reductions.²⁰⁶

The purpose of the government-mandated generic drug price discounts was to give private plans the opportunity to benefit from the same cost-saving opportunity as the public plans. The potential savings made due to the price reductions was further investigated by estimating the difference between actual cost for private drug plans in Ontario and the expected cost had prices remained unregulated. Had prices continued to be unregulated, private drug plans would have spent about \$693 million for the entire regulated period. In other words, the price discounts obtained due to regulation saved private drug plans an estimated \$268.4 million for the same number of units sold during the 10 quarters of price regulation studied.

²⁰³ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

²⁰⁴ Ibid.; Hollis, *Generic Drug Pricing and Procurement: A Policy for Alberta*.

²⁰⁵ Swedlove, "Re: Recent Fair Drug Pricing Act Announcement."

²⁰⁶ Nova Scotia Department of Health and Wellness, "Fair Drug Prices Now a Reality for Nova Scotians."

Another important aspect of drug cost management is the implementation of mandatory generic substitution policies. Given the recent government-sanctioned reduction in prices, it is important to assess whether private drug plans have taken advantage of these discounts by limiting reimbursement to the lower-cost generic drugs. Interestingly enough, results showed that generic fill rates were already high, before the price discounts, and there was no marked difference between the fill rates before and after price regulation. In fact, rates were very close to, if not the same as, those observed for the public drug plans. Thus there may have been limited potential for additional savings to be made from introducing mandatory substitution policies.

It has been well established in the literature that the payment of rebates is a main driver behind generic substitution at the pharmacy level.²⁰⁷ Therefore, these high pre-policy rates can be attributed to the preexisting incentive of rebate payment that pharmacies have to dispense generic drugs.

Given the recent provincial regulations targeted towards the elimination of this incentive (rebate payment), the return from dispensing generic drugs may no longer be comparable to the return from their brand name counterparts. As a result, pharmacists might become less inclined to maintain the same level of generic substitution as they did before.²⁰⁸ In other words, when given the choice to dispense either drug type, pharmacies might revert back to dispensing the more expensive brand drugs. This could possibly result in severe consequences on private plan costs, particularly for those that are “open access” and do not limit reimbursement to the cost of generic drugs. Consequently, the findings from this study support what has been argued in other studies; that the elimination of rebates might have a negative impact on the substitution of generic drugs and the overall provision of pharmacy services.²⁰⁹ To ensure that pharmacists continue dispensing generic drugs, the impact of rebate elimination needs to be counteracted by other means that will sustain incentives.²¹⁰

²⁰⁷ Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*.

²⁰⁸ Ibid.; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

²⁰⁹ Grootendorst, Rocchi, and Segal, *An Economic Analysis of the Impact of Reductions in Generic Drug Rebates on Community Pharmacy in Canada*; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

²¹⁰ Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

5.2 Limitations and Further Research

One of the limitations encountered in this study was that the spending data available for Quebec's private plans included the amount spent on the dispensing fee in addition to the generic drug price and mark up. Therefore, the exact magnitude of the price discounts obtained by the private plans could not be determined. However, this limitation did not hinder our ability to address the study research objective: to assess whether private plans have been able to independently obtain lower generic drug prices.

We were also unable to identify the reason behind some discrepancies in the generic share rates of some of the generic drugs. For example, we were unable to determine why private drug plans began reimbursing some drug before the public drug plan in Quebec. However, the private plan generic substitution rates were still high for these drugs before the price reductions, and unaffected by the discounts, which answers the question that our research intended to address.

One major limitation was that we were unable to gather adequate information from the literature on specific incidents or attempts made by the private sector to either negotiate with pharmacies or lobby the government to lower prices. We are aware that attempts have been made, but this information is not publicly available. The only two publicized attempts were the Medavie Blue Cross clarithromycin tender and the CLHIA petition to the Nova Scotia government.²¹¹ Further qualitative research can be conducted with key industry informants to investigate the extent to which private plans strived to lower prices and to identify the reasons behind their lack of success. This will also provide a better understanding of the strengths and weaknesses of private plans with respect to their ability to manage costs.

Results of this study have indicated that even though many private plans have not been enforcing generic substitution policies, they were still able to obtain high generic fill rates as a result of rebate payment. As more action is taken towards eliminating rebates, pharmacies might lack the incentive to continue dispensing generic drugs.²¹² Combined with the recently intensified efforts by brand name manufacturers to gain back market share, generic substitution rates for private

²¹¹ Swedlove, "Re: Recent Fair Drug Pricing Act Announcement"; Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

²¹² Competition Bureau, *Benefiting from Generic Drug Competition in Canada: The Way Forward*.

plans that do not enforce this policy might be significantly reduced in the future.²¹³ These lowered rates might have a significant impact on total prescription drug spending for private drug plans. Consequently, future studies need to be conducted on the impact of rebate elimination; both on the rate of generic drug substitution, as well as on prescription drug expenditure (generic drug vs. brand drug) for private drug plan in Canada.

Overall, while this study has provided some basis for greater understanding of drugs cost management in private plans, future research is needed to bring together a better understanding of the willingness and ability of private plans to manage costs. Results from this study revealed that private drug plans did not have much influence on the management of their drug costs. They lacked the purchasing power to independently negotiate lower prices and their generic substitution rates seems to have been more strongly influenced by pharmacists rather than the implementation of mandatory substitution policies. With the increasing pressures to contain costs, private plans are now under substantial pressures to better manage costs than ever before.²¹⁴ In order to do that, further research is first needed to more comprehensively assess the strengths and weaknesses of private plans in drug cost management.

²¹³ F. J. Poirier, “Manufacturers Offer to Reimburse,” *Benefits and Pension Monitor* (2013), http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&ved=0CDEQFjAB&url=http%3A%2F%2Fwww.mercer.ca%2Fattachment.dyn%3Bjsessionid%3DtR90pYBz01mPSr1dUXglAA**.merc04%3FidContent%3D1522815%26filePath%3D%252Fattachements%252FEnglish%252F Mercer%2B-%2BDrug%2BManufacturers%2BOffer%2Bto%2BReimburse.pdf%26fileType%3DDDB%26siteLanguage%3D1007&ei=IbaOUoKyMMHYrgGrkYHoCA&usg=AFQjCNGVWbOmIhvJGesVxPAU8HK_724RA&sig2=GxfbTRIMNFqVJy7YbnTw3Q&bvm=bv.56988011,d.aWM.

²¹⁴ Kratzer et al., “Cost-Control Mechanisms in Canadian Private Drug Plans”; Stevenson, *An End to Blank Cheques: Getting More Value Out of Employer Drug Plans (white Paper)*.

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Appendices

Appendix A - Properties of Sample Generic Drugs

Drug (Chemical-Form)	Brand Manufacturer	Generic Manufacturer	Pharmacological Category
Amiodarone HCL regular release	Pfizer	Apotex Inc. Dominion Pharmacal Mylan Pharma Pharmascience Pro Doc Riva Sandoz Canada Inc Sanis Health Inc. Sivem Pharma Inc. Sorres Pharma Inc. Teva Canada Ltd.	Antiarrhythmic Agent, Class III
Atenolol regular release	AstraZeneca Baker Cummins	Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Marcan Pharma Inc. Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma Nu-Pharm Inc. Pharmascience Prempharm Pro Doc Ranbaxy Pharma Can. Riva Sandoz Canada Inc. Schein Pharma CDA Septa Pharma Septa Pharmaceuticals Inc. Sivem Pharma ULC Taro Pharmaceuticals Teva Canada Ltd.	Antianginal Agent; Beta-Blocker, Beta-1 Selective

Azithromycin regular release	Pfizer	Apotex Inc Cobalt Pharma Dominion Pharmacal Genmed Mylan Pharma Pharmascience Pharmel Pro Doc Riva Sandoz Canada Inc. Sanis Health Inc. Teva Canada Ltd.	Antibiotic, Macrolide
Bisoprolol Fumarate regular release	Valeant Pharma	Apotex Inc. Mylan Pharma Pharmascience Pro Doc Sandoz Canada Inc. Sivem Pharma ULC Sorres Pharma Inc. Teva Canada Ltd.	Antiarrhythmic Agent, Beta-Blocker, Beta-1 Selective
Carbamazepine extended release	Novartis Pharma	Apotex Inc. Dominion Pharmacal Mylan Pharma Pharmascience Pharmel Pro Doc Sandoz Canada Inc. Taro Pharmaceuticals	Anticonvulsant
Carvedilol regular release	GlaxoSmithKline	Apotex Inc. Dominion Pharmacal Jamp Pharma Meliapharm Inc. Mylan Pharma Pharmascience Pro Doc Ranbaxy Pharma Can Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd.	Antiarrhythmic Agent, Beta-Blocker with Alpha-blocking activity

Ciprofloxacin regular release	Bayer Healthcare	Apotex Inc. Auro Pharma Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Manda Pharma Inc. Marcan Pharma Inc. Mint Pharmaceuticals Mylan Pharma Pharmascience Pharmel Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Septa Pharma Sivem Pharma ULC Taro Pharmaceuticals Teva Canada Ltd.	Antibiotic, Fluoroquinolone
Citalopram HBR regular release	Lundbeck Canada Inc. Sunovion Pharma Inc.	Apotex Inc. Auro Pharma Inc. Cobalt Pharma Dominion Pharmacal International Pharmaceutical Generics Ltd. Jamp Pharma Manda Pharma Inc. Marcan Pharma Inc. Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma Next Generation Nu-Pharm Inc. Odan Lab Pharmascience Pharmel Pro Doc QD Pharma Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Septa Pharma Sivem Pharma ULC Teva Canada Ltd.	Antidepressant, Selective Serotonin Reuptake Inhibitor
Clonazepam regular release	Roche Valeant Pharma	Apotex Inc. Cobalt Pharma Dominion Pharmacal Meliapharm Inc. Mylan Pharma	Anticonvulsant, Benzodiazepine

		Nu-Pharm Inc. Pharmascience Pharmel Pro Doc Riva Sandoz Canada Inc. Teva Canada Ltd. Zymcan Pharma	
Divalproex delayed release	Abbott EPD	Apotex Inc. Mylan Pharma Nu-Pharm Inc. Pharmascience Pro Doc Teva Canada Ltd.	Anticonvulsant, Histone Deacetylase Inhibitor
Fluoxetine regular release	Lilly Sunovion Pharma Inc.	Accord Healthcare Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma Nu-Pharm Inc. Pentapharm Pharmascience Pharmel Pro Doc Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd.	Antidepressant, Selective Serotonin Reuptake Inhibitor
Fosinopril regular release	BMS pharma	Apotex Inc. Jamp Pharma Linson Pharma Inc. Mylan Pharma Pharmascience Pro Doc Ranbaxy Pharma Can Ratiopharm Riva Teva Canada Ltd.	Hypotensive; Angiotensin- Converting Enzyme (ACE) Inhibitor
Gabapentin regular release	Pfizer	Apotex Inc. Auro Pharma Inc. Cobalt Pharma Dominion Pharmacel Genmed Jamp Pharma Mylan Pharma Pharmascience Pharmel Pro Doc Ranbaxy Pharma Can	Anticonvulsant; GABA Analog

		Riva Sanis Health Inc. Sivem Pharma UCL Sorres Pharma Inc. Teva Canada Ltd.	
Lamotrigine regular release	GlaxoSmithKline	Apotex Inc. Auro Pharma Inc. Mylan Pharma Pharmascience Pro Doc Sanis Health Inc. Teva Canada Ltd.	Anticonvulsant
Leflunomide regular release	Sanofi-Aventis	Apotex Inc. Mylan Pharma Pharmascience Sandoz Canada Inc. Sanis Health Inc. Teva Canada Ltd.	Antirheumatic
Lovastatin regular release	Merck Canada Inc.	Apotex Inc. Cobalt Pharma Mylan Pharma Nu-Pharm Inc. Pharmascience Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Teva Canada Ltd.	Antilipemic Agent, HMG-CoA Reductase Inhibitor
Metformin regular release	Baker Cummins Sanofi-Aventis Valeant Pharma	Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Marcan Pharmaceuticals Inc. Mint Pharmaceuticals Mylan Pharma Nu-Pharm Inc. Pharmascience Pharmel Prempharm Pro Doc QD Pharma Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Septa Pharmaceuticals Inc. Sivem Pharma ULC Teva Canada Ltd. Trianon Zymcan Pharma	Antidiabetic Agent, Biguanide

Mirtazapine regular release	Merck Canada Inc.	Apotex Inc. Cobalt Pharma Dominion Pharmacel Jamp Pharma Meliapharm Inc. Mylan Pharma Pharmascience Pro Doc Riva Sandoz Canada Inc. Sanis Health Inc. Teva Canaa Ltd.	Antidepressant, Alpha-2 Antagonist
Ondansetron HCL regular release	GlaxoSmithKline	Apotex Inc. Cobalt Pharma Jamp Pharma Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma Odan Lab Pharmascience Pharmel Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Septa Pharma Teva Canada Ltd.	Antiemetic; Selective 5-HT3 Receptor Antagonist
Pantoprazole delayed release	Takeda Pharma NA	Apotex Inc. Cobalt Pharma Dominion Pharmacal Meliapharm Inc. Mylan Pharma Pharmascience Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sivem Pharma ULC Sorres Pharma Inc. Teva Canada Ltd.	Proton Pump Inhibitor; Substituted Benzimidazole
Paroxetine regular release	GlaxoSmithKline	Apotex Inc. Auro Pharma Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Meliapharm Inc. Mylan Pharma Pharmascience Pro Doc QD Pharma QD Pharmaceuticals ULC Riva Sandoz Canada Inc.	Antidepressant, Selective Serotonin Reuptake Inhibitor

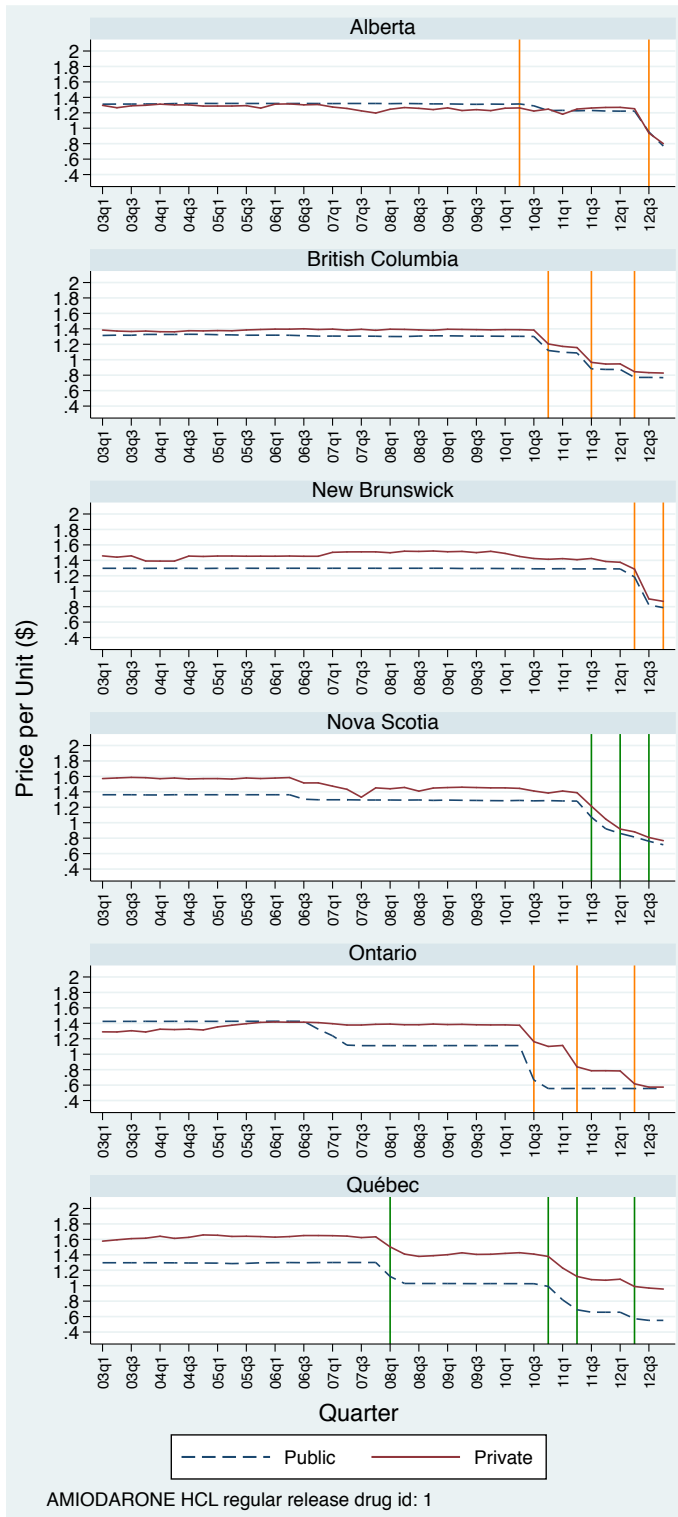
		Sanis Health Inc. Sivem Pharma ULC Sorres Pharma Inc. Teva Canada Ltd.	
Pravastatin regular release	BMS Pharma	Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Linson Pharma Inc. Mint Pharmaceuticals Mylan Pharma Nu-Pharm Inc. Pharmascience Pharmel Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Sorres Pharma Inc. Teva Canada Ltd.	Antilipemic Agent, HMG-CoA Reductase Inhibitor
Rabeprazole Sodium delayed release	Janssen Pharma	Apotex Inc. Dominion Pharmacal Patriot Pharmascience Pro Doc Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Sorres Pharma Inc. Teva Canada Ltd.	Proton Pump Inhibitor; Substituted Benzimidazole
Ramipril regular release	Sanofi-Aventis	Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Mylan Pharma Pharmascience Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd.	Hypotensive; Angiotensin- Converting Enzyme (ACE) Inhibitor
Risperidone regular release	Janssen Pharma	Apotex Inc. Avantra Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma	Antipsychotic Agent, Atypical

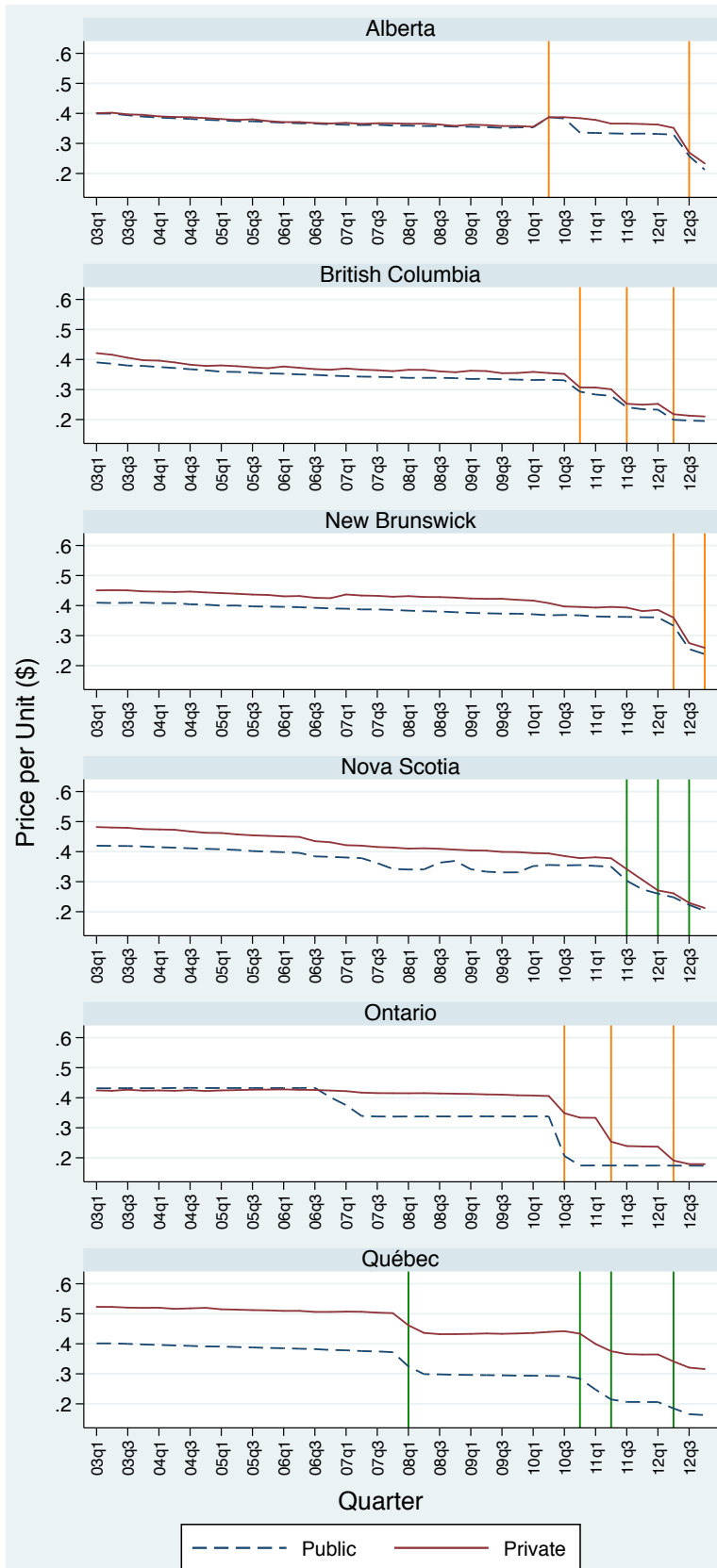
		Pharmascience Pharmel Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Teva Canada Ltd.	
Sertraline regular release	Pfizer	Apotex Inc. Cobalt Pharma Dominion Pharmacal Genmed Jamp Pharma Meliapharm Inc. Mylan Pharma Nu-Pharm Inc. Pharmascience Pro Doc Ranbaxy Pharma Can Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd.	Antidepressant, Selective Serotonin Reuptake Inhibitor
Simvastatin regular release	Merck Canada Inc.	Apotex Inc. Cobalt Pharma Dominion Pharmacal Jamp Pharma Marcan Pharma Inc. Meliapharm Inc. Mint Pharmaceuticals Mylan Pharma Nu-Pharm Inc. Odan Lab Pharmascience Pharmel Prempharm Pro Doc Ranbaxy Pharma Can Ratiopharm Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Taro Pharmaceuticals Teva Canada Ltd. Zymcan Pharma	Antilipemic Agent, HMG-CoA Reductase Inhibitor
Topiramate regular release	Janssen Pharma	Apotex Inc. Auro Pharma Inc. Cobalt Pharma Dominion Pharmacal Genmed Meliapharm Inc. Mint Pharmaceuticals	Anticonvulsant

		Mylan Pharma Pharmascience Pro Doc Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd. Zymcan Pharma	
Valacyclovir HCL regular release	GlaxoSmithKline	Apotex Inc. Cobalt Pharma Dominion Pharmacal Mylan Pharma Pharmascience Pro Doc Riva	Antiviral Agent
Venlafaxine HCL extended release	Pfizer	Apotex Inc. Cobalt Pharma Genmed Mylan Pharma Pharmascience Pro Doc Riva Sandoz Canada Inc. Sanis Health Inc. Sivem Pharma ULC Teva Canada Ltd.	Antidepressant, Serotonin/Norepineph rine Reuptake Inhibitor
Verapamil HCL extended release	Pfizer	Apotex Inc. Dominion Pharmacal Mylan Pharma Nu-Pharm Inc. Pharmascience Pro Doc Riva Sorres Pharma Inc. Teva Canada Ltd.	Antiarrhythmic Agent; Calcium Channel Blocker

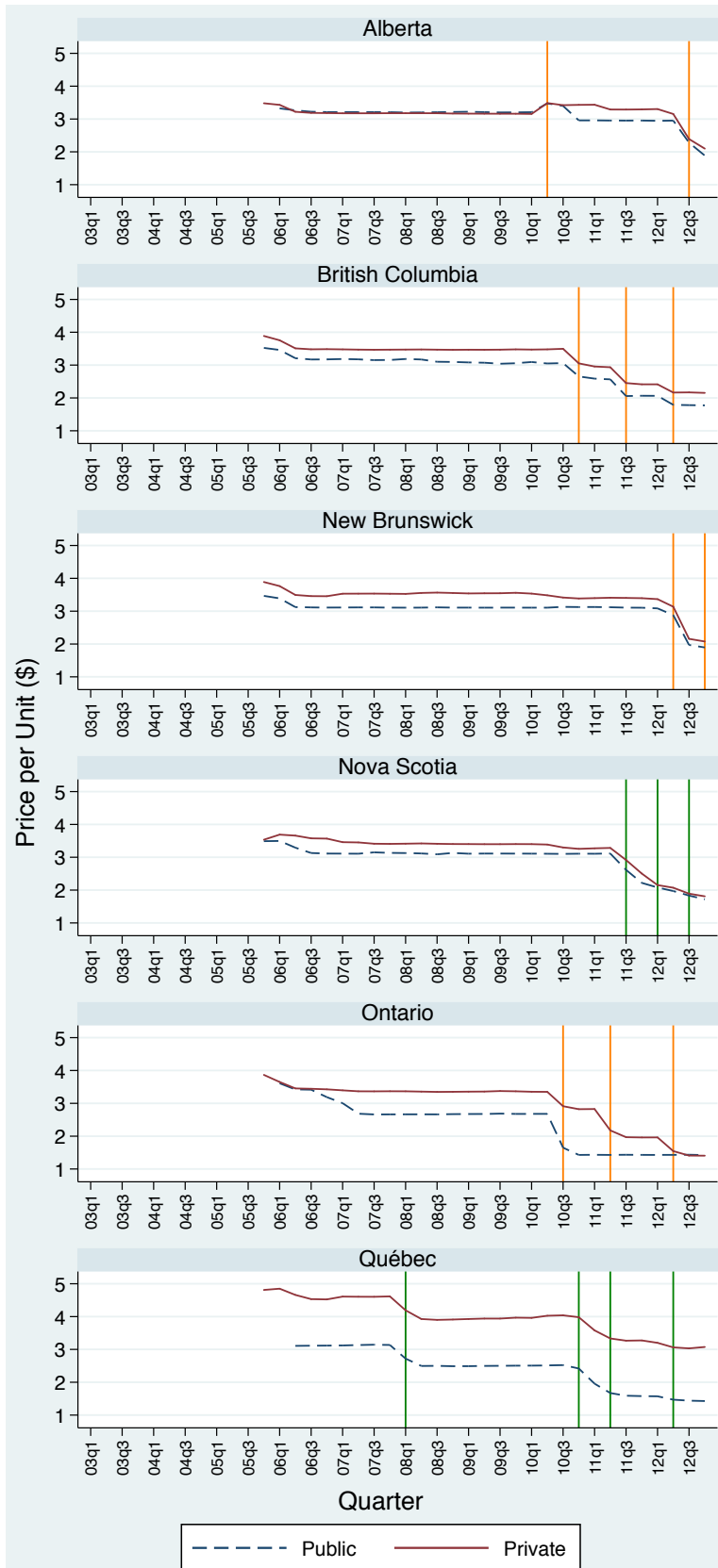
Source: (Lexicomp 2013)

Appendix B - Graphs: Generic Drug Price per Unit, by Plan Type & Province (2003-2012)

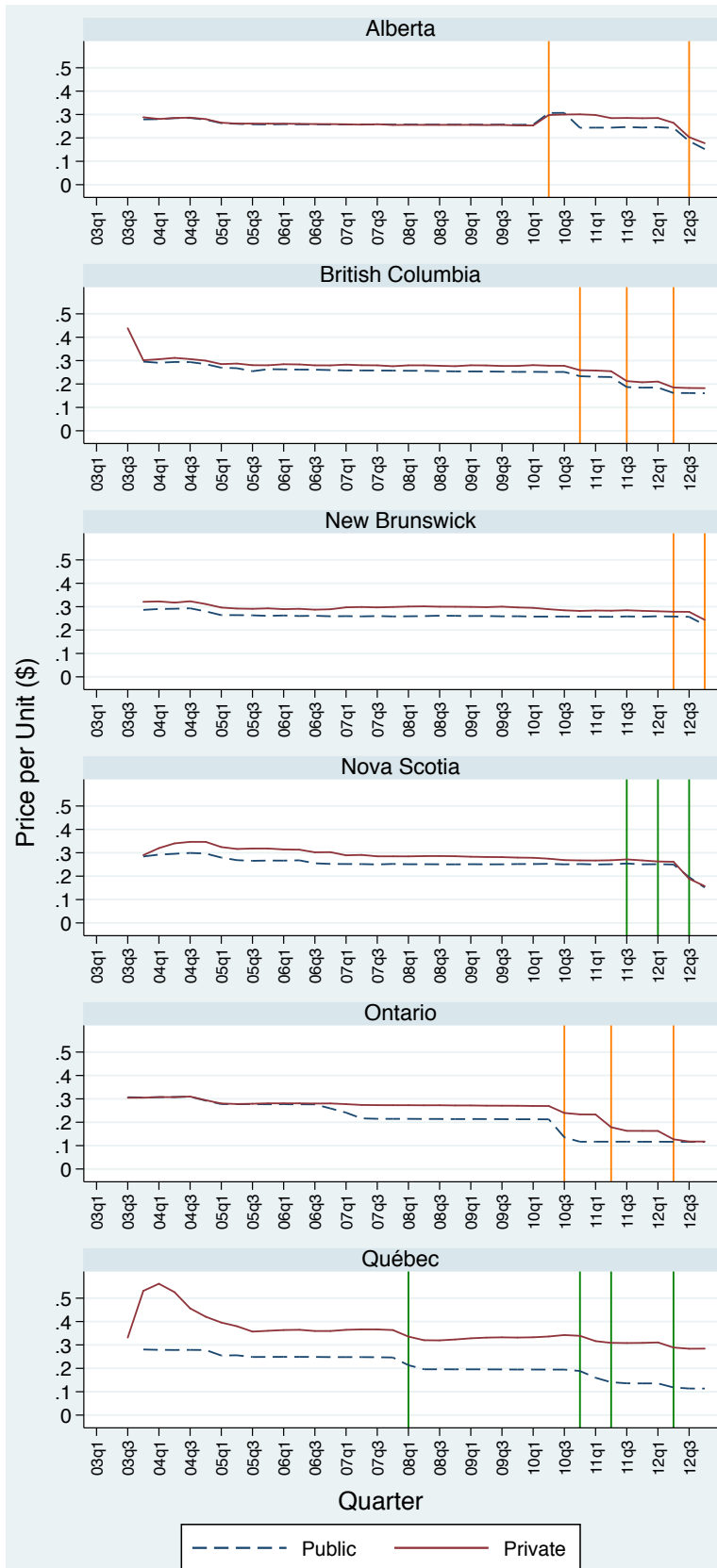




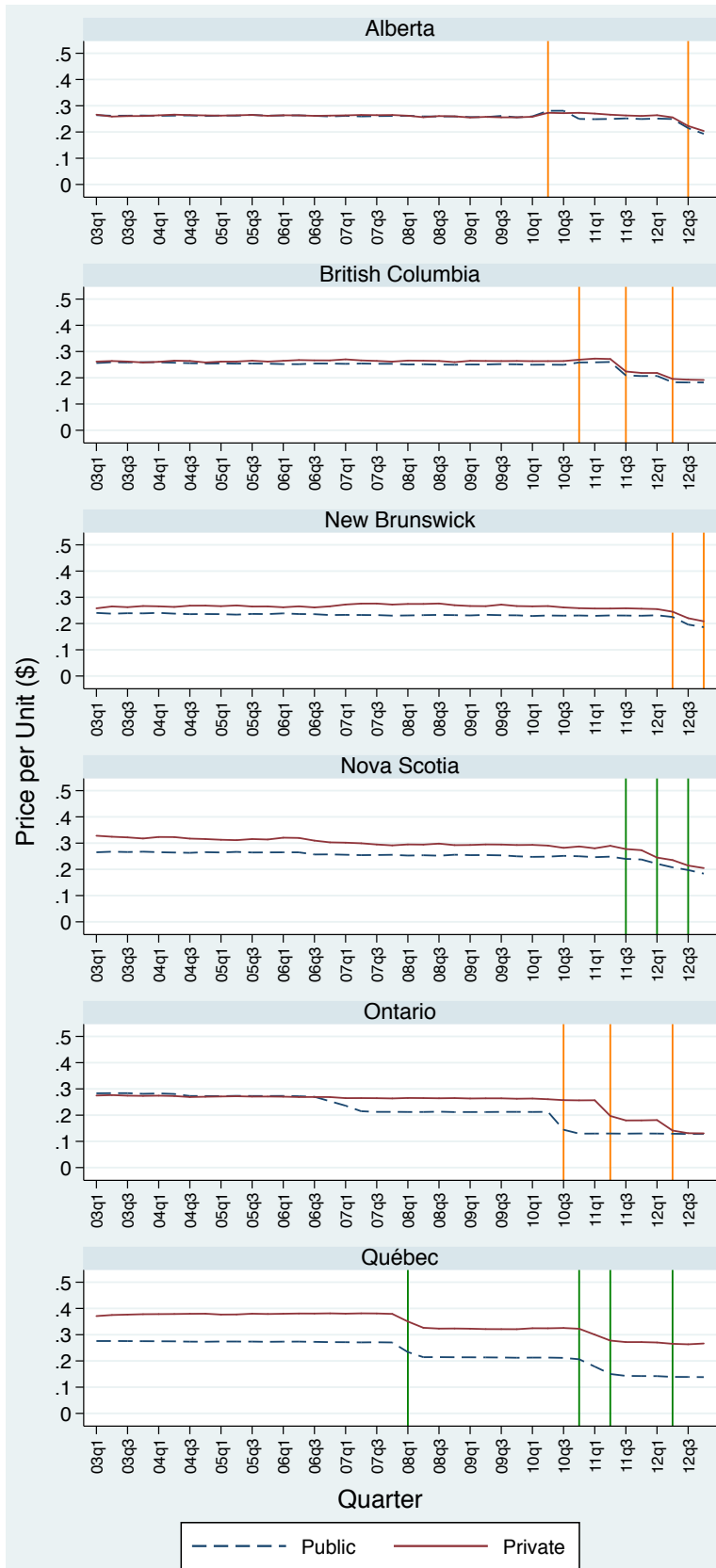
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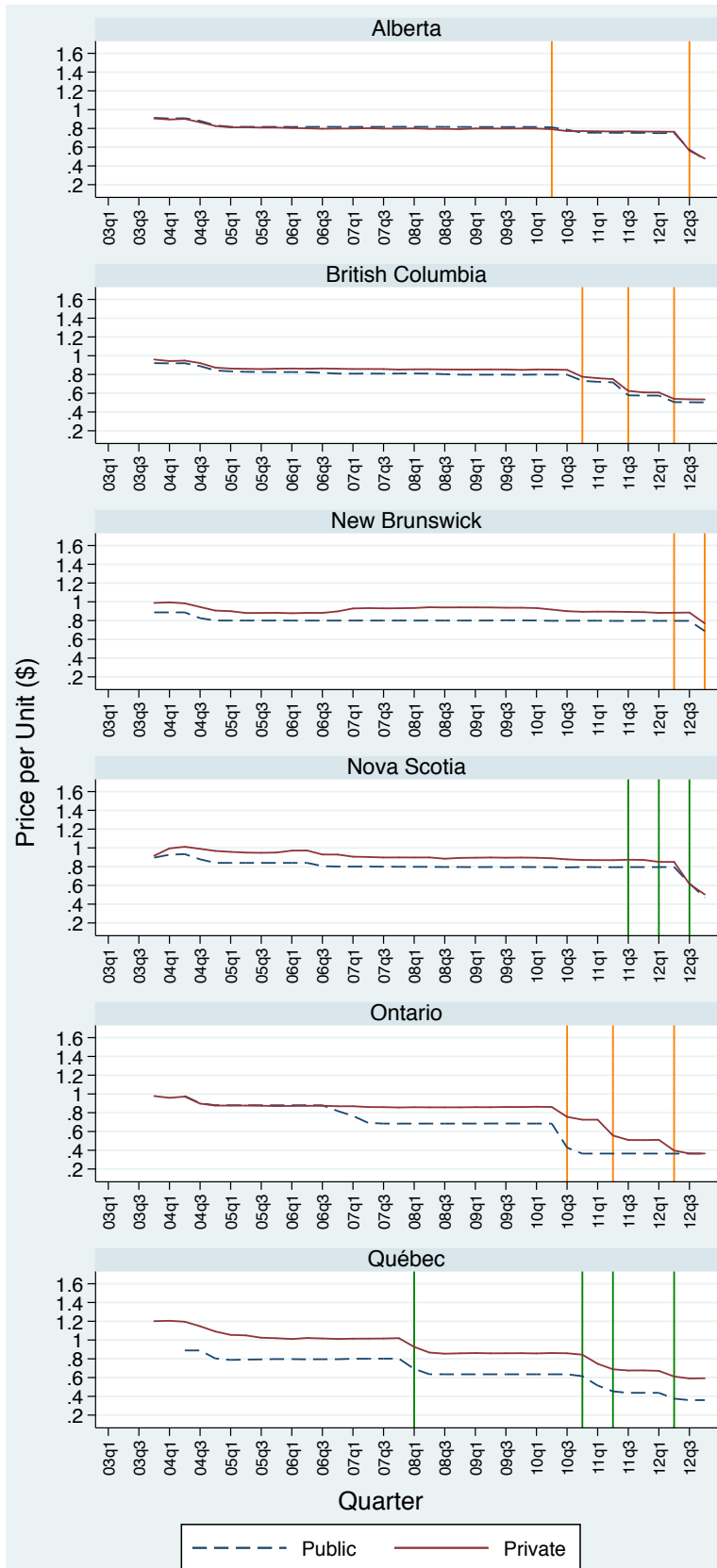
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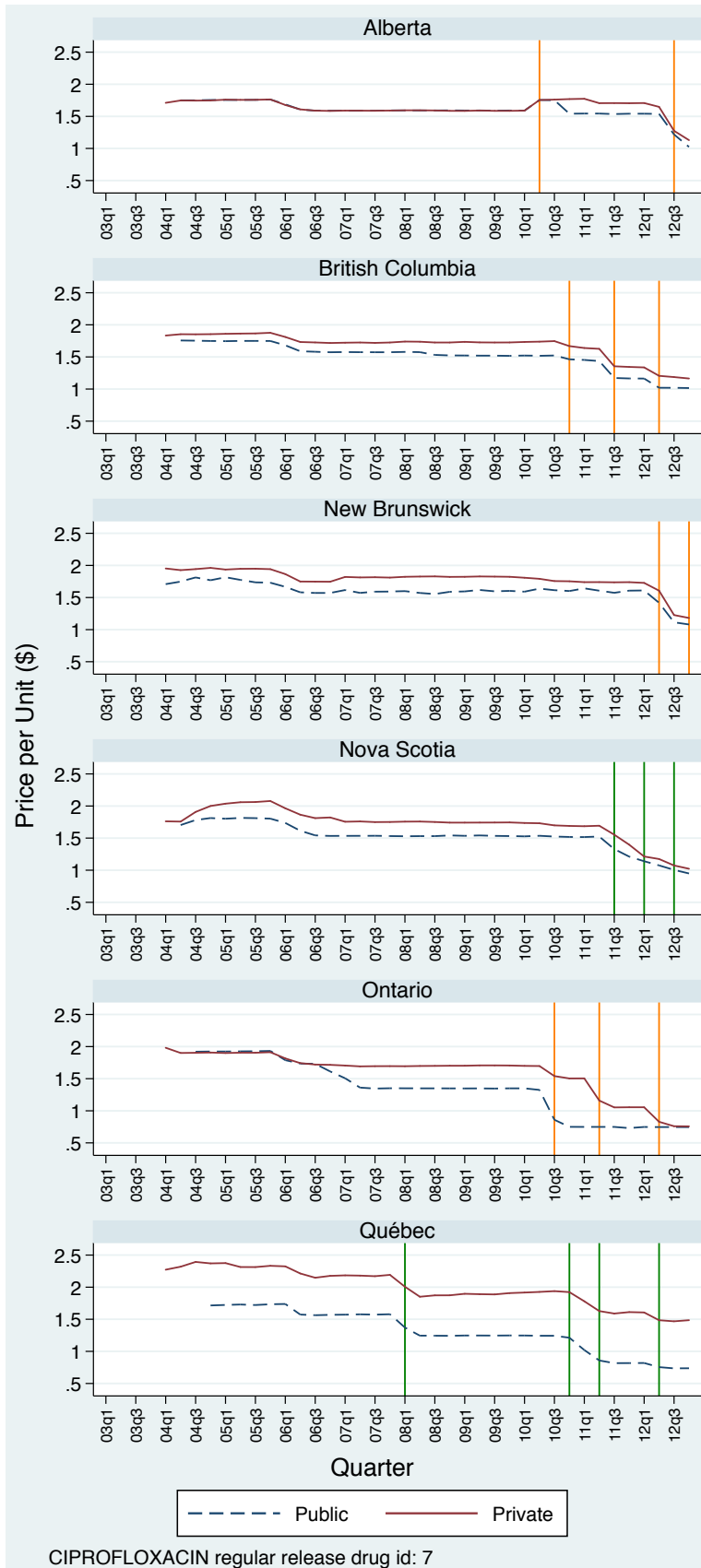
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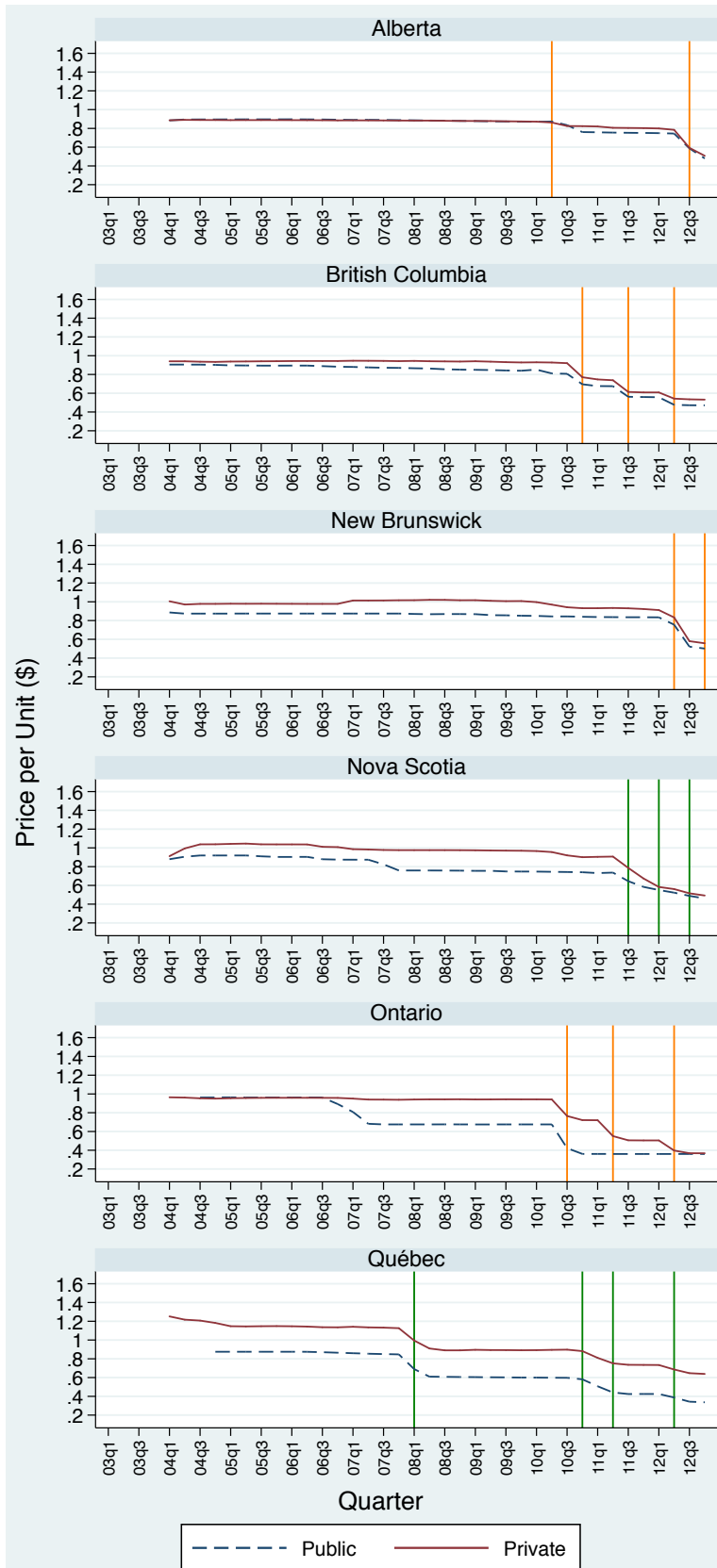


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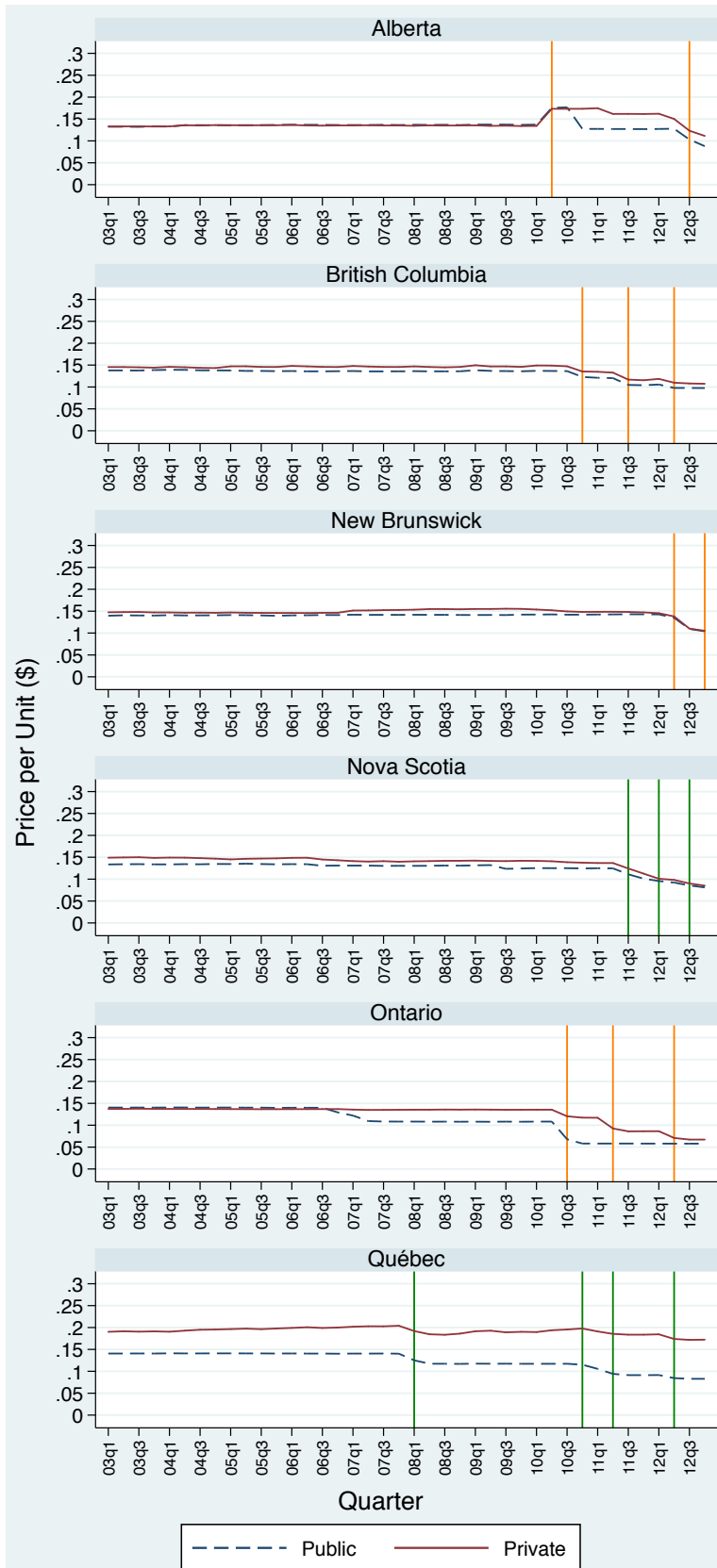


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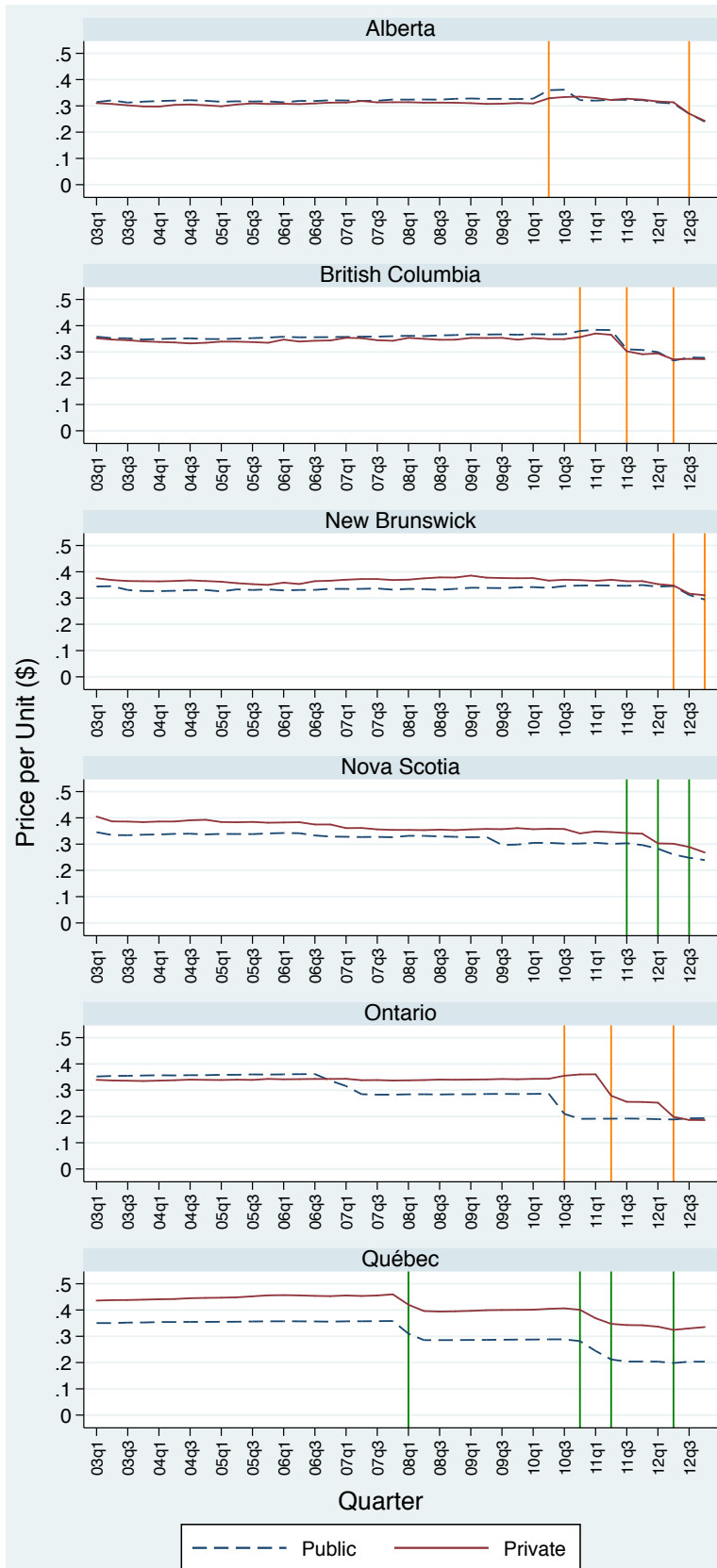




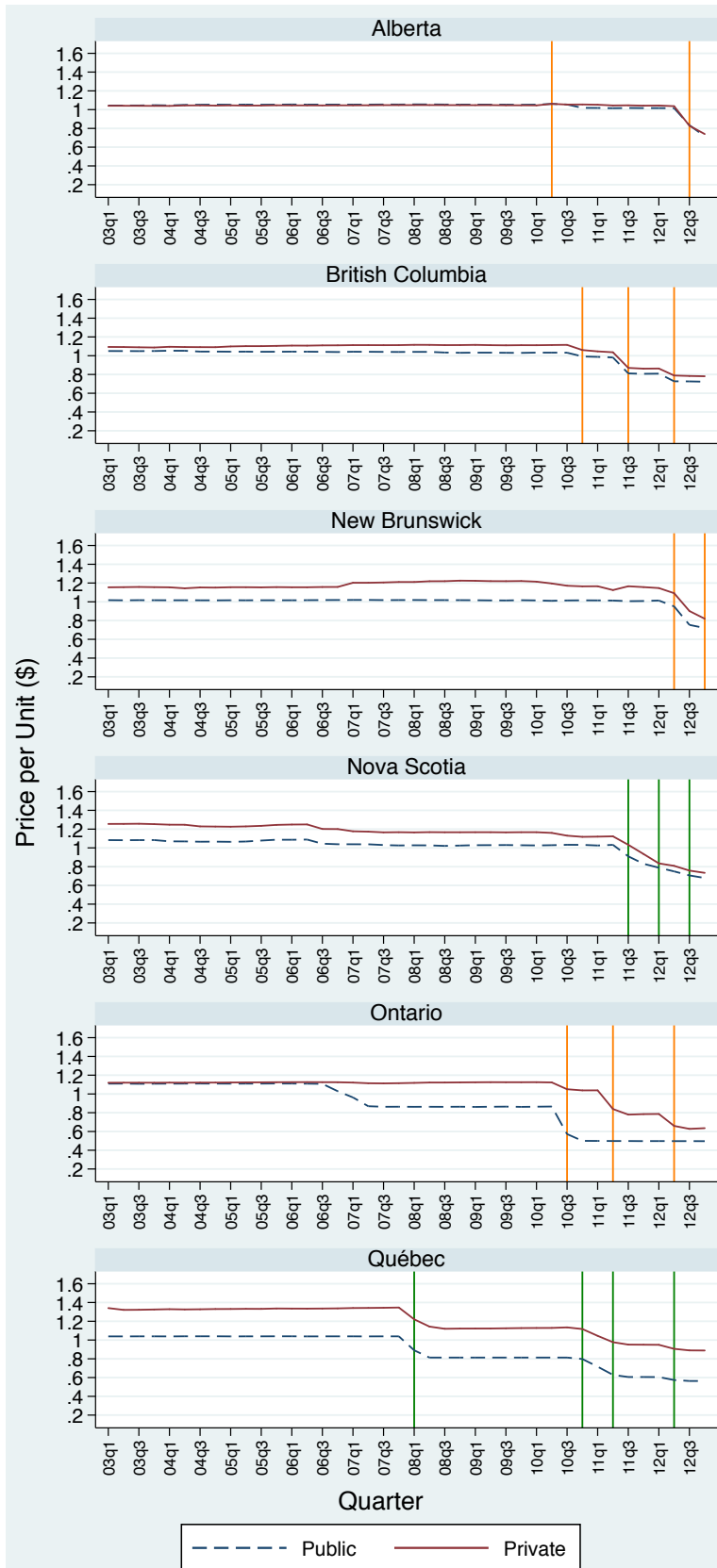
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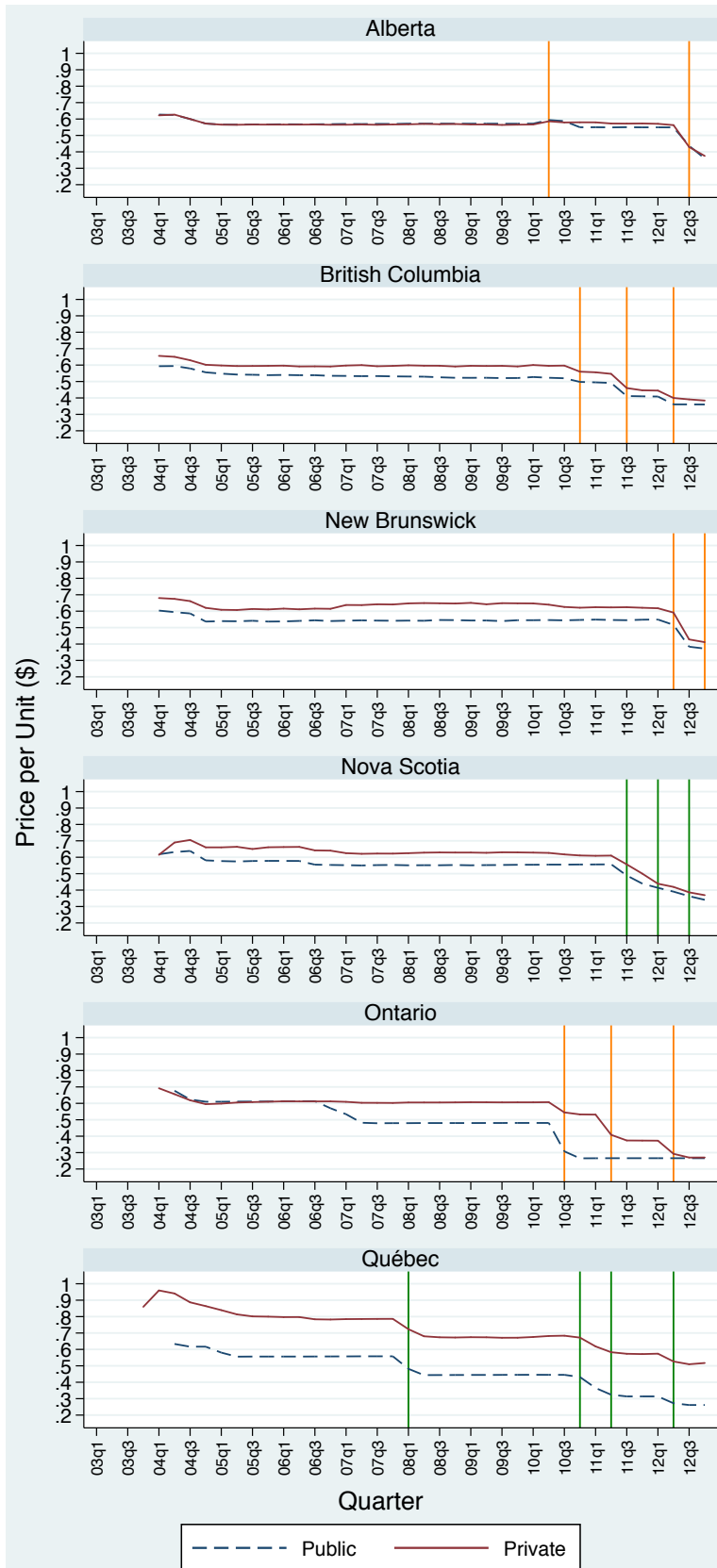
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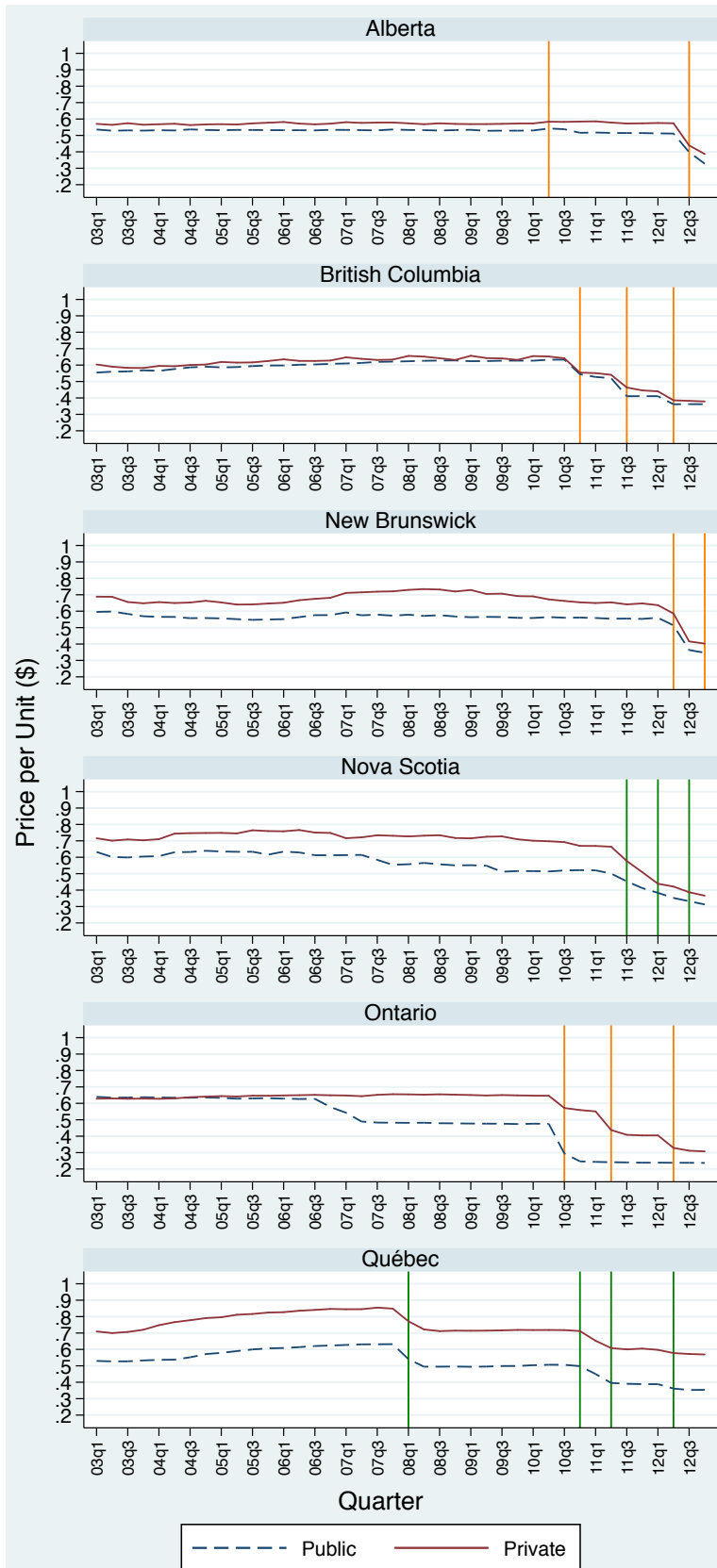
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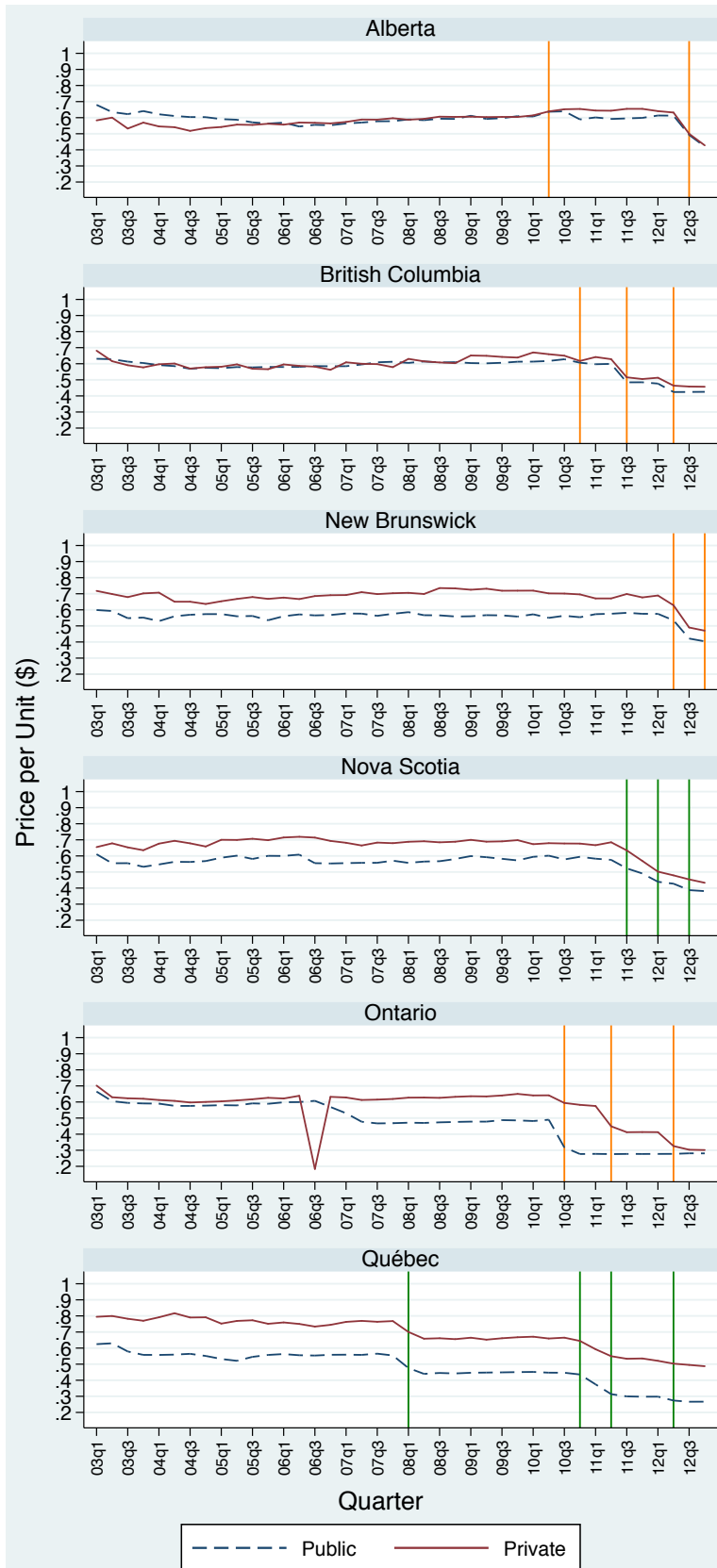
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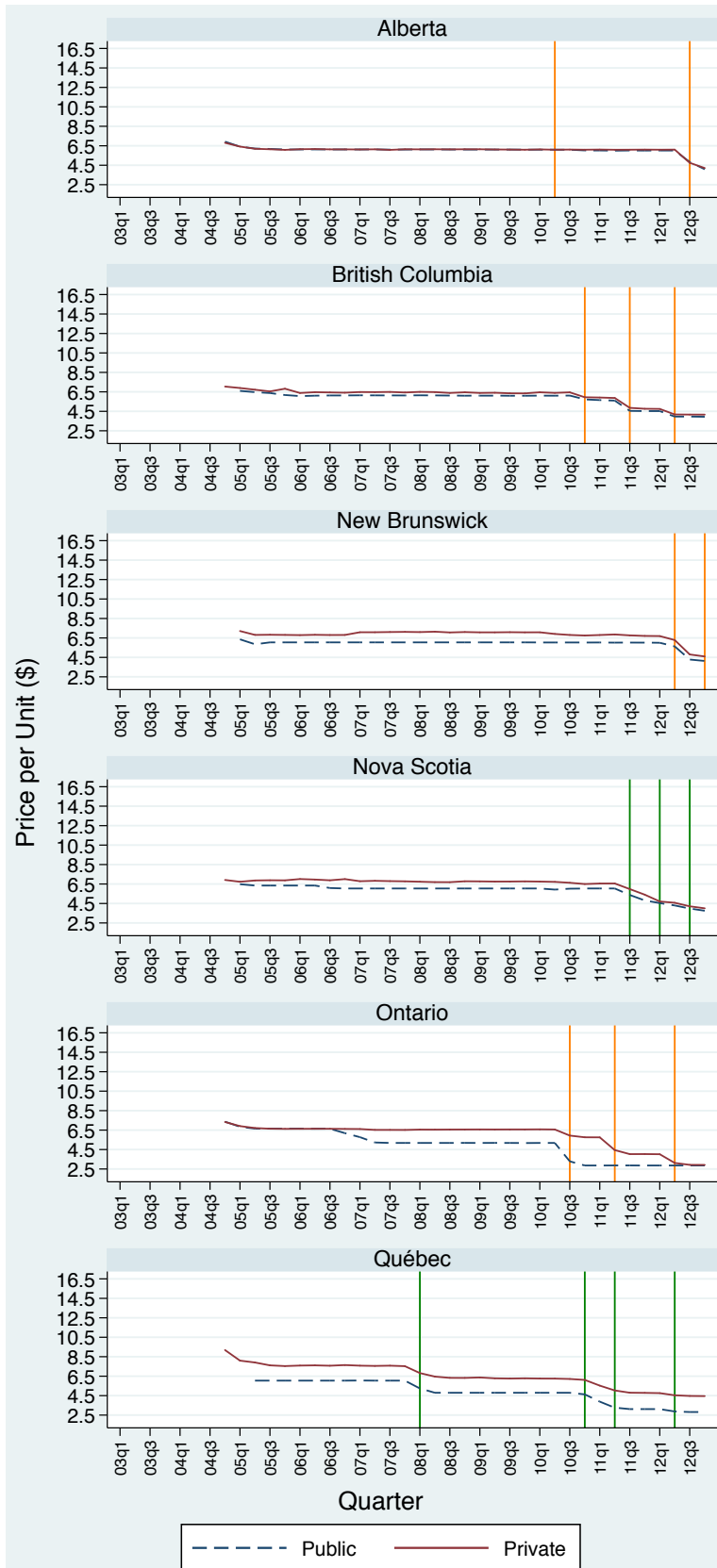
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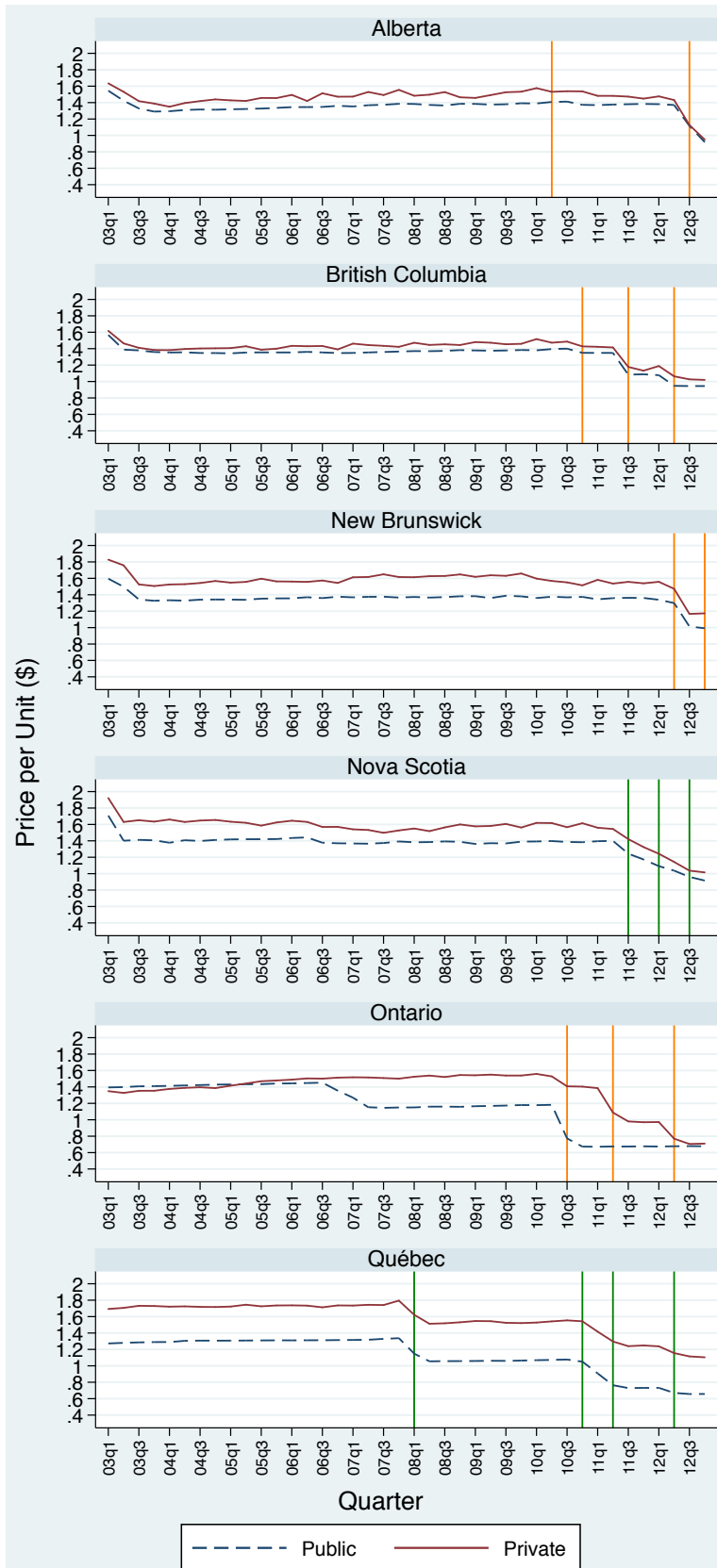
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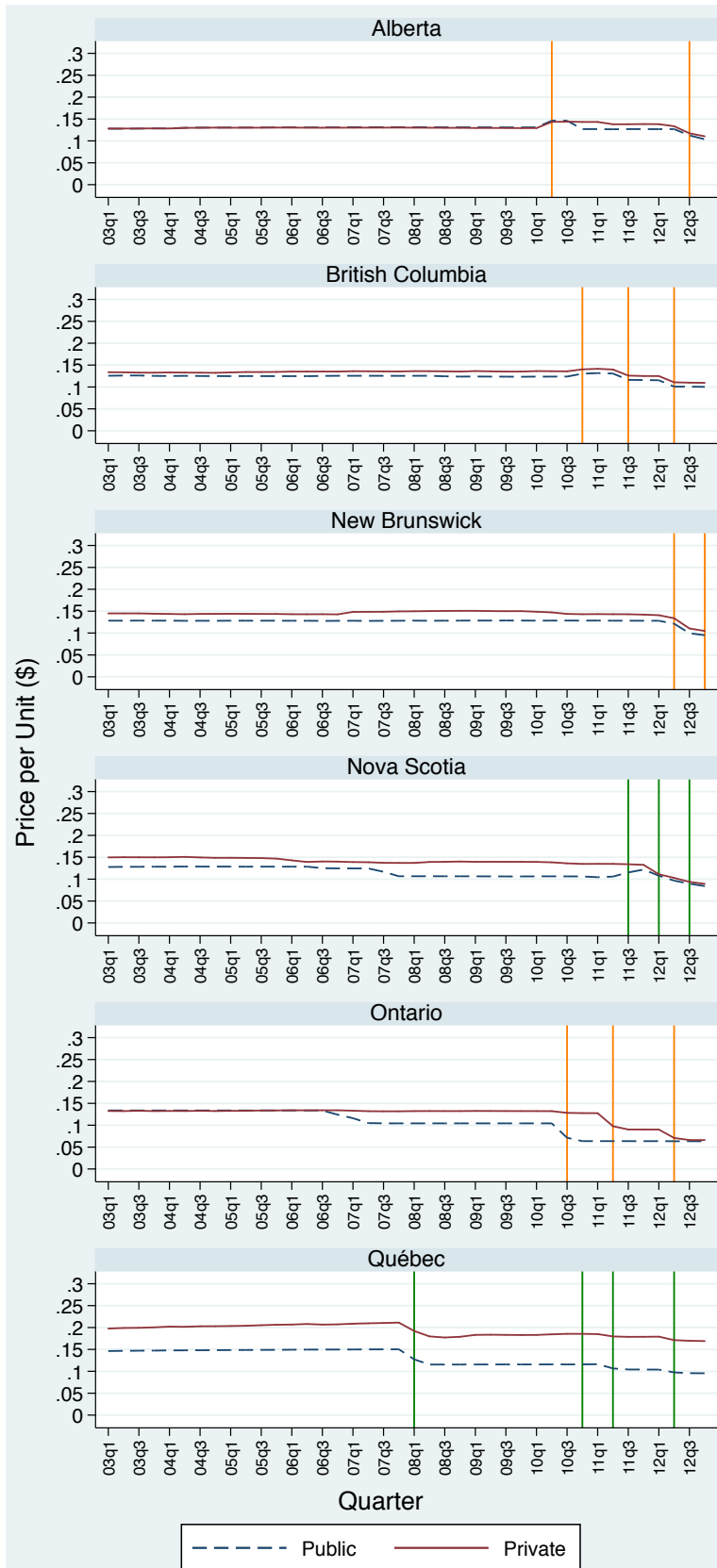
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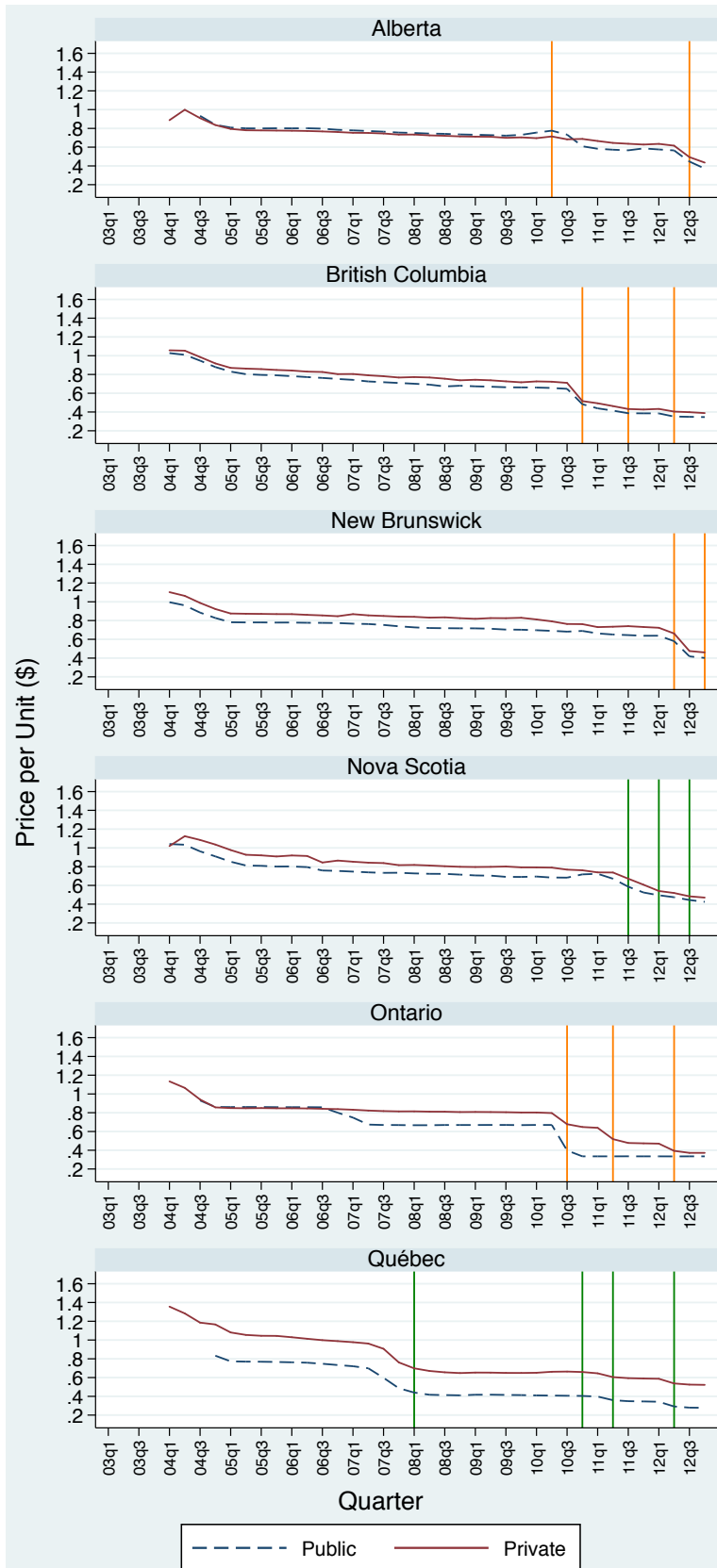
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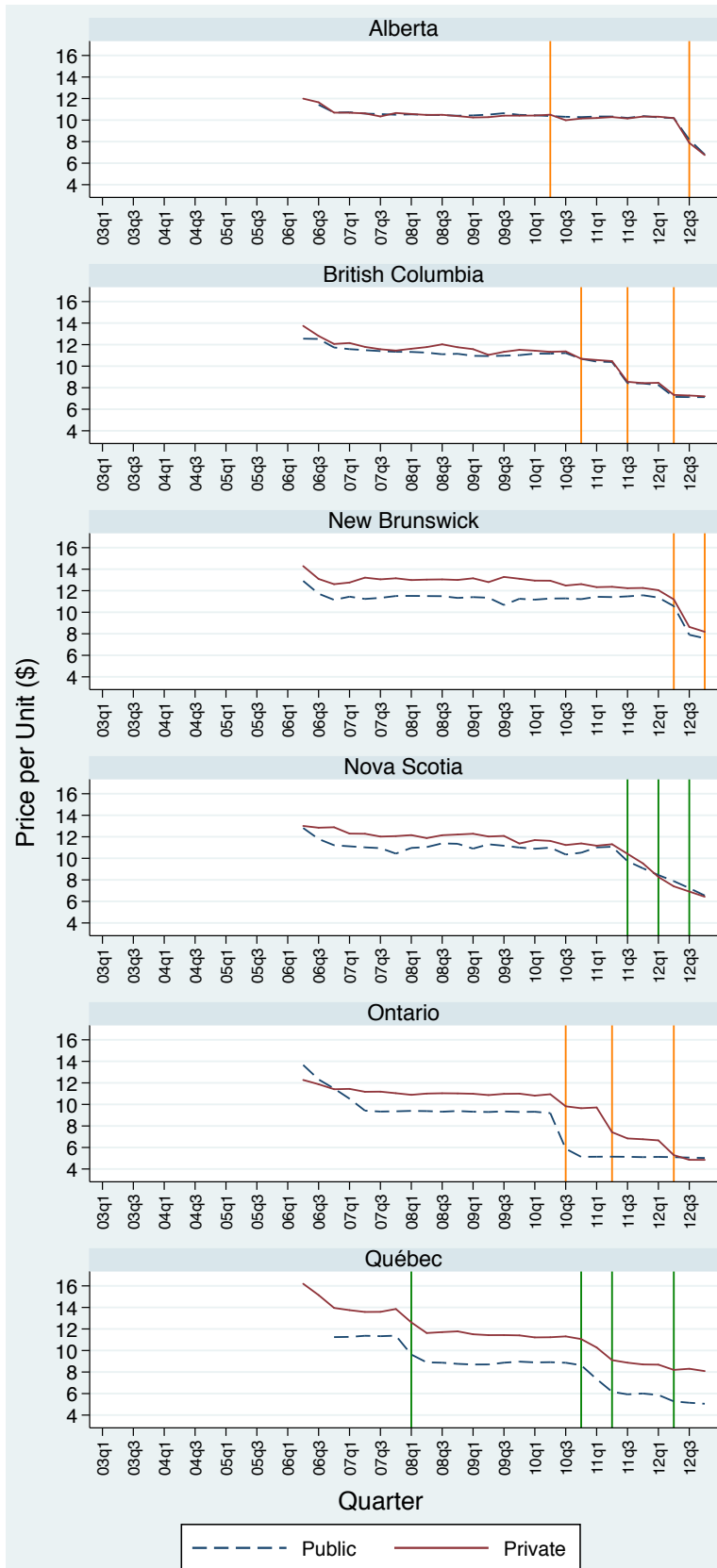
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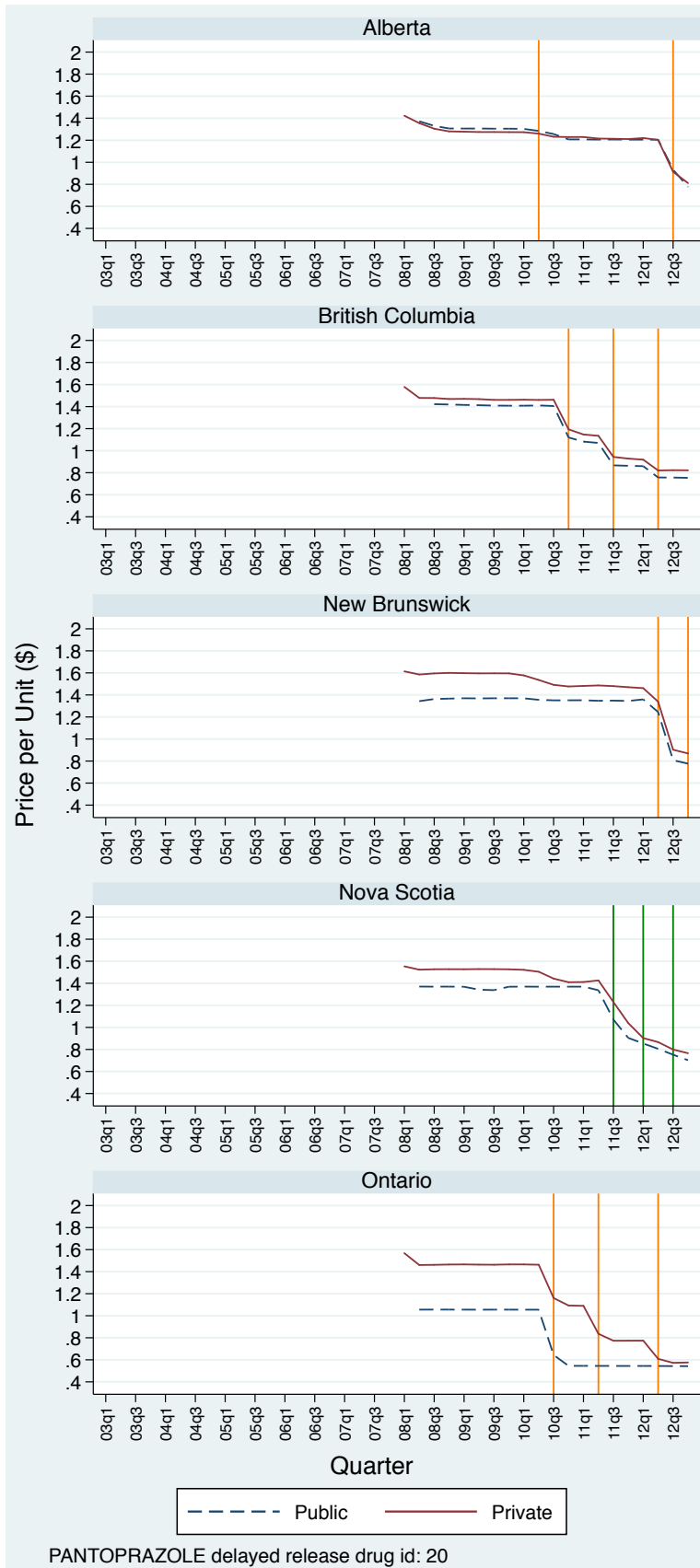
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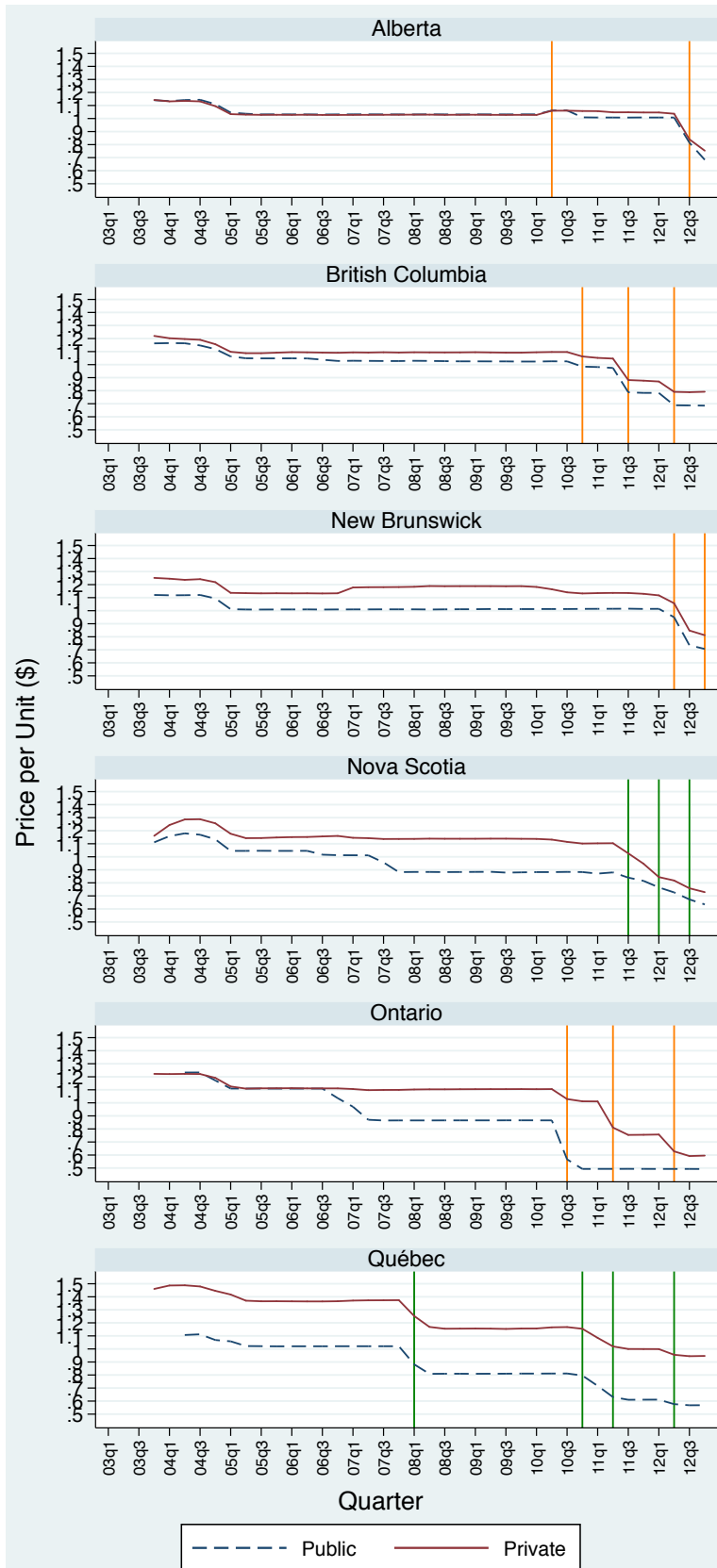


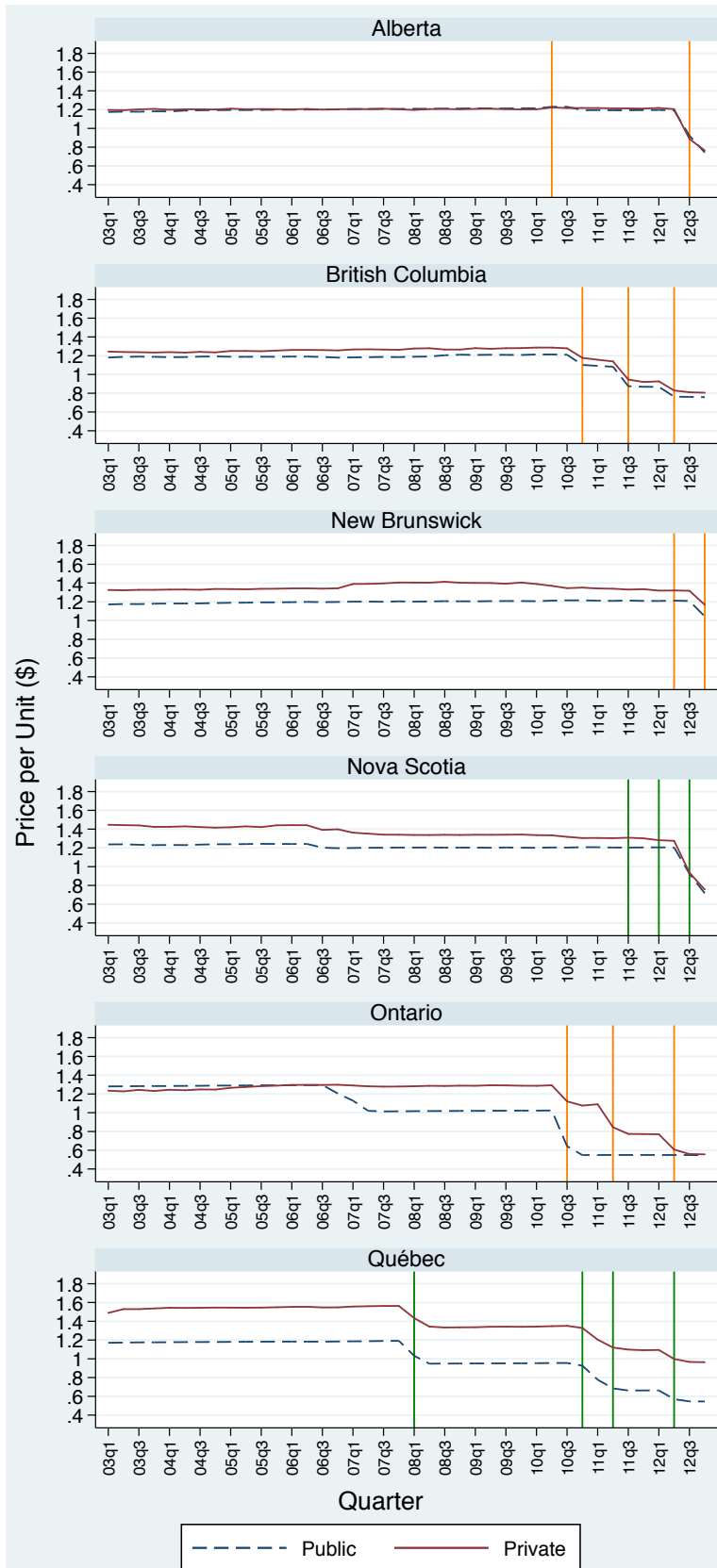
MIRTAZAPINE regular release drug id: 18



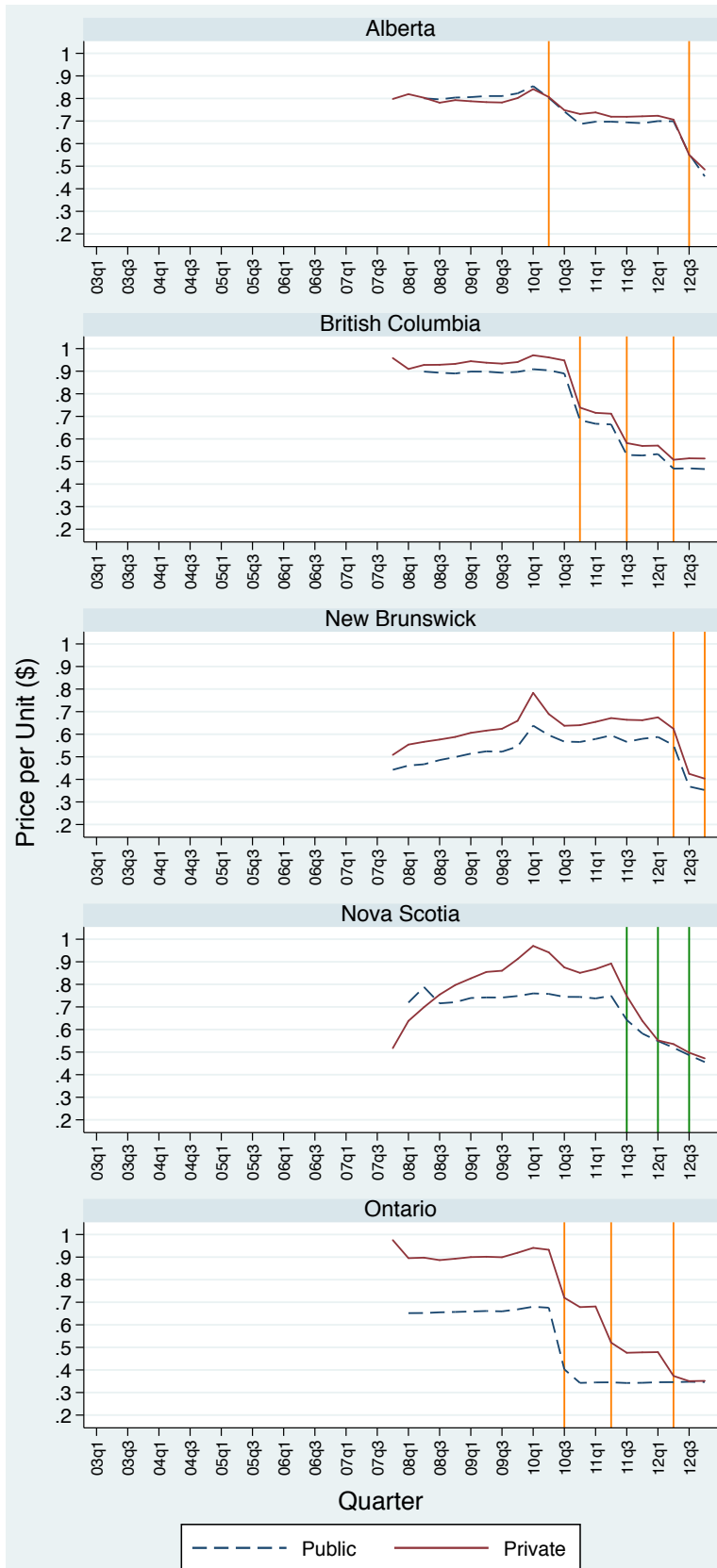
ONDANSETRON HCL regular release drug id: 19

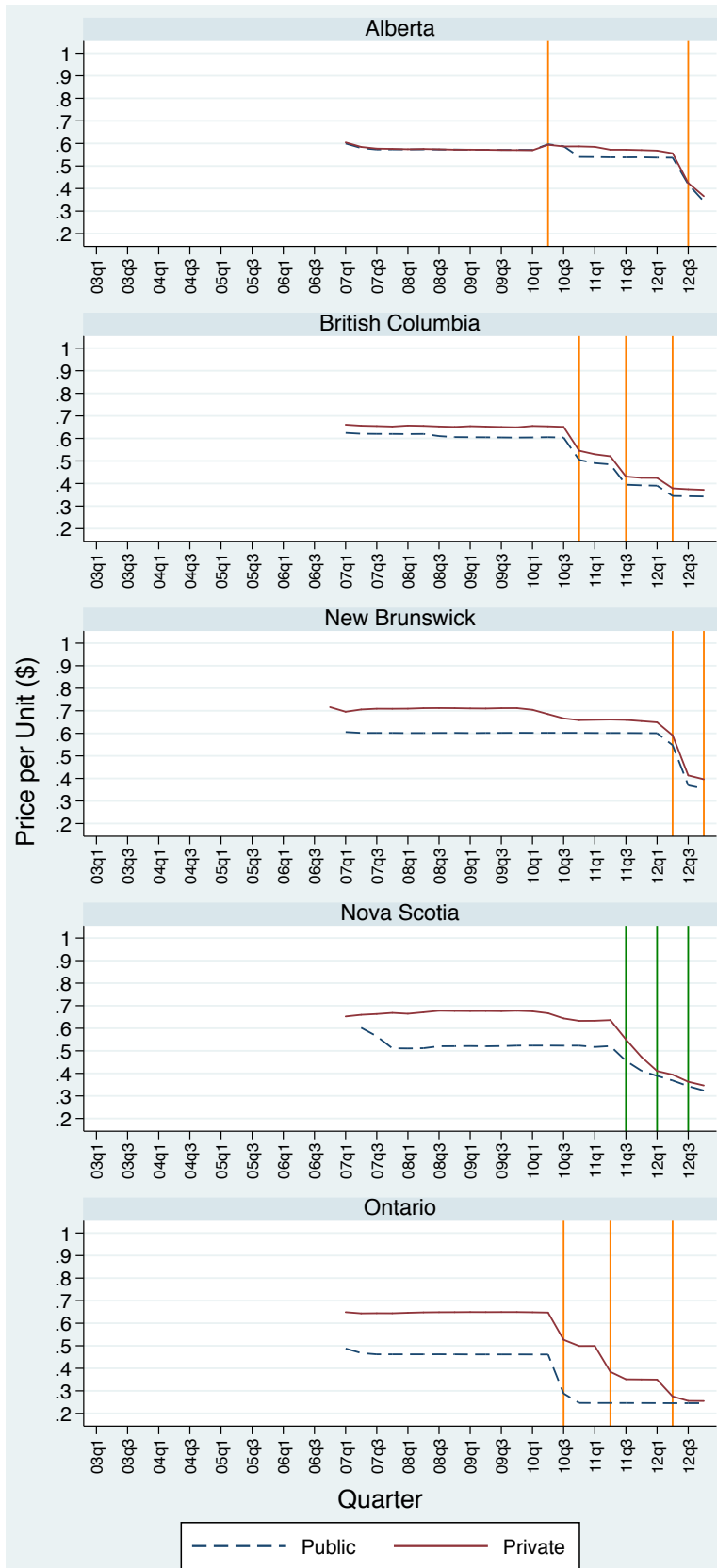




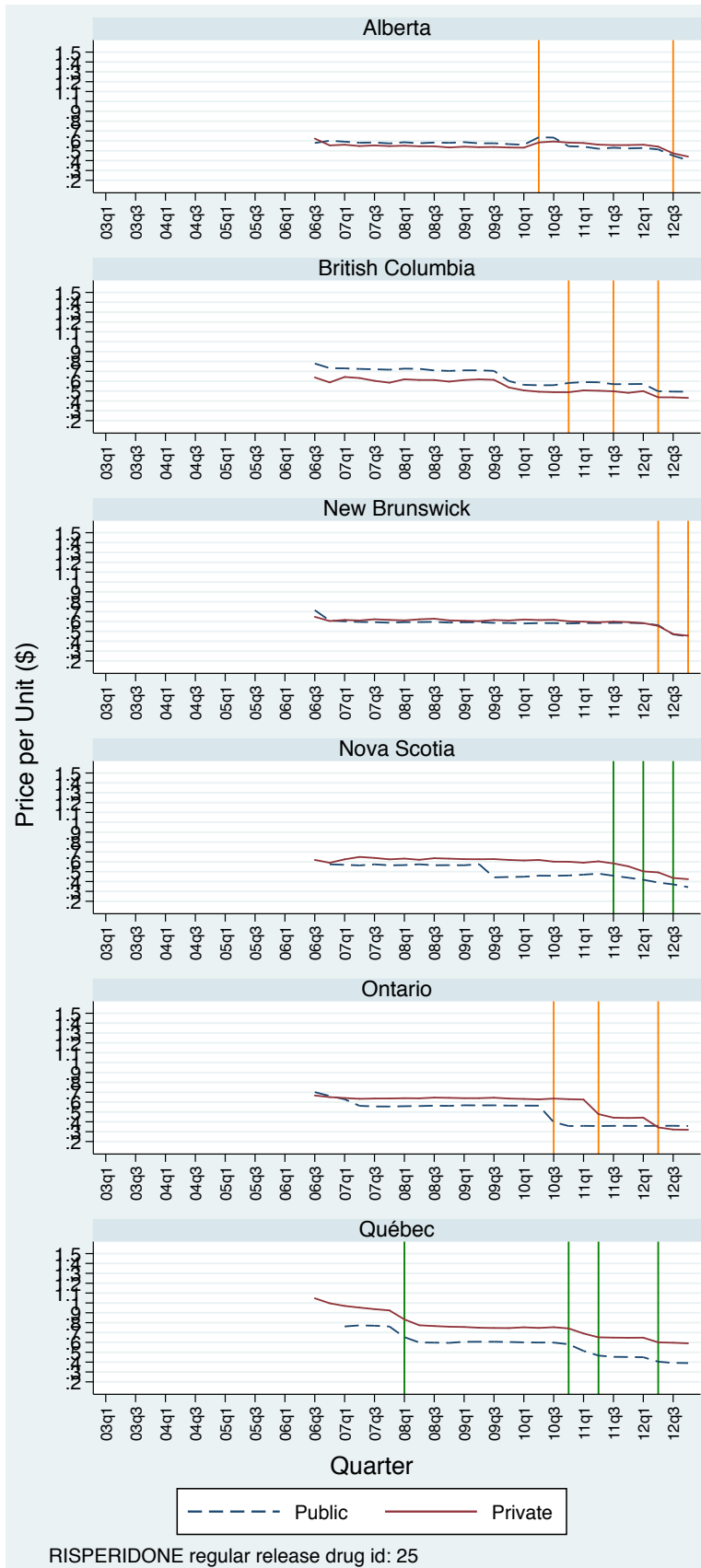


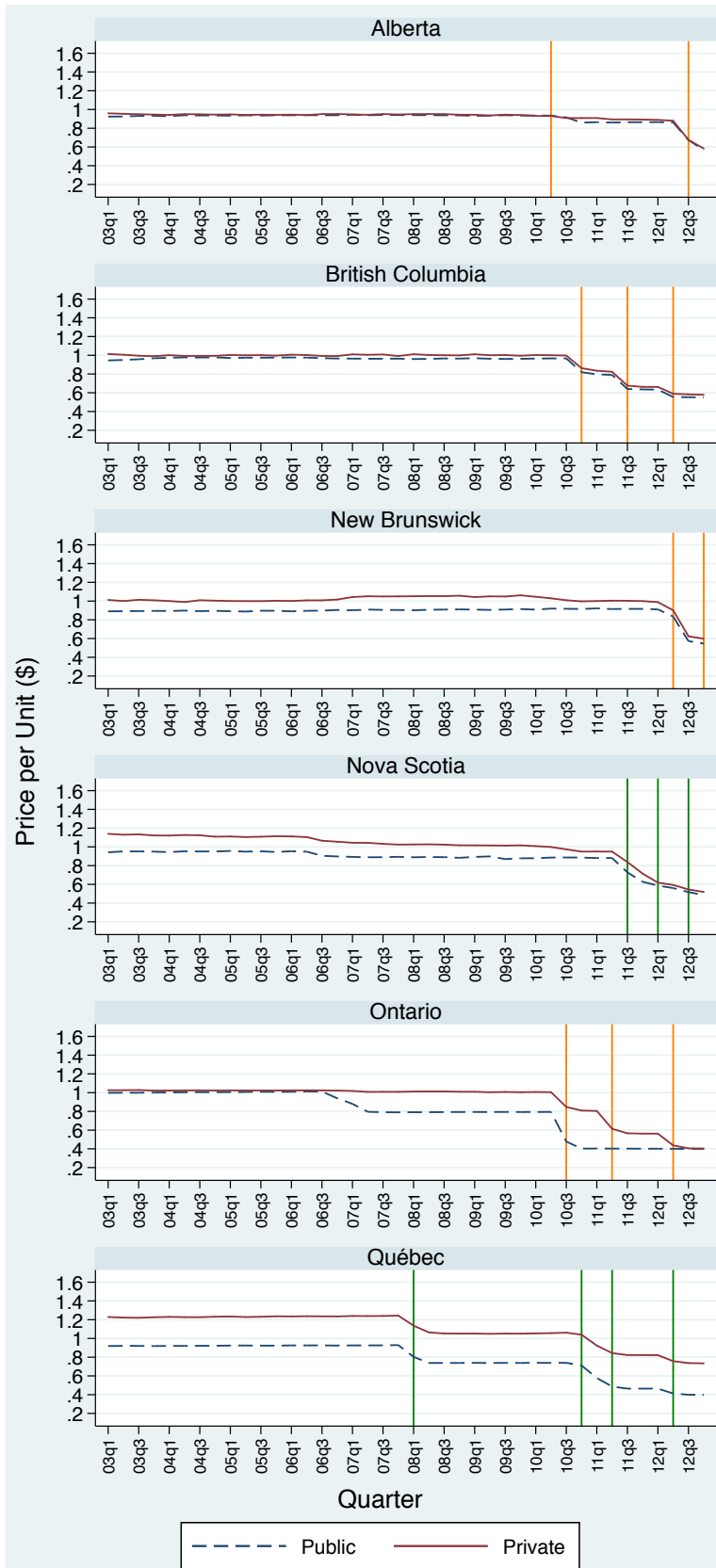
PRAVASTATIN regular release drug id: 22



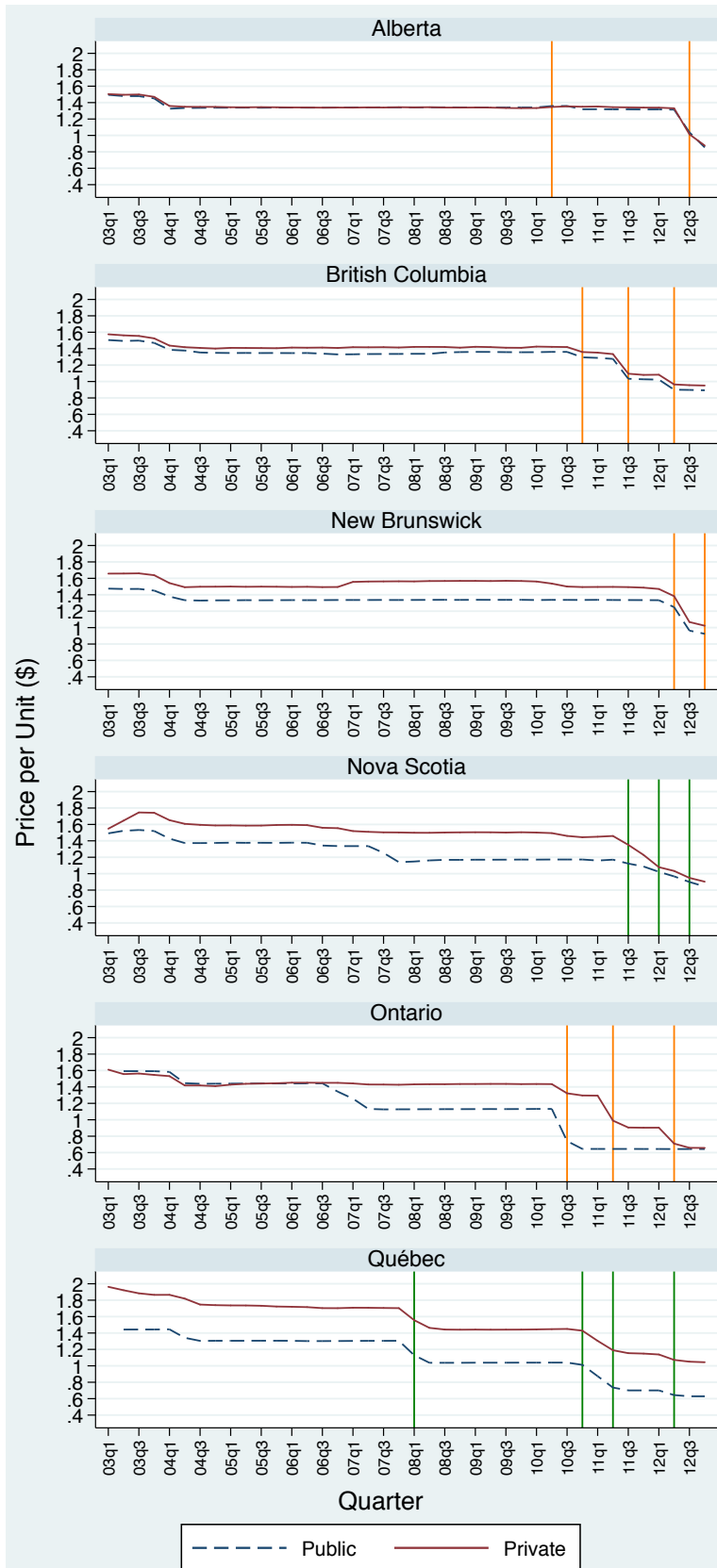


RAMIPRIL regular release drug id: 24

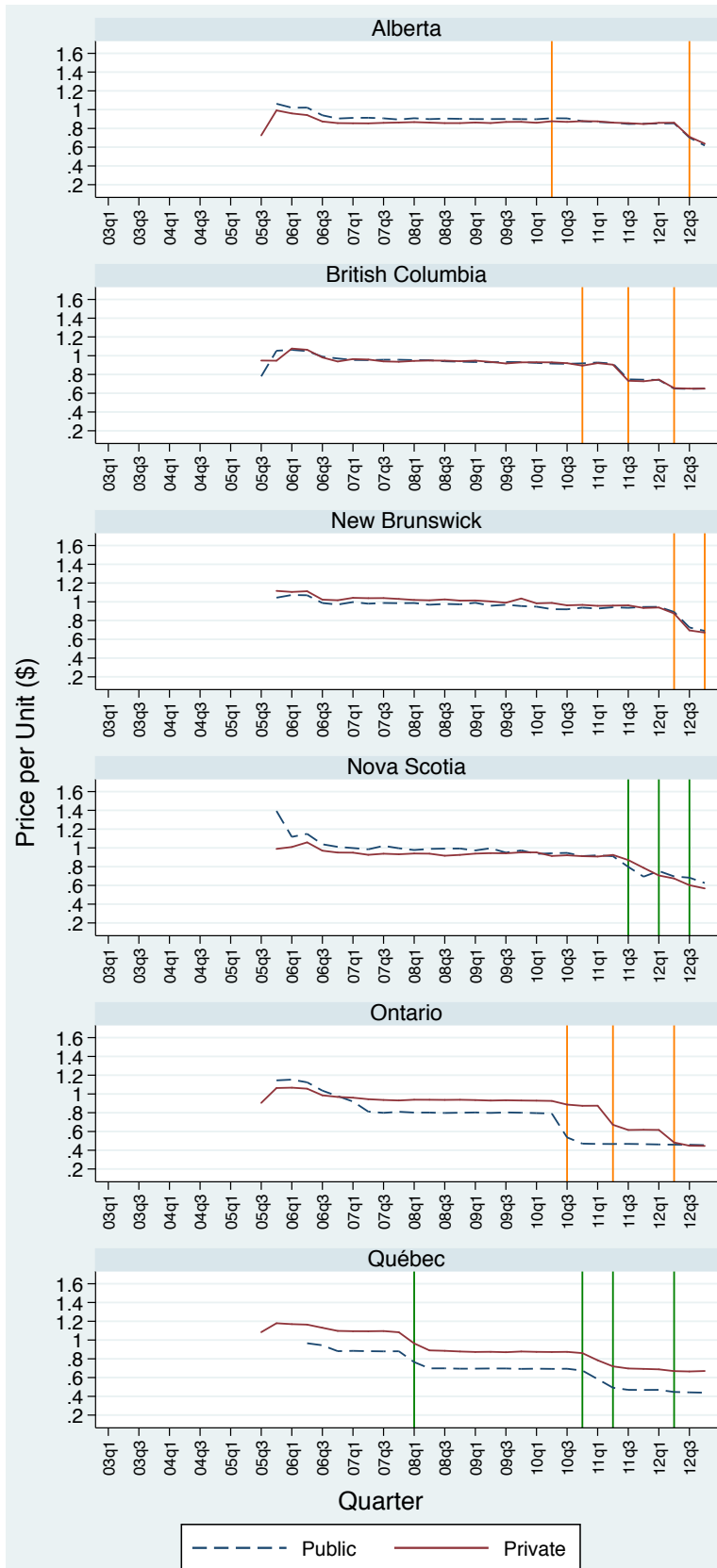




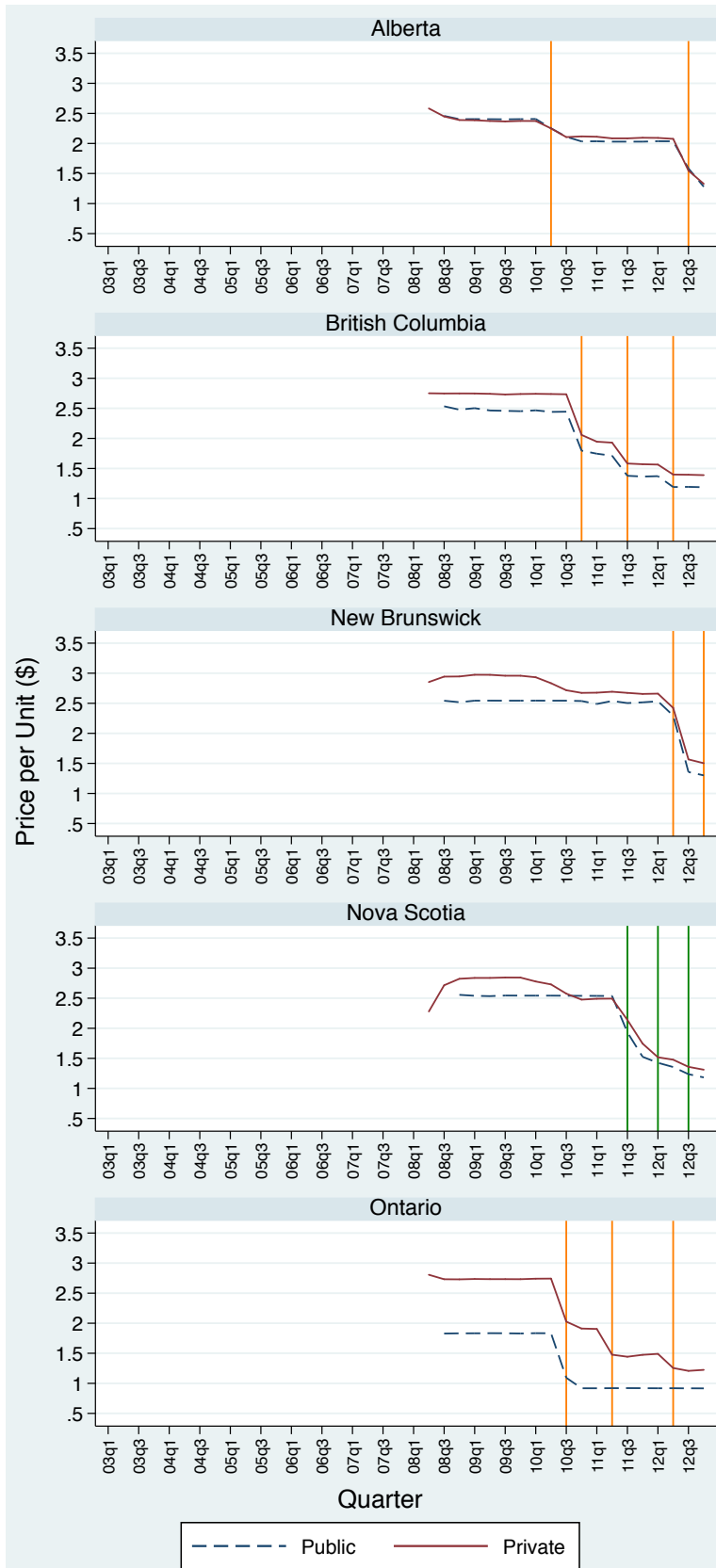
SERTRALINE regular release drug id: 26



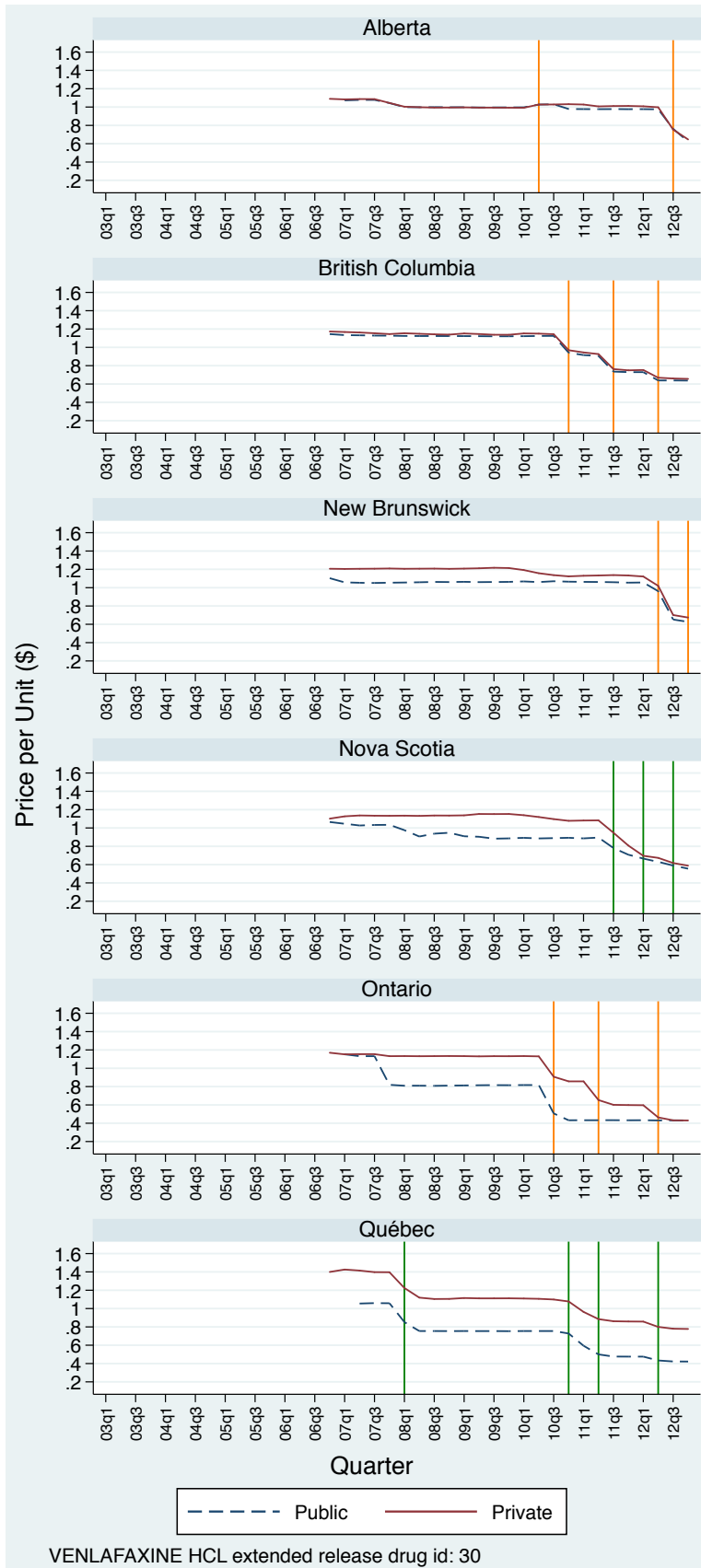
SIMVASTATIN regular release drug id: 27

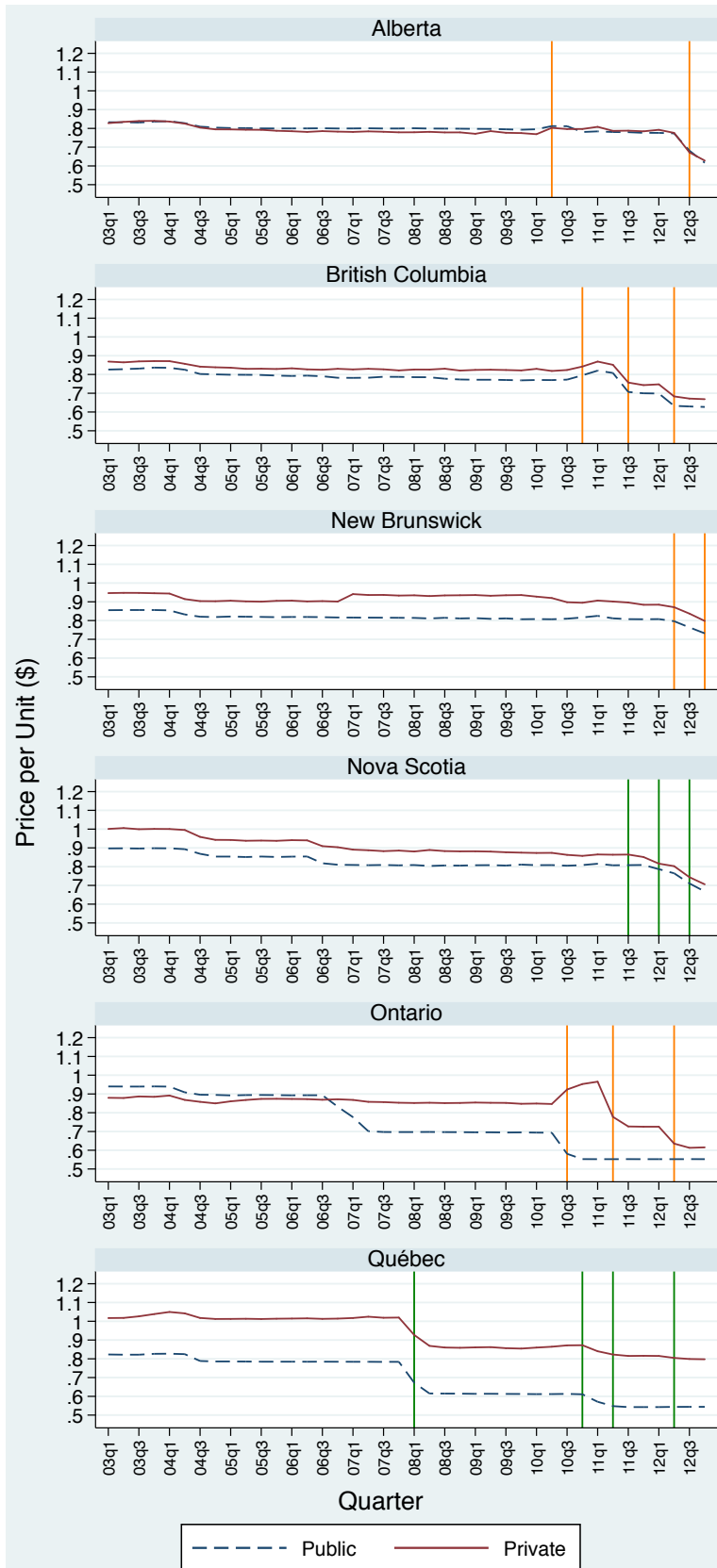


TOPIRAMATE regular release drug id: 28



VALACYCLOVIR HCL regular release drug id: 29





VERAPAMIL HCL extended release drug id: 31

Appendix C - Calculation of the Percentage Change in Average Unit Price Due to Each Regulation, by Province

Province	Policy	Plan Type	Mean Price			
			Before	After	Percentage Decrease	Expected Percentage Decrease
Alberta	July 2012 [56% to 35%]	Public	1.334732	0.8898129	33.334	
			(31)	(31)		
		Private	1.367164	0.9253704	32.315	37.5
			(31)	(31)		
British Columbia	October 2010 [65% to 50%]	Public	1.43271	1.288321*	10.078	
			(93)	(93)		23.1
		Private	1.515321	1.353611*	10.672	
			(93)	(93)		
	July 2011 [50% to 40%]	Public	1.288321	1.035031*	19.66	
			(93)	(93)		20.0
		Private	1.353611	1.099859*	18.746	
			(93)	(93)		
	April 2012 [40% to 35%]	Public	1.035031	0.8993218*	13.112	
			(93)	(93)		12.5
		Private	1.099859	0.9642926*	12.326	
			(93)	(93)		
New Brunswick	June 2012 [70% to 40%]	Public	1.421279	0.99956	29.672	
			(31)	(31)		42.9
		Private	1.54202	1.104834	28.352	

			(31)	(31)		
Nova Scotia	July 2011	Public	1.388963	1.115124	19.715	
	[63% to 45%]		(31)	(31)		28.6
		Private	1.505204	1.238267	17.734	
			(31)	(31)		
	January 2012	Public	1.115124	0.9975442	10.544	
	[45% to 40%]		(31)	(31)		11.1
		Private	1.238267	1.093733*	11.672	
			(31)	(31)		
	July 2012	Public	0.9975442	0.8434307	15.449	
	[40% to 35%]		(31)	(31)		12.5
		Private	1.03852	0.8877638	14.516	
			(31)	(31)		
Ontario	October 2006	Public	1.510611	1.207469	20.068	20.6
	[63% to 50%]		(75)	(84)		
	July 2010	Public	1.195482	0.6592944	44.851	50.0
	[Public 50% to 25%]		(93)	(93)		
	[Private 63% to 50%]	Private	1.509602	1.197751	20.658	20.6
			(93)	(93)		
	April 2011	Private	1.296038	.9202752	28.993	30.0

Quebec	[Private 50% to 35%]		(62)	(62)		
	April 2012	Private	0.9174763	.6777536	26.128	28.6
	[Private 35% to 25%]		(62)	(62)		
	February 2008	Public	1.450164	1.242786*	14.3	
	[63% to 54%]		(27)	(27)		
		Private	1.874952	1.586151	15.403	14.3
			(54)	(54)		
	November 2010 & April 2011	Public	1.141421	0.7758281	32.03	
	[54% to 37.5% to 30%]		(54)	(54)		44.4
		Private	1.575936	1.265342	19.709	
			(93)	(93)		
	April 2012	Public	0.7742527	0.6834199	11.732	
	[30% to 25%]		(54)	(54)		16.7
		Private	1.259001	1.168582	7.182	
			(54)	(54)		

* Discount occurred during the policy quarter. Note: Number of observations in parenthesis.

Alberta: Percentage change in price for April 2010 policy

Alberta		
Quarter	Mean Price	Percentage Change
2010Q1	1.401115 (31)	1.835 % increase
2010Q2	1.426826 (31)	
2010Q2	1.426826 (31)	2.115 % decrease
2010Q3	1.396651 (31)	
2011Q1	1.399093 (31)	0.865 % decrease
2011Q2	1.386992 (31)	
2012Q1	1.388343 (31)	1.525 % decrease
2012Q2	1.367164 (31)	

Note: Number of observations in parenthesis.

Appendix D - Linear Regression Results for the Change in the Difference Between Private Plan and Public Plan Generic Drug Prices Since 2003Q1, Ontario

	diffcostperunit
2003Q2	-0.014 (0.014)
2003Q3	-0.014 (0.016)
2003Q4	-0.016 (0.018)
2004Q1	-0.013 (0.018)
2004Q2	-0.017 (0.015)
2004Q3	-0.020 (0.015)
2004Q4	-0.022 (0.015)
2005Q1	-0.019

	(0.014)
2005Q2	-0.016
	(0.014)
2005Q3	-0.014
	(0.014)
2005Q4	-0.013
	(0.014)
2006Q1	-0.014
	(0.014)
2006Q2	-0.013
	(0.014)
2006Q3	-0.023
	(0.017)
2006Q4	0.024
	(0.016)
2007Q1	0.046
	(0.025)

2007Q2	0.092
	(0.038)*
2007Q3	0.095
	(0.039)*
2007Q4	0.112
	(0.041)*
2008Q1	0.115
	(0.042)**
2008Q2	0.118
	(0.042)**
2008Q3	0.118
	(0.042)**
2008Q4	0.119
	(0.043)**
2009Q1	0.118
	(0.043)**
2009Q2	0.117

		(0.043)**
2009Q3		0.117
		(0.043)*
2009Q4		0.117
		(0.043)*
2010Q1		0.118
		(0.043)*
2010Q2		0.116
		(0.043)*
2010Q3		0.200
		(0.062)**
2010Q4		0.222
		(0.068)**
2011Q1		0.221
		(0.067)**
2011Q2		0.103
		(0.038)*

2011Q3	0.073
	(0.030)*
2011Q4	0.073
	(0.030)*
2012Q1	0.072
	(0.030)*
2012Q2	-0.002
	(0.019)
2012Q3	-0.021
	(0.018)
2012Q4	-0.021
	(0.018)
ATENOLOL regular release	-0.079
	(0.001)**
AZITHROMYCIN regular release	0.432
	(0.013)**
BISOPROLOL FUMARATE regular release	-0.097

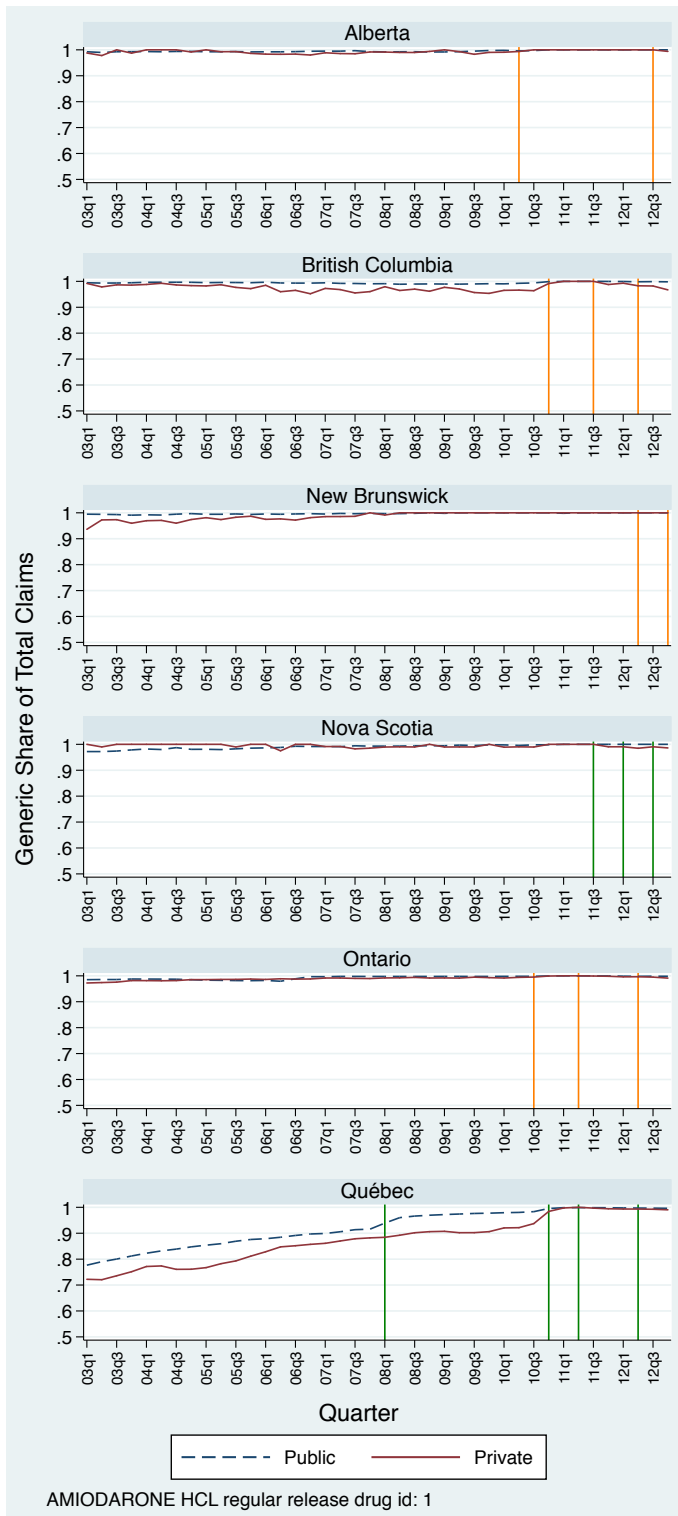
	(0.009)**
CARBAMAZEPINE extended release	-0.093
	(0.004)**
CARVEDILOL regular release	-0.011
	(0.008)
CIPROFLOXACIN regular release	0.118
	(0.007)**
CITALOPRAM HBR regular release	0.030
	(0.009)**
CLONAZEPAM regular release	-0.111
	(0.004)**
DIVALPROEX delayed release	-0.092
	(0.004)**
FLUOXETINE regular release	0.056
	(0.003)**
FOSINOPRIL regular release	-0.048
	(0.003)**

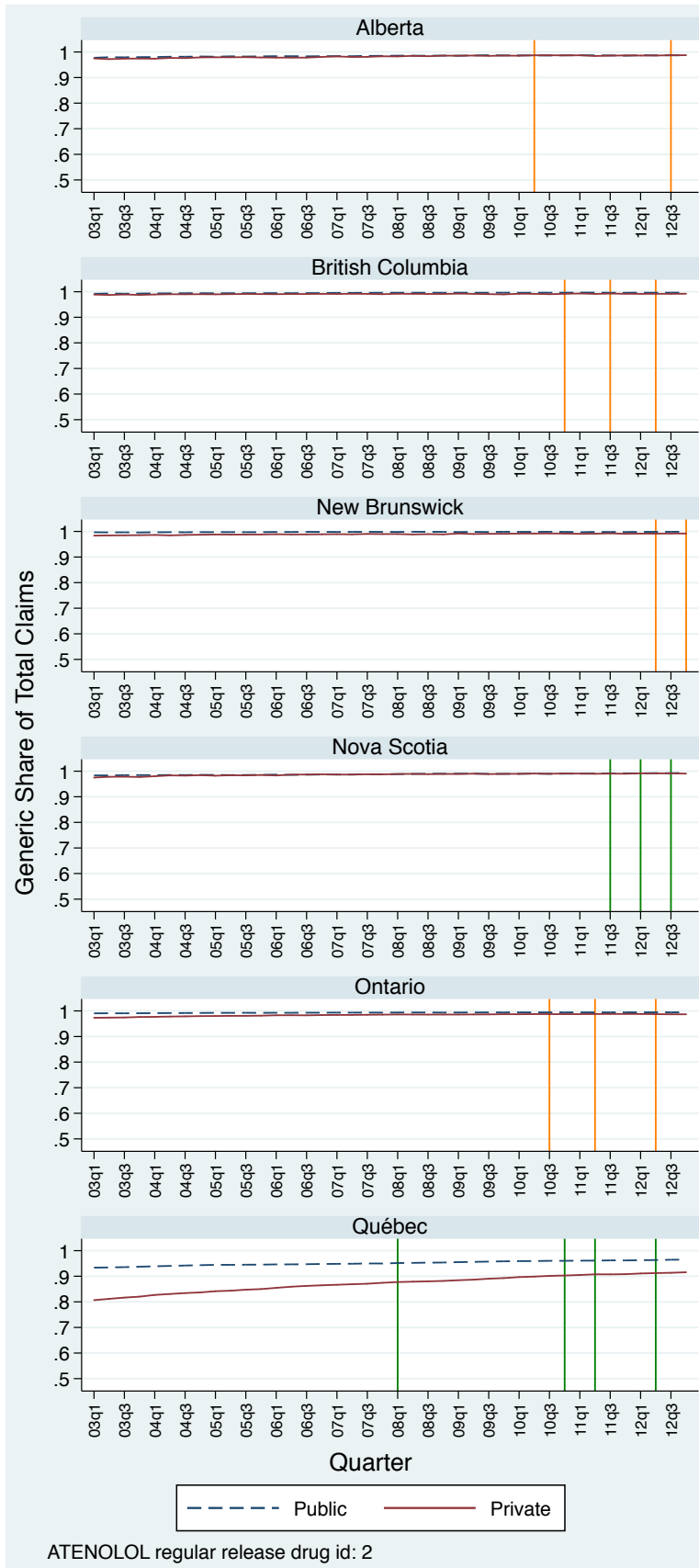
GABAPENTIN regular release	-0.001 (0.006)
LAMOTRIGINE regular release	-0.036 (0.007)**
LEFLUNOMIDE regular release	0.963 (0.011)**
LOVASTATIN regular release	0.050 (0.005)**
METFORMIN regular release	-0.113 (0.006)**
MIRTAZAPINE regular release	-0.027 (0.009)**
ONDANSETRON HCL regular release	1.491 (0.015)**
PANTOPRAZOLE delayed release	0.158 (0.018)**
PAROXETINE regular release	0.042

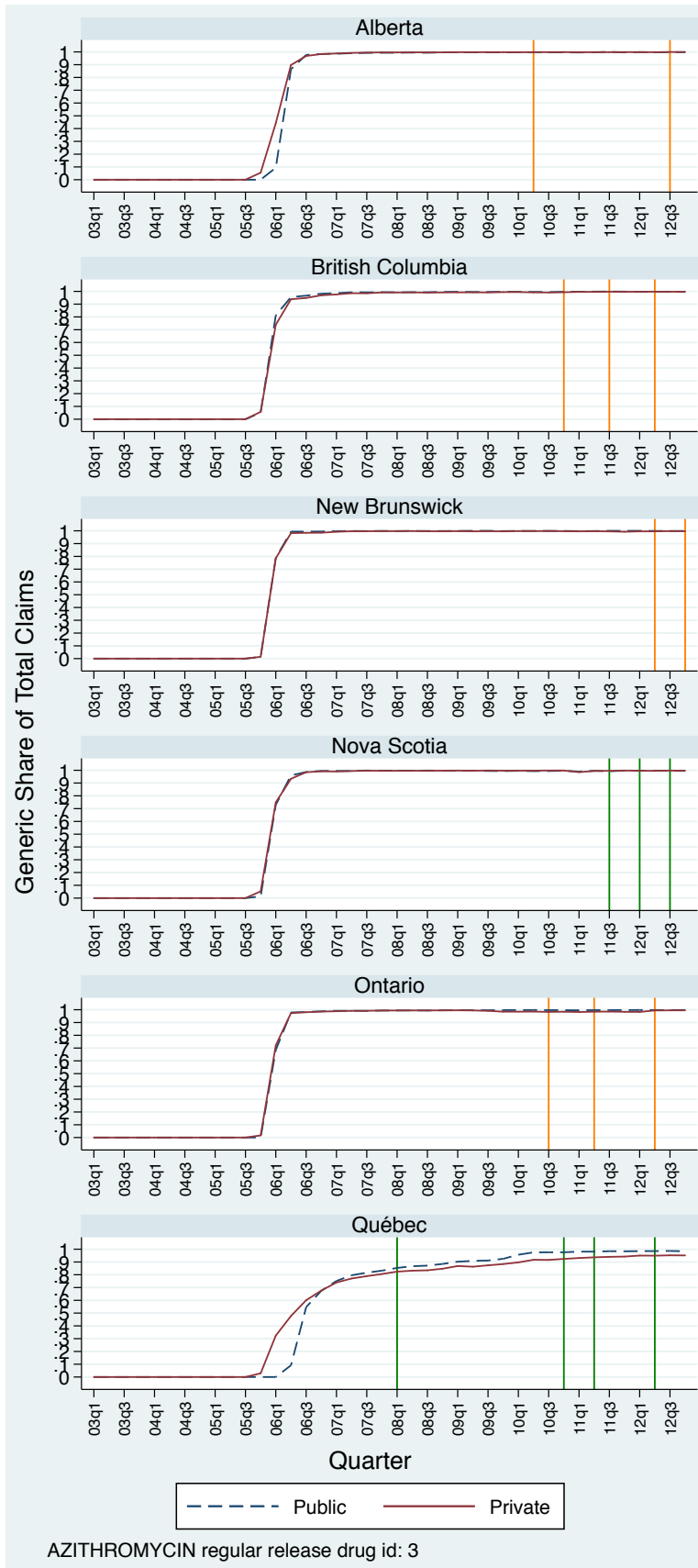
	(0.005)**
PRAVASTATIN regular release	0.009
	(0.002)**
RABEPRAZOLE SODIUM delayed release	0.030
	(0.019)
RAMIPRIL regular release	-0.010
	(0.019)
RISPERIDONE regular release	-0.083
	(0.017)**
SERTRALINE regular release	0.010
	(0.002)**
SIMVASTATIN regular release	0.051
	(0.001)**
TOPIRAMATE regular release	-0.028
	(0.013)*
VALACYCLOVIR HCL regular release	0.540
	(0.017)**

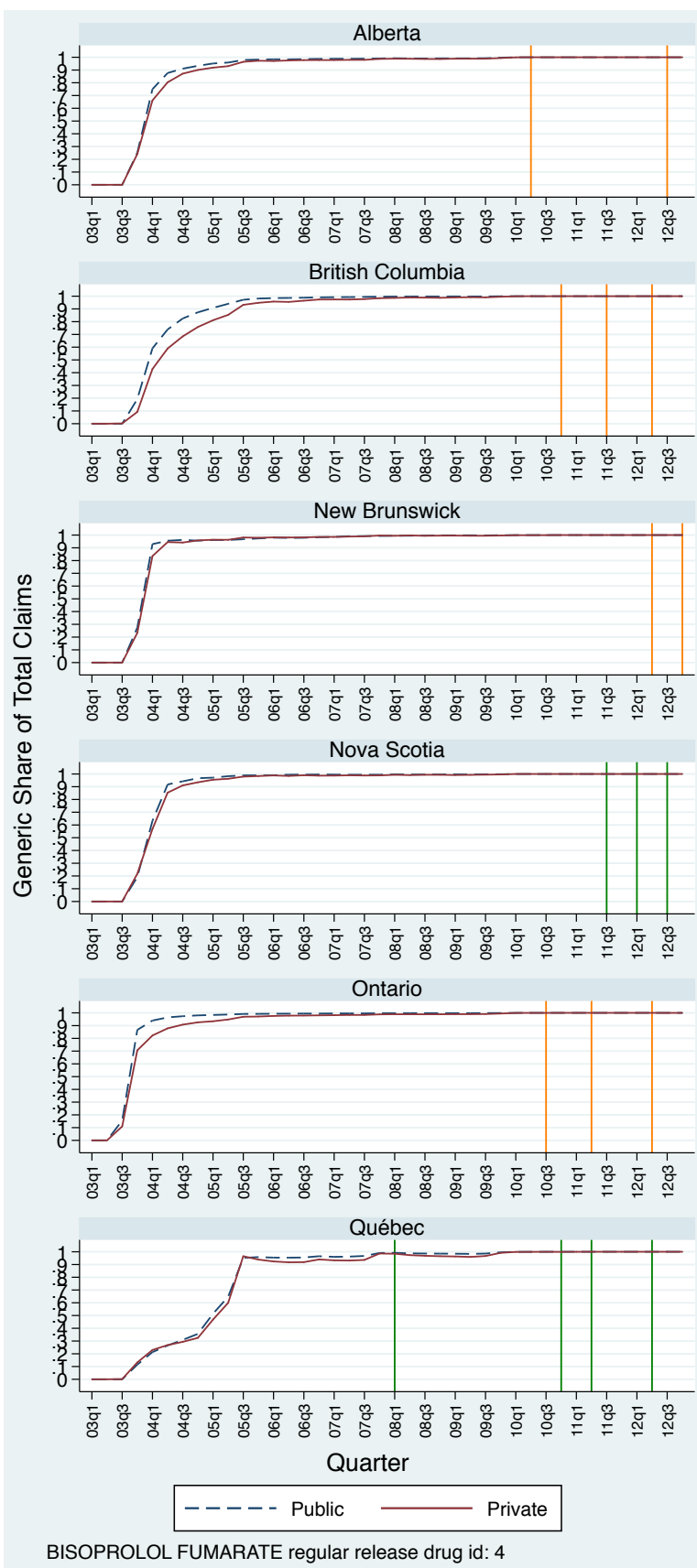
VENLAFAXINE HCL extended release	0.067 (0.018)**
VERAPAMIL HCL extended release	-0.035 (0.000)**
Constant	0.066 (0.021)**
R^2	0.73
N	1,052

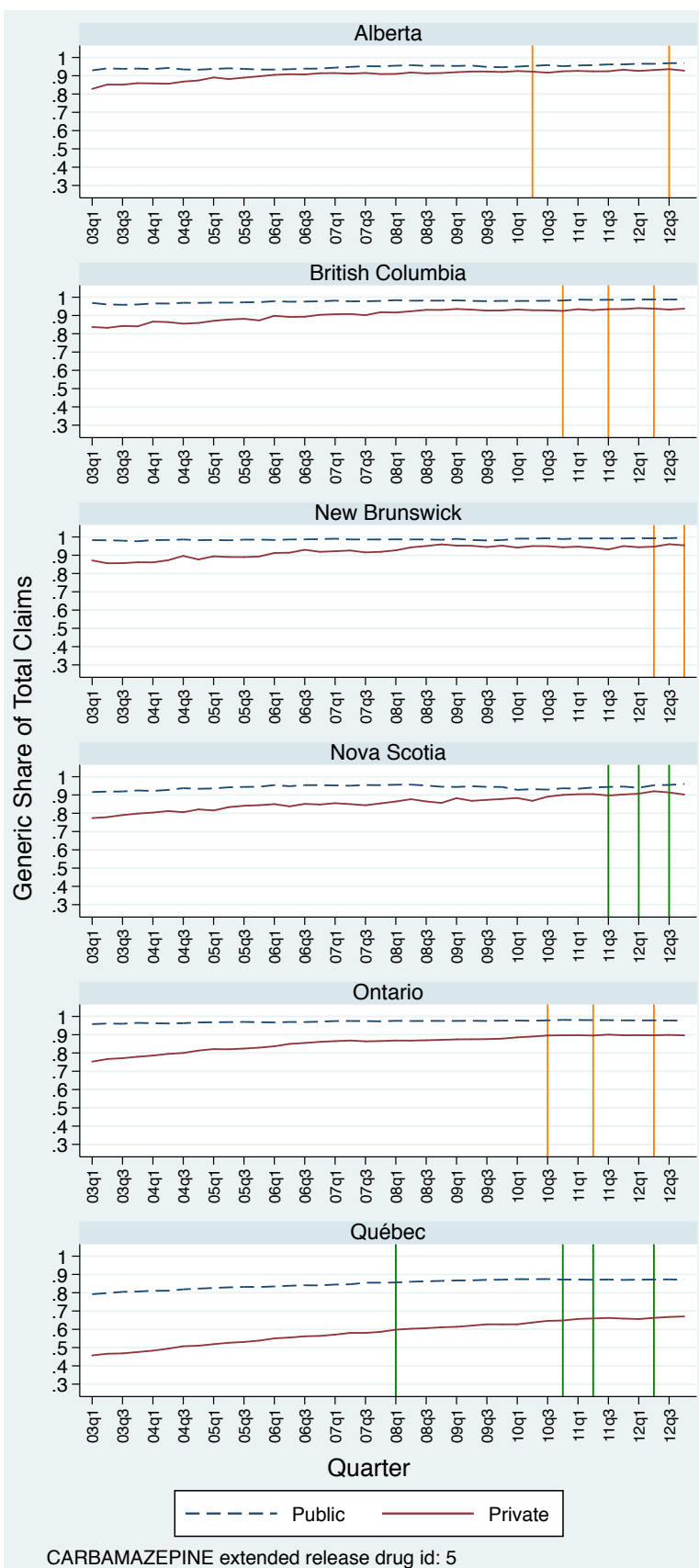
Appendix E - Graphs: Generic Drug Share of Total Prescription Claims, by Plan Type & Province (2003-2012)

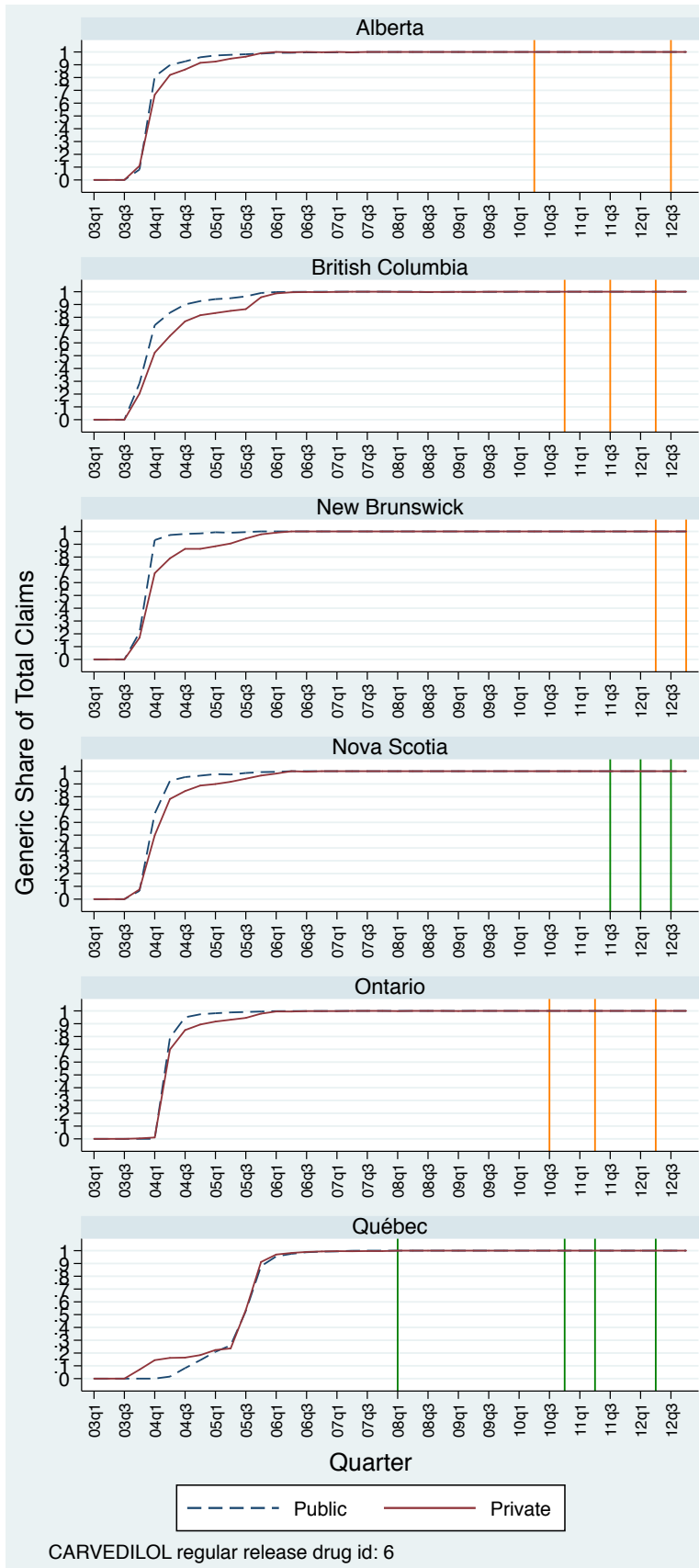


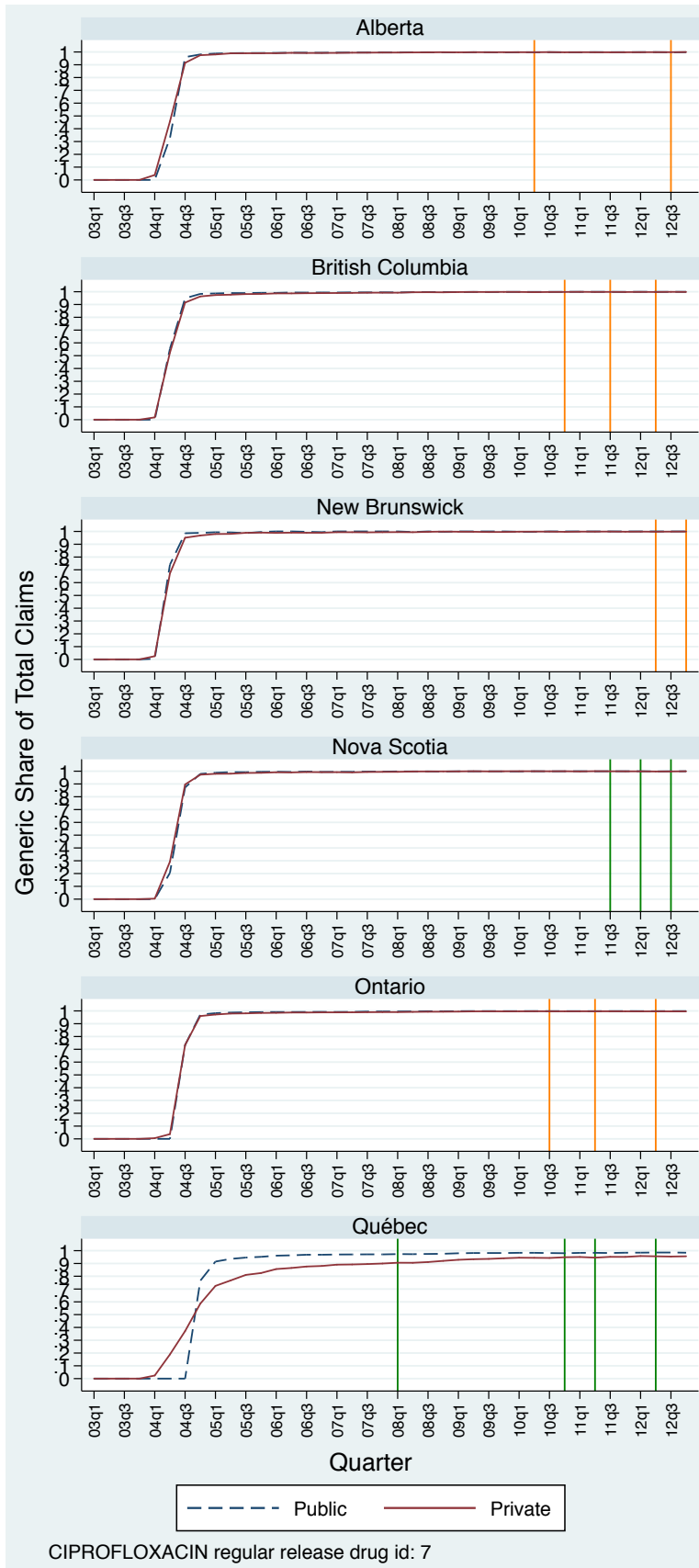


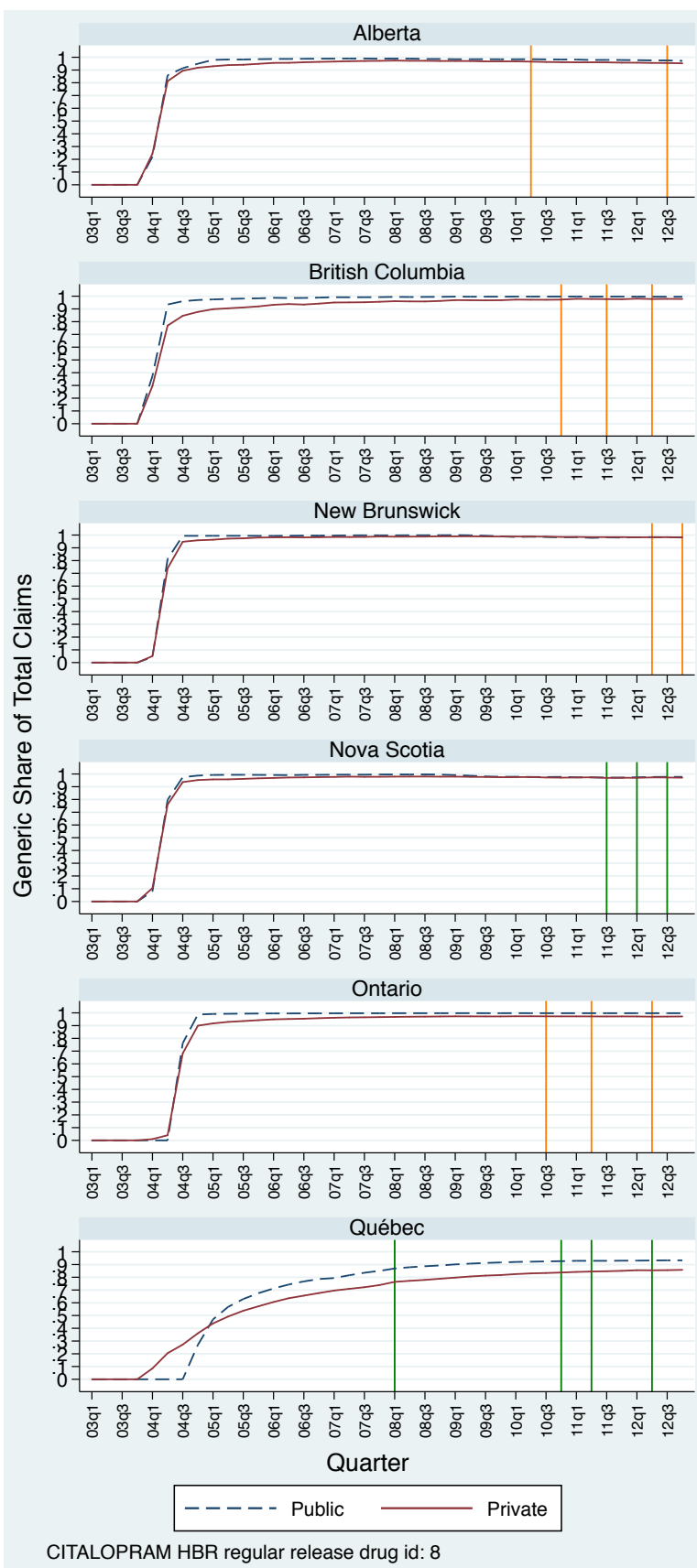


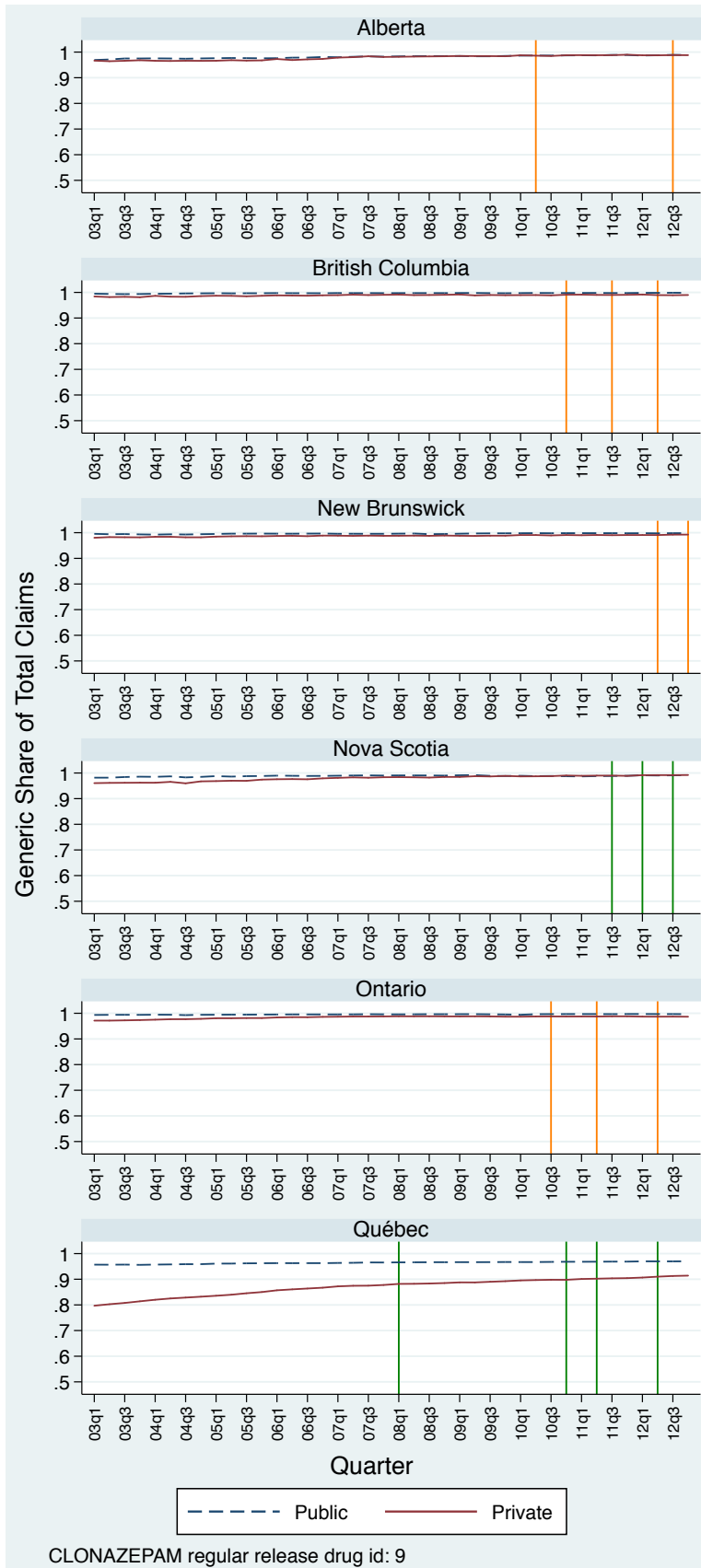


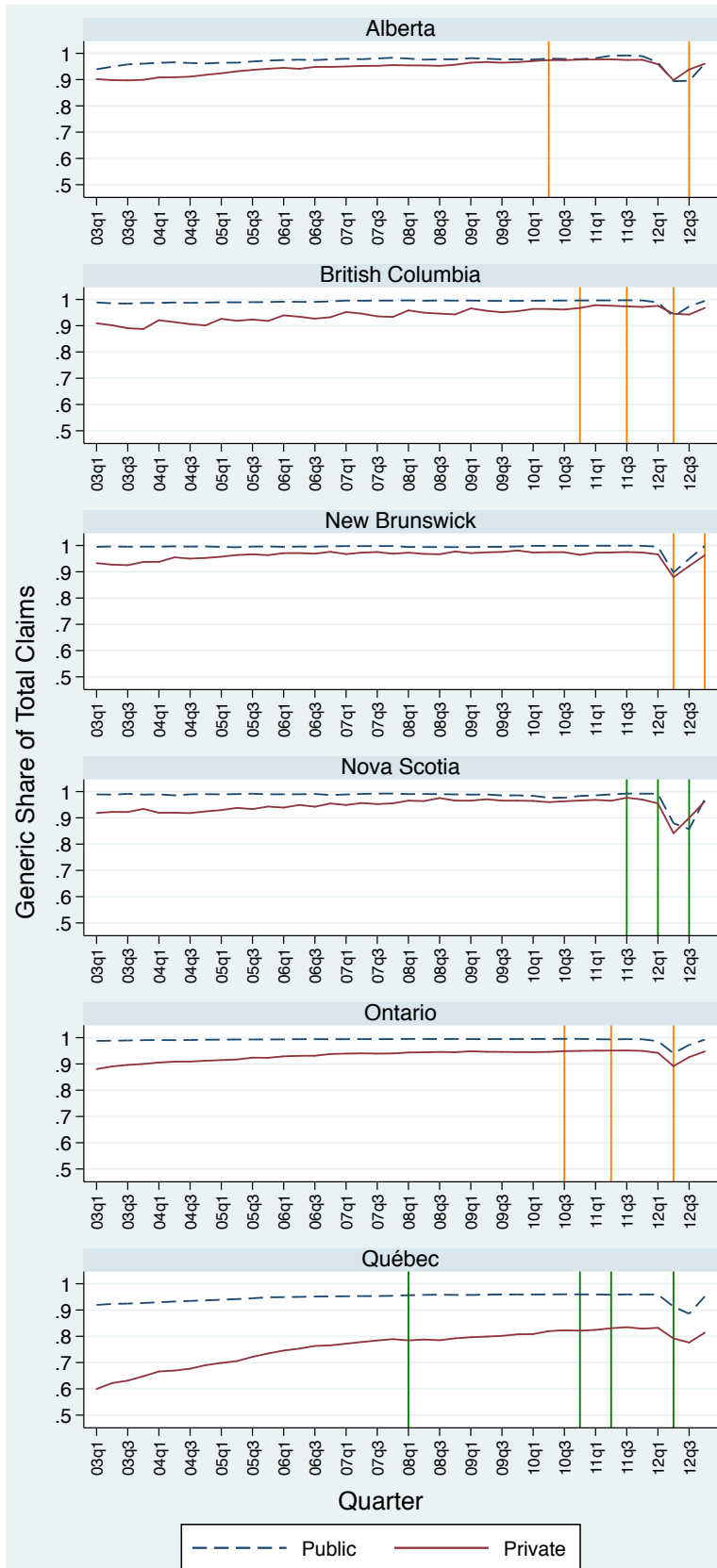




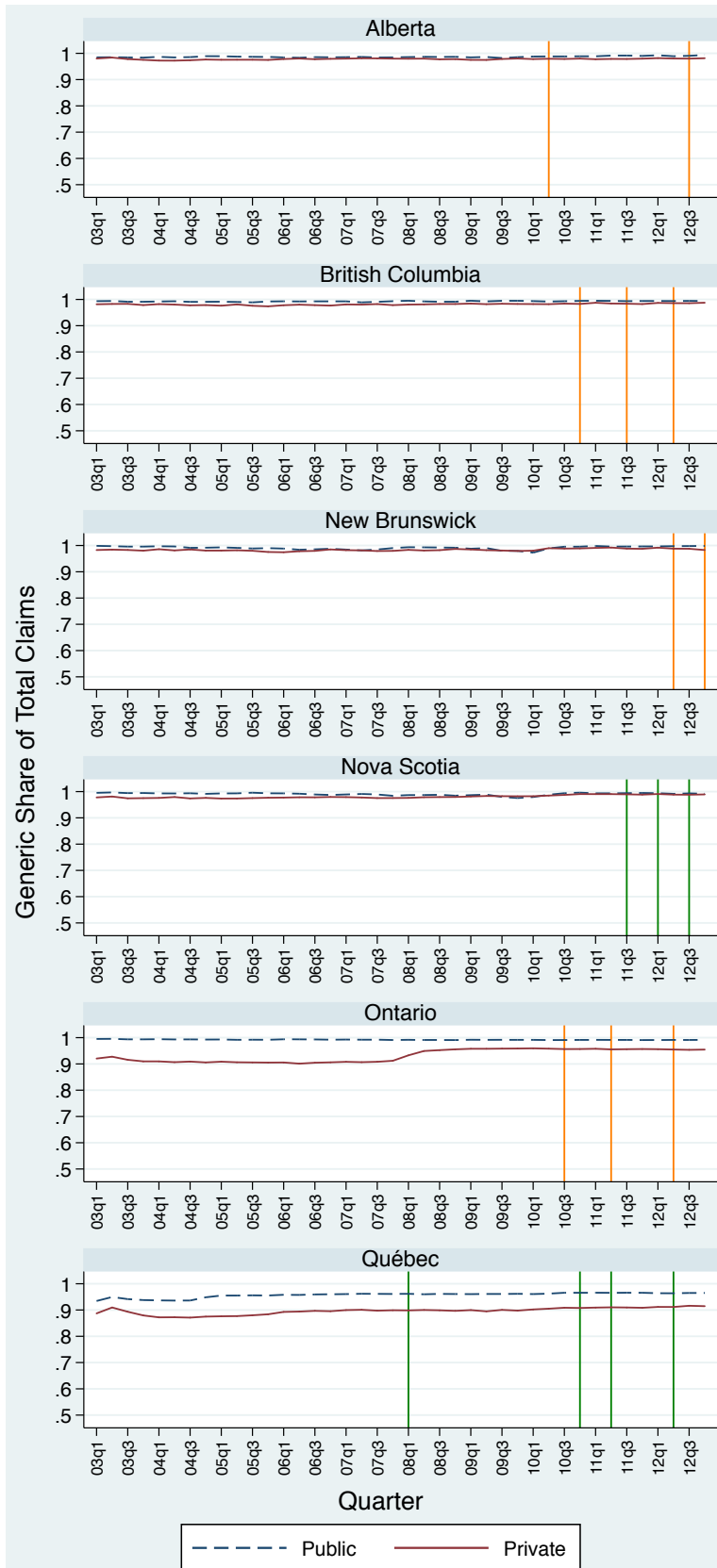




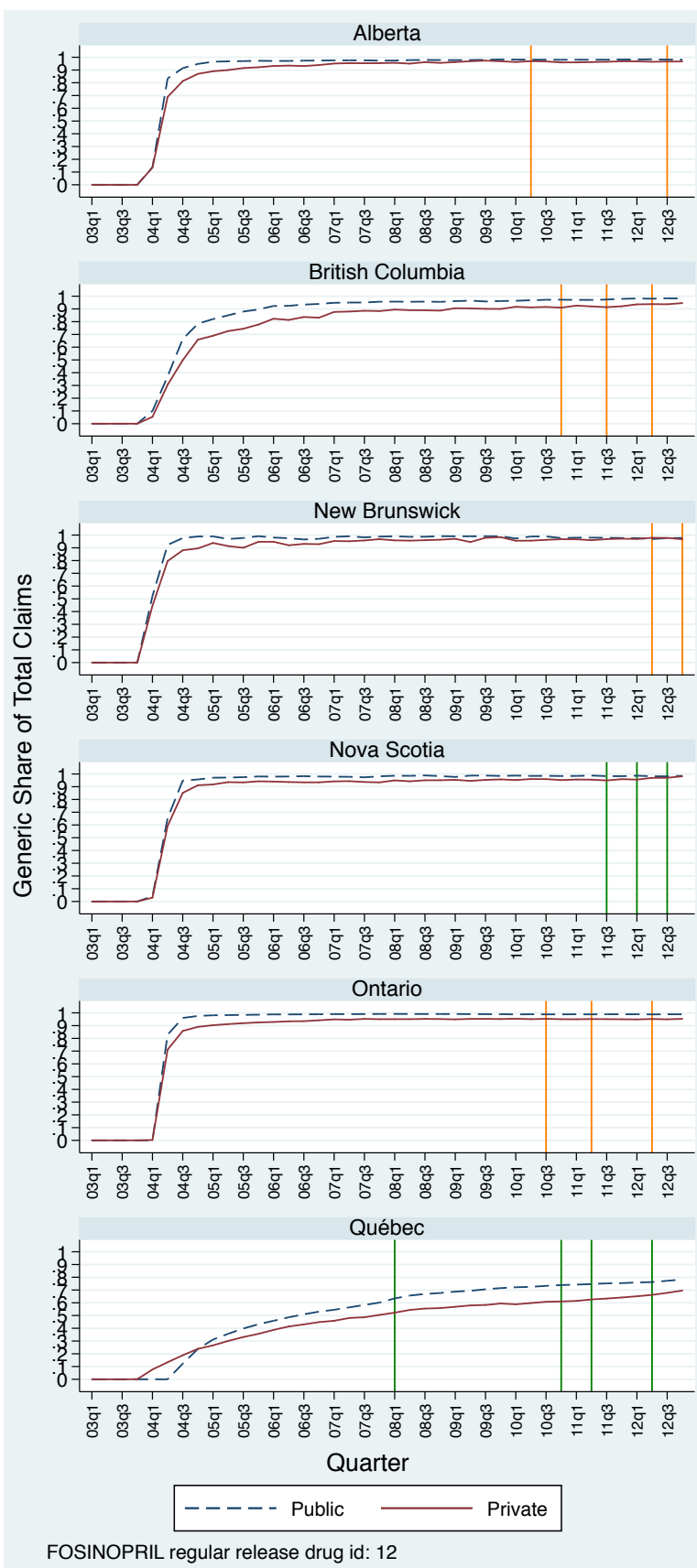


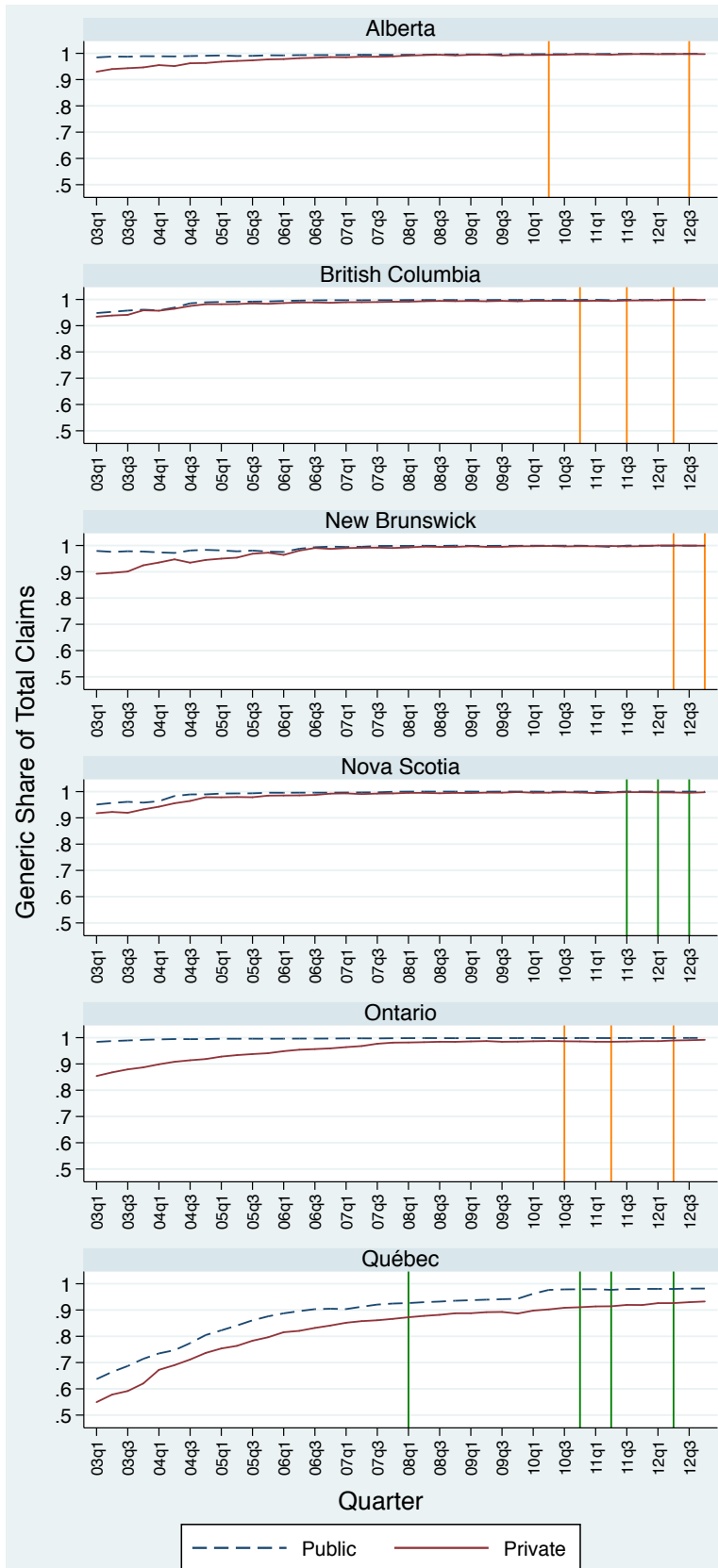


DIVALPROEX delayed release drug id: 10

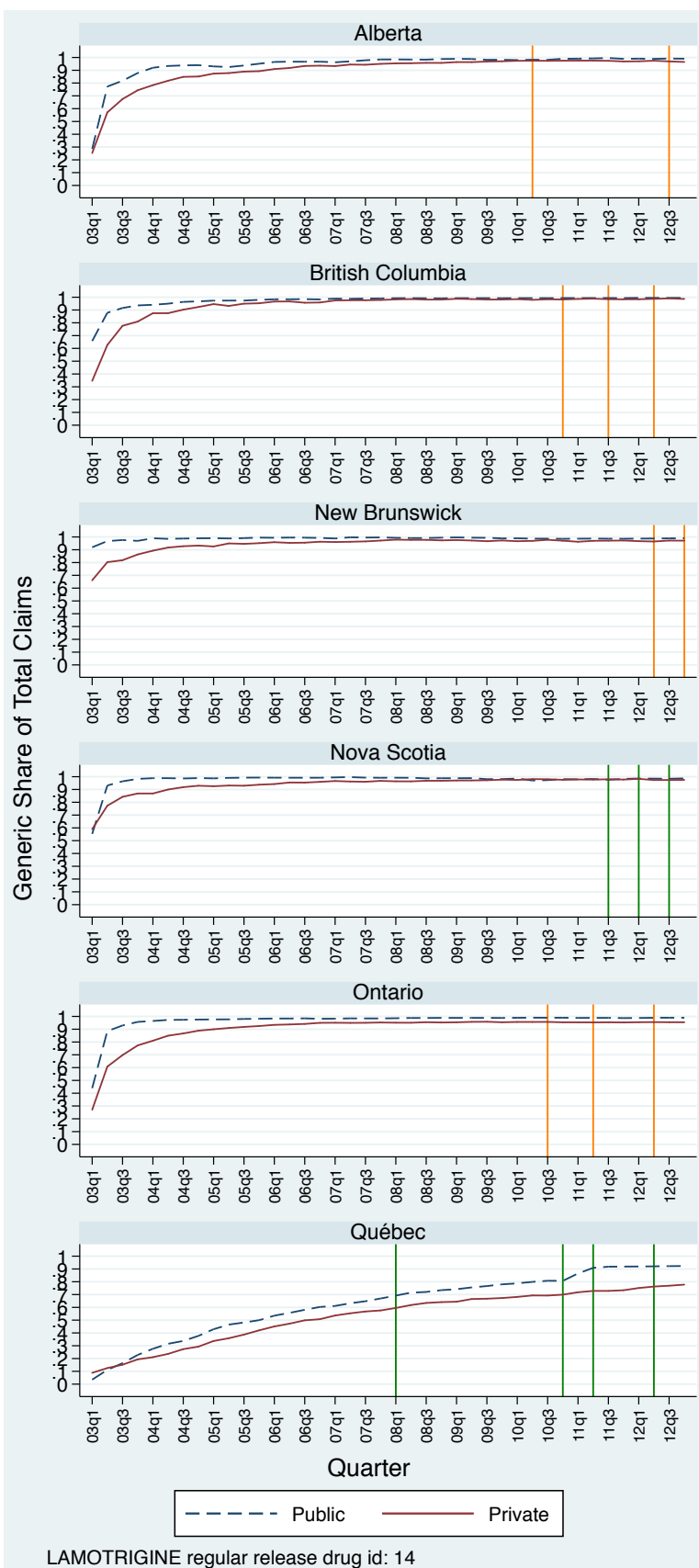


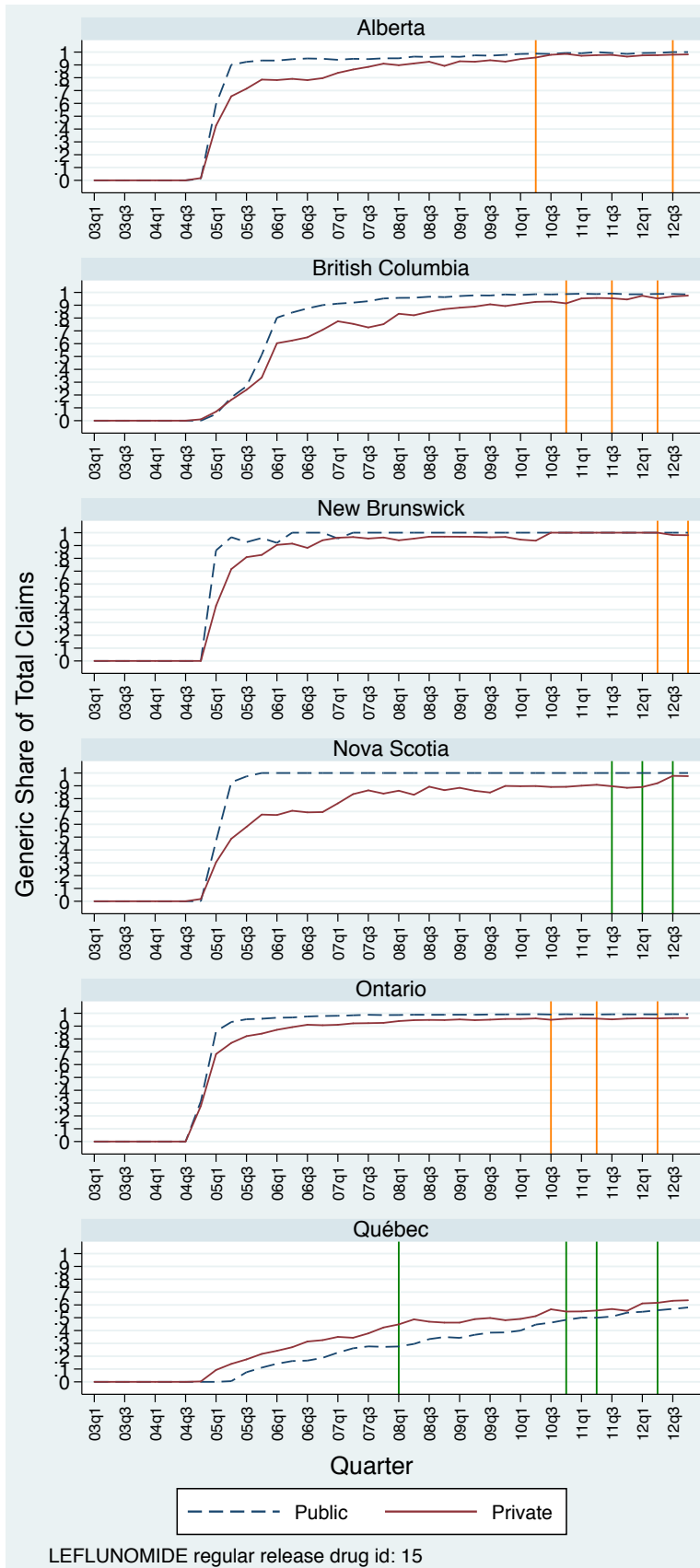
FLUOXETINE regular release drug id: 11

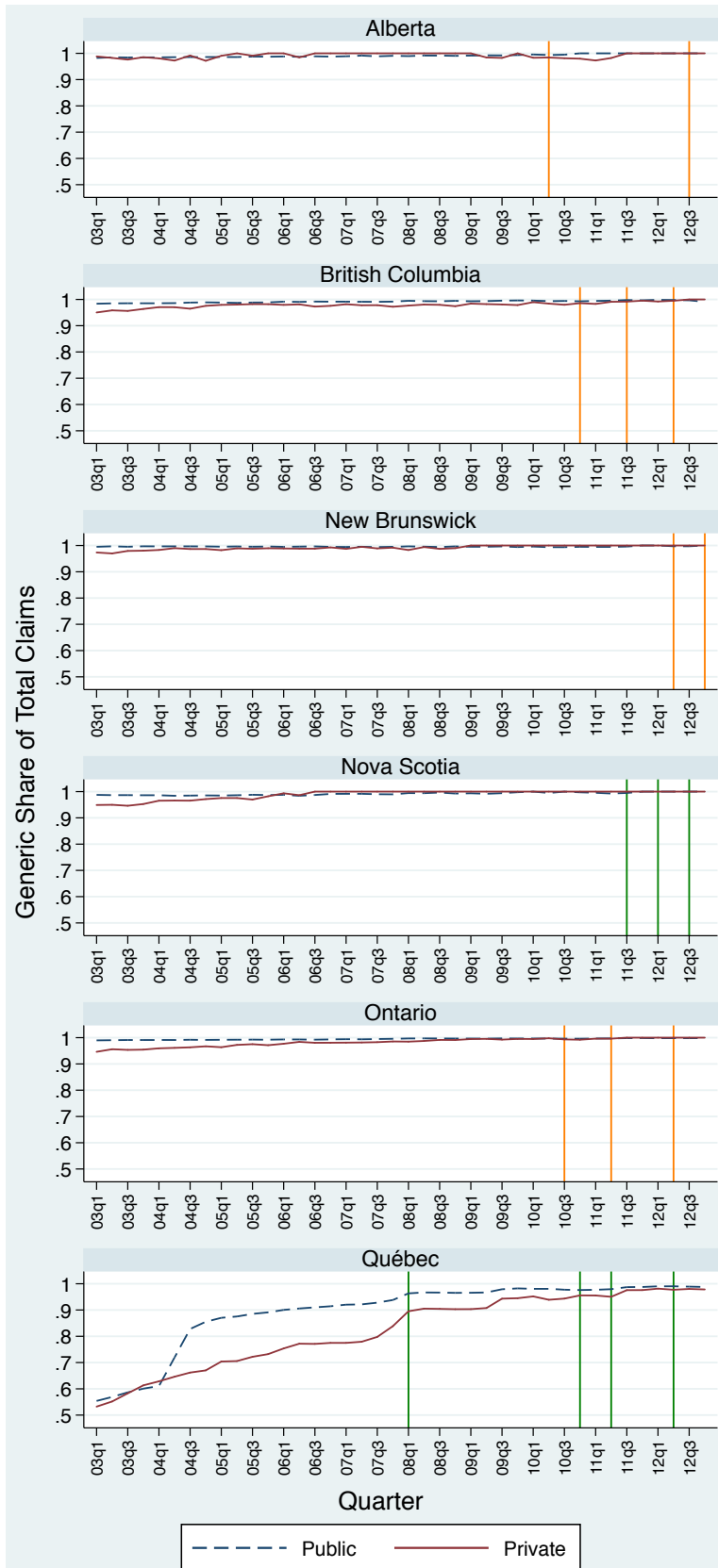


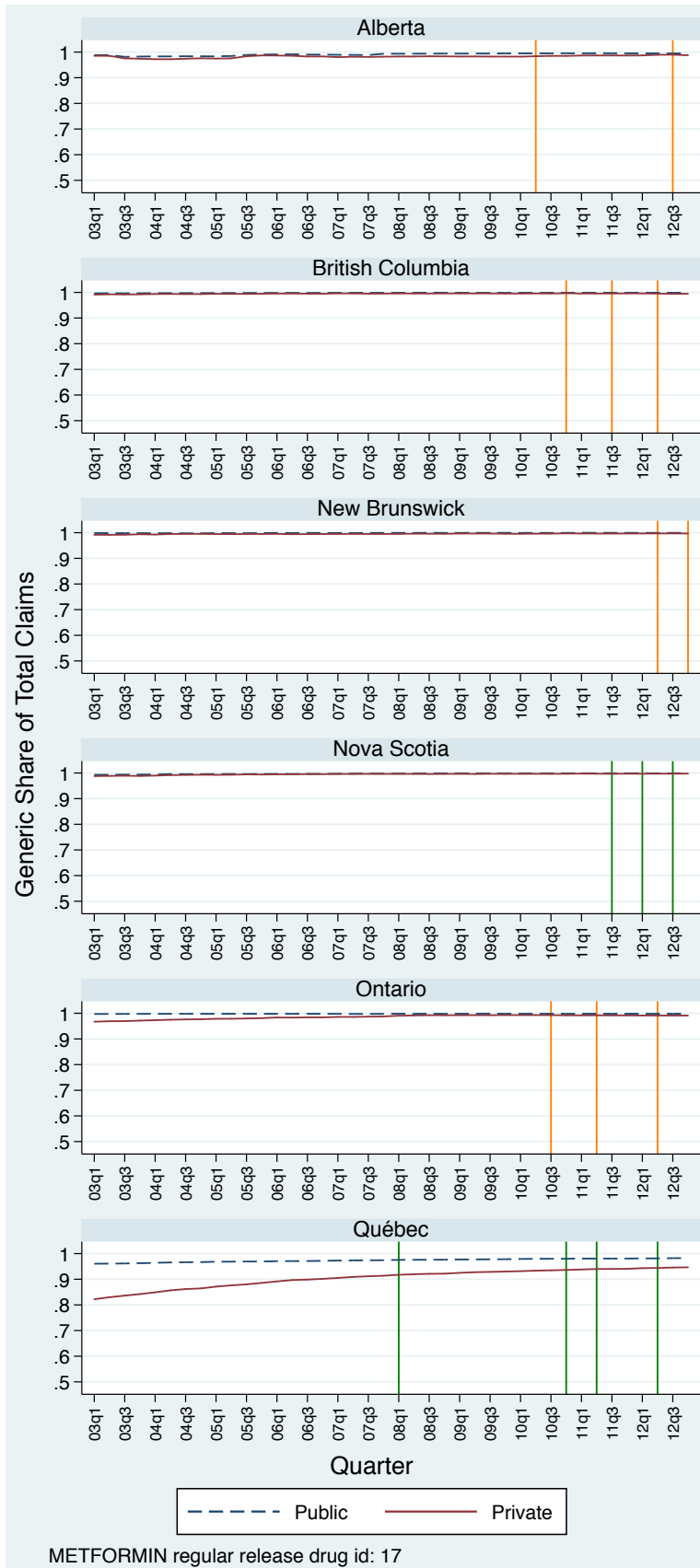


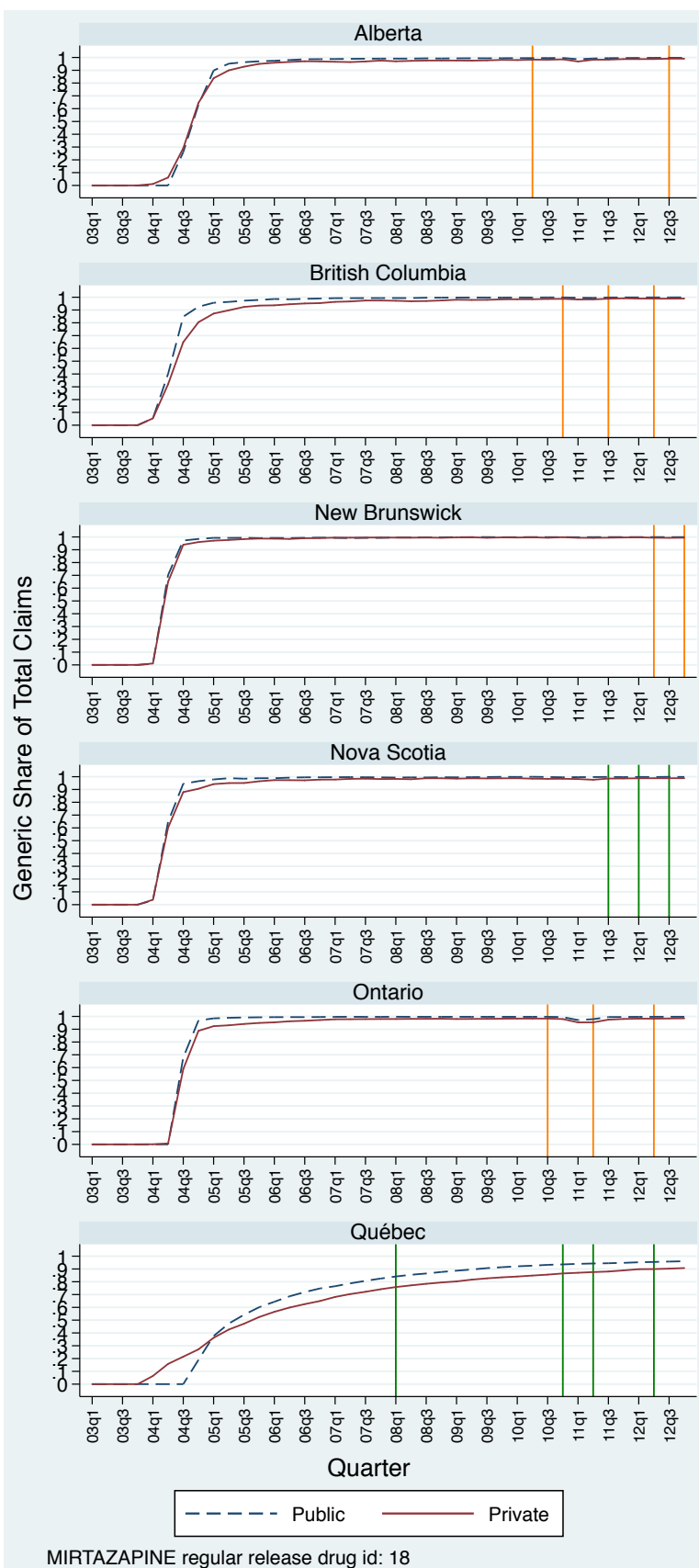
GABAPENTIN regular release drug id: 13

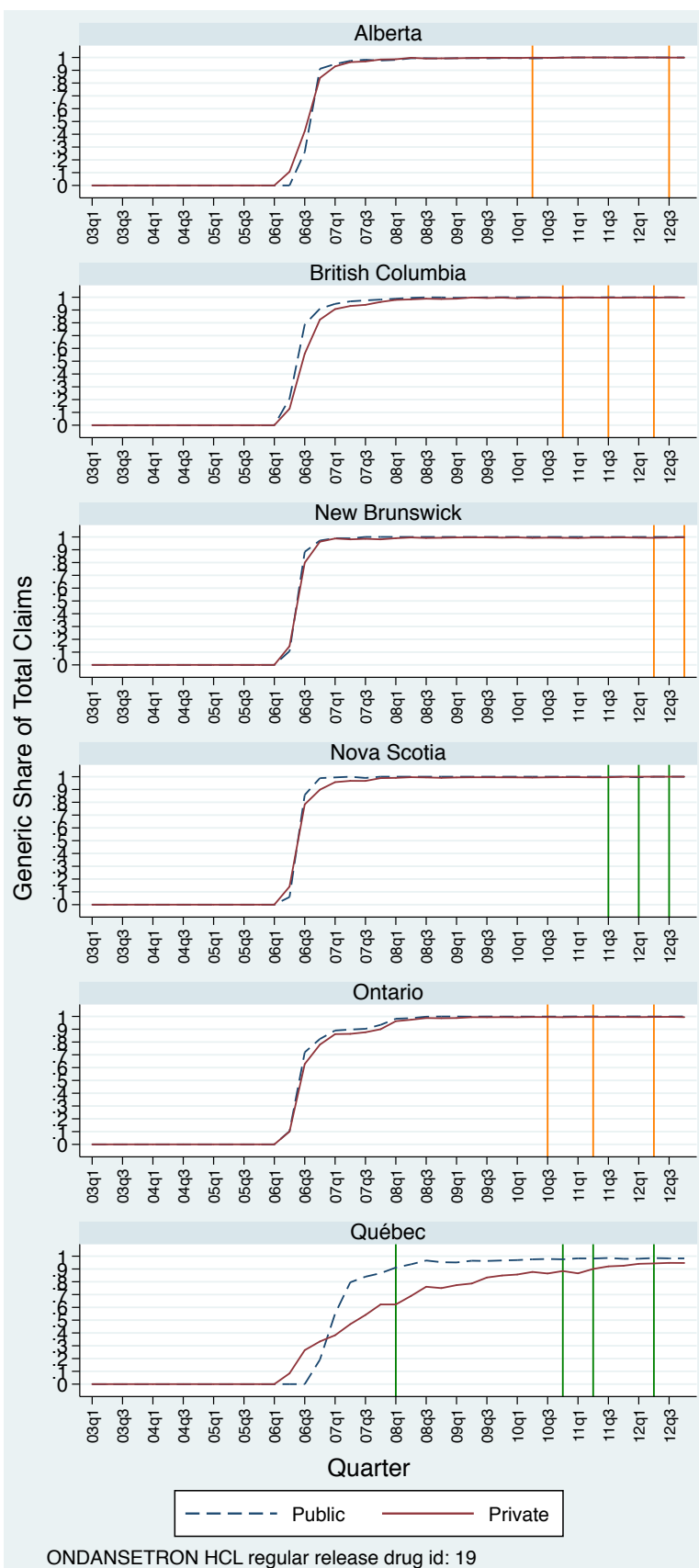


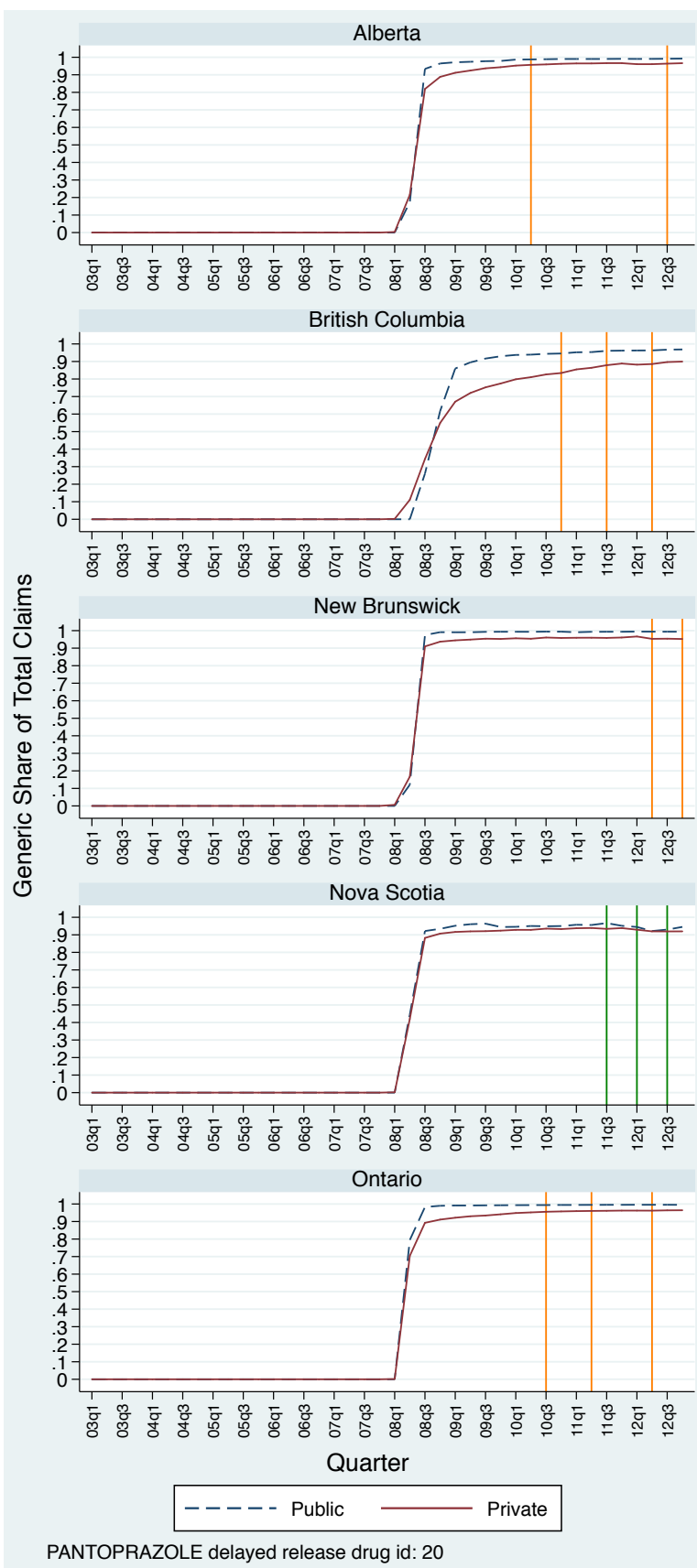


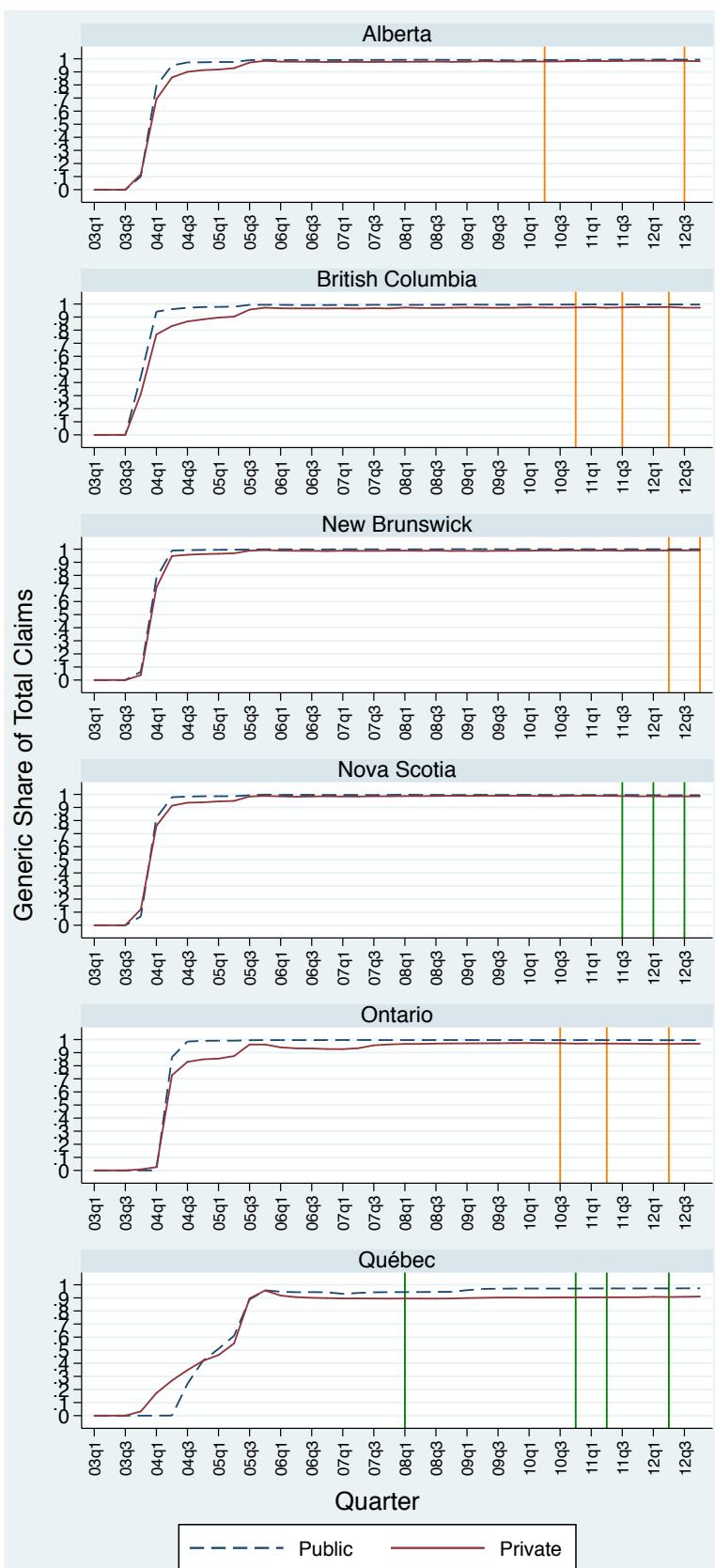




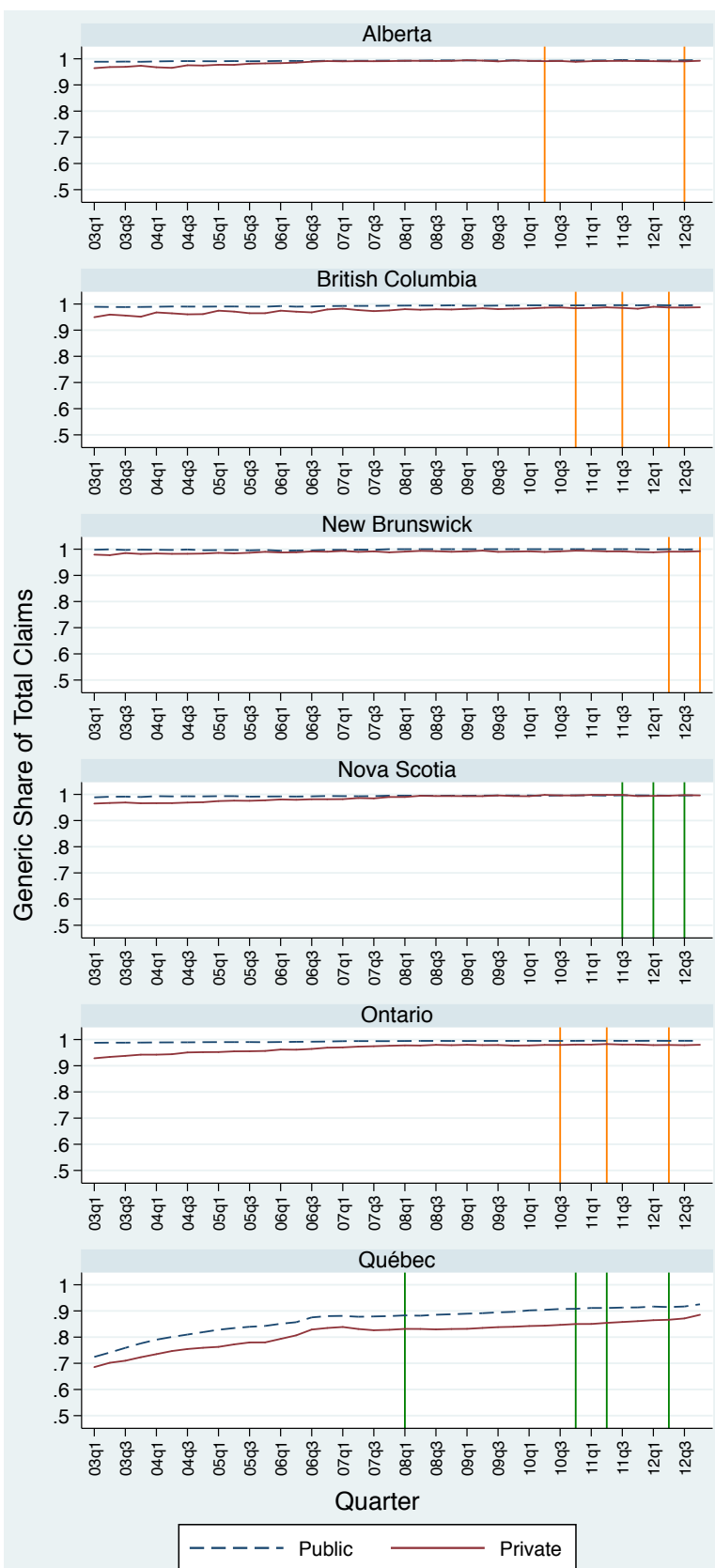




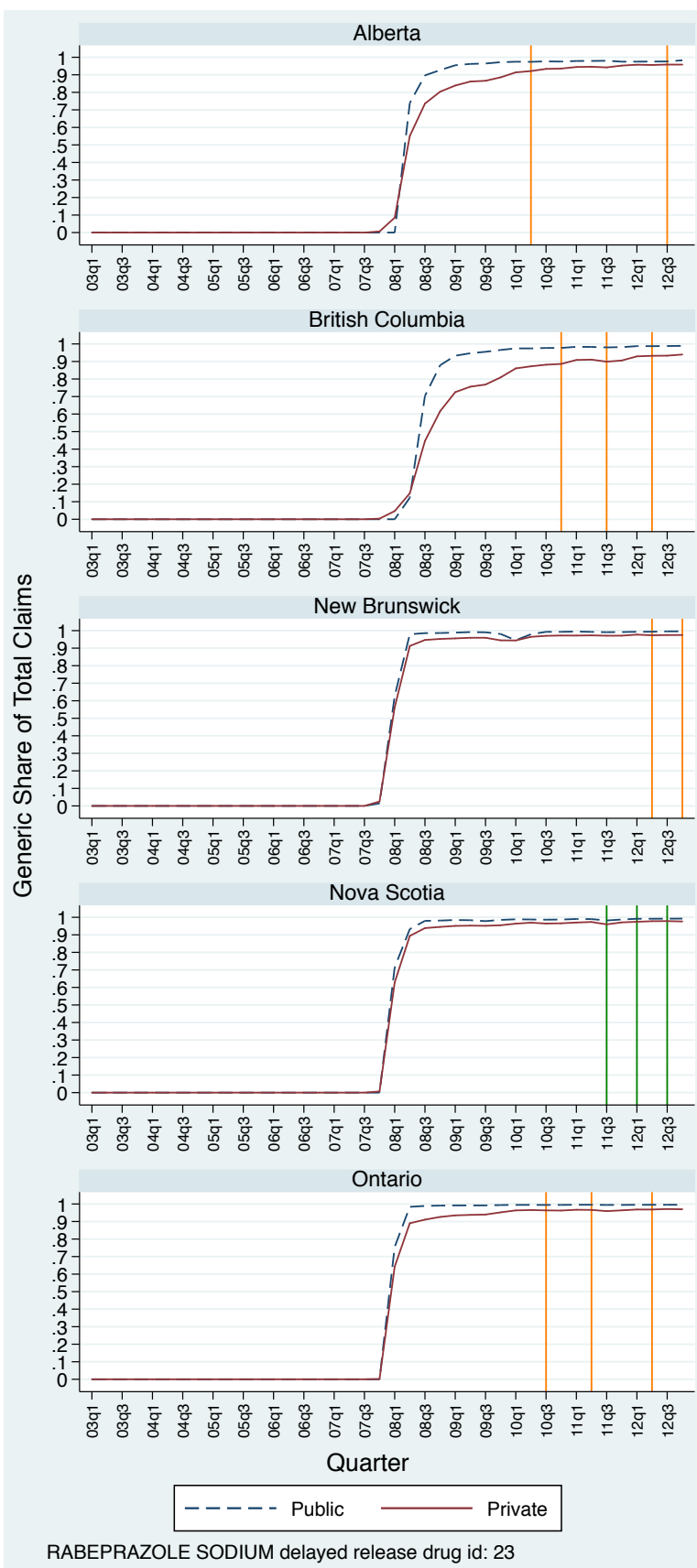


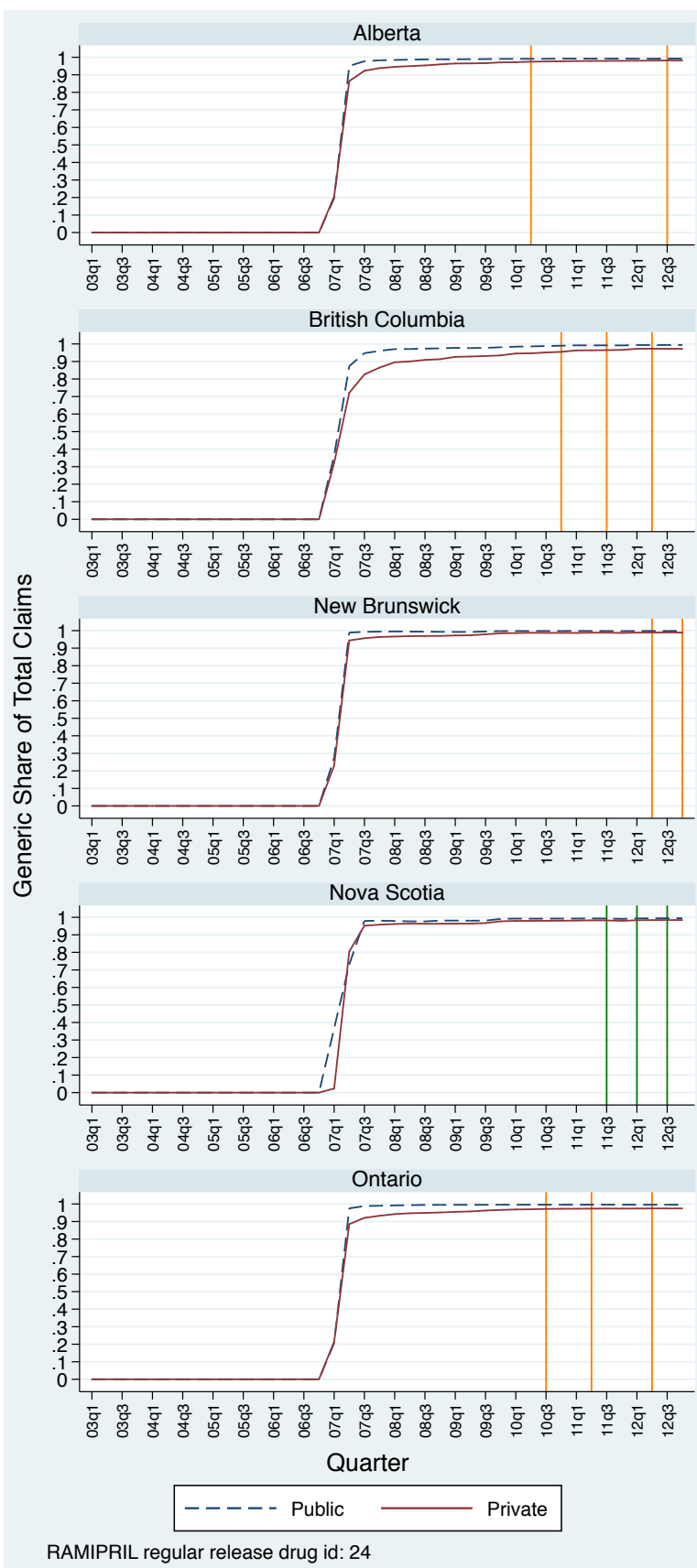


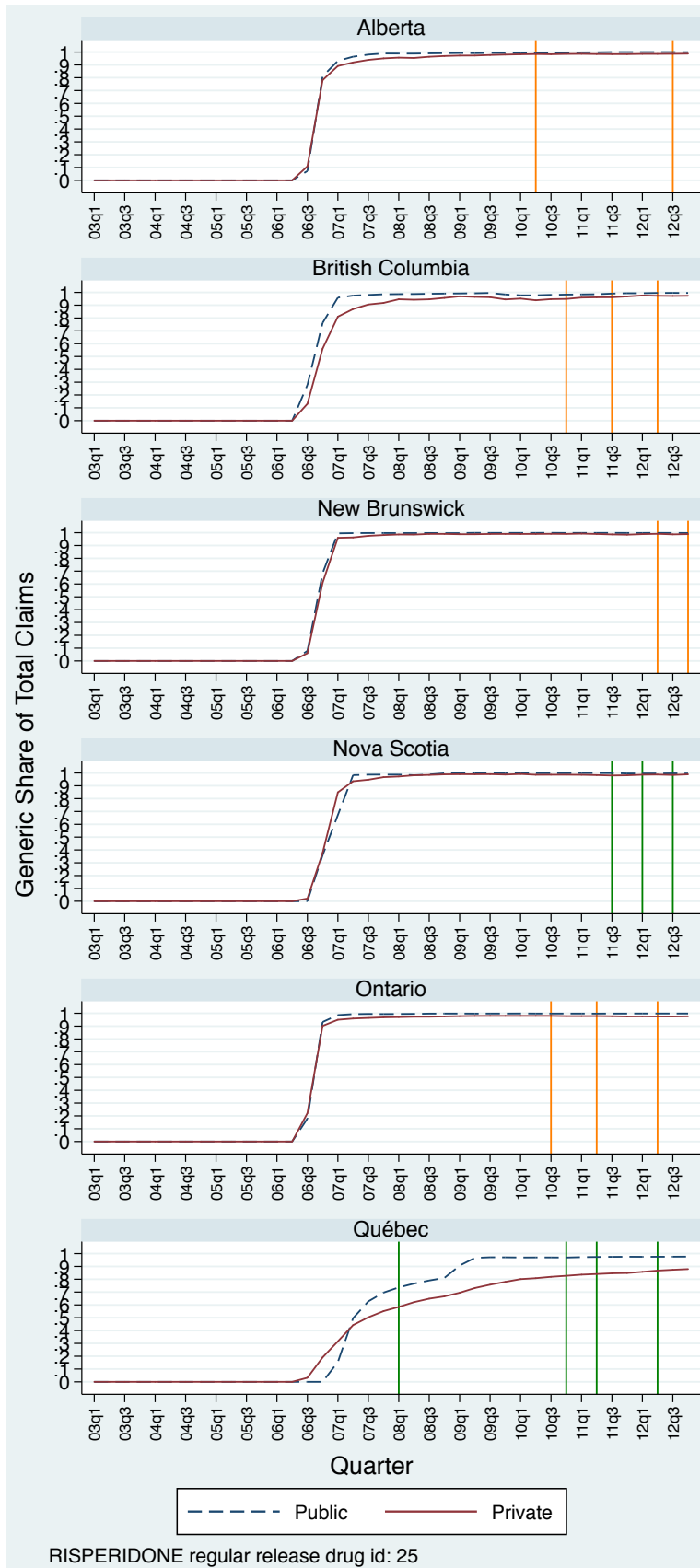
PAROXETINE regular release drug id: 21

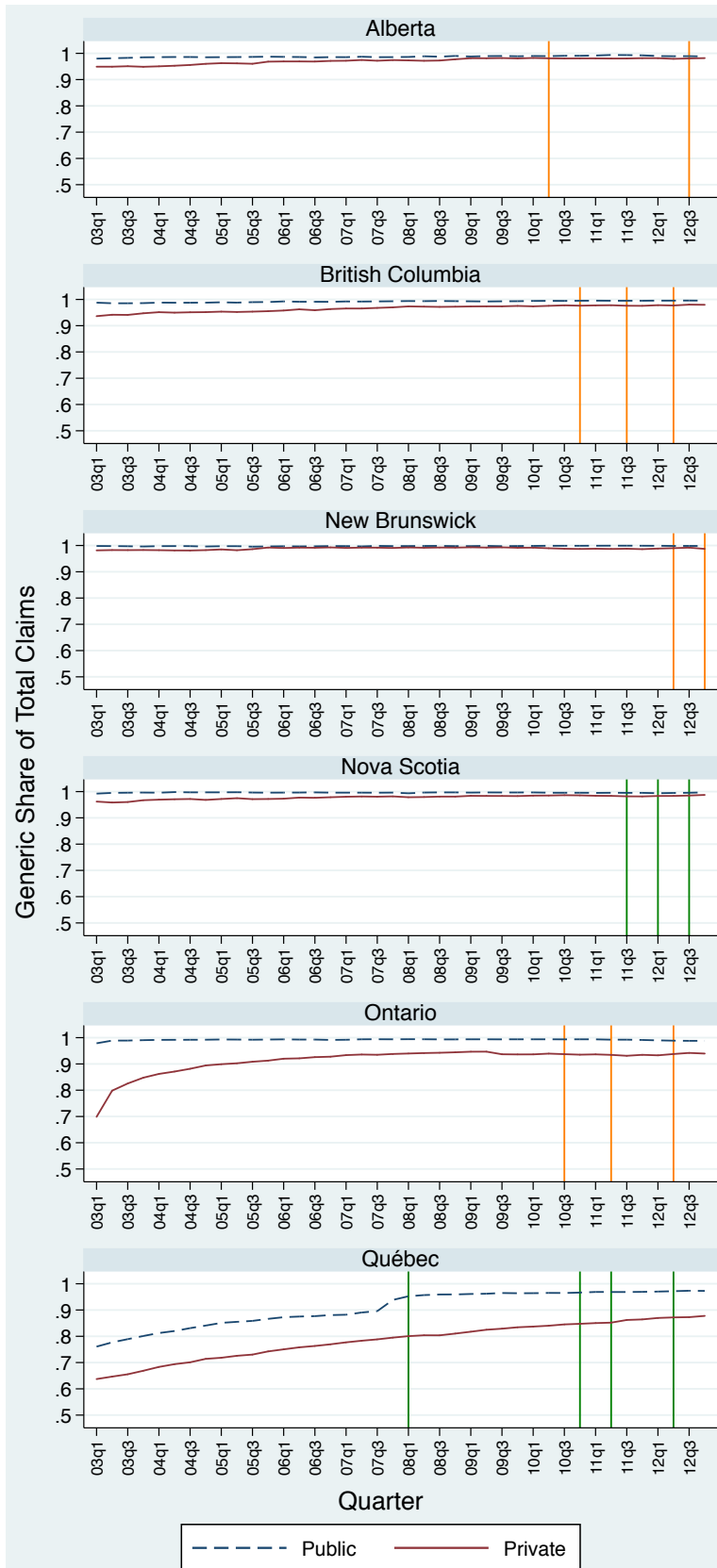


PRAVASTATIN regular release drug id: 22

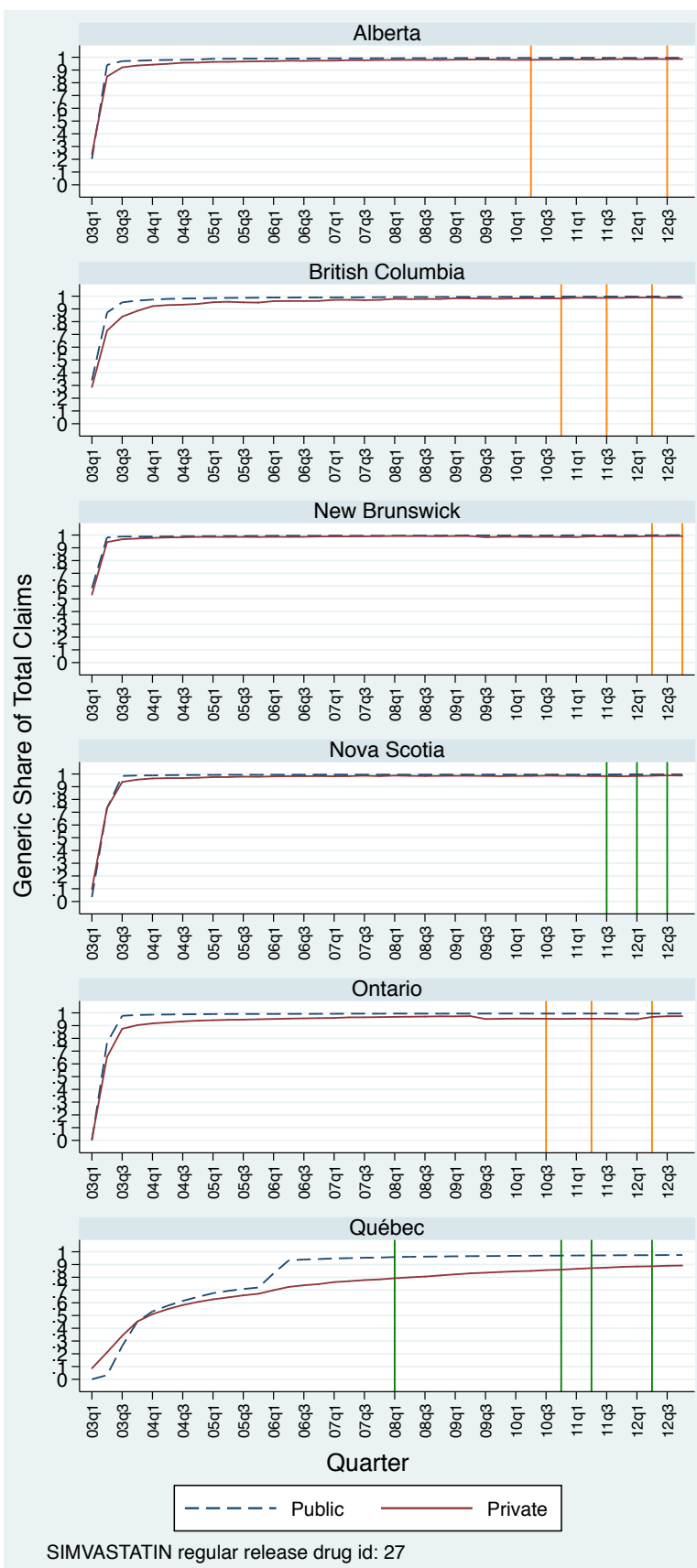


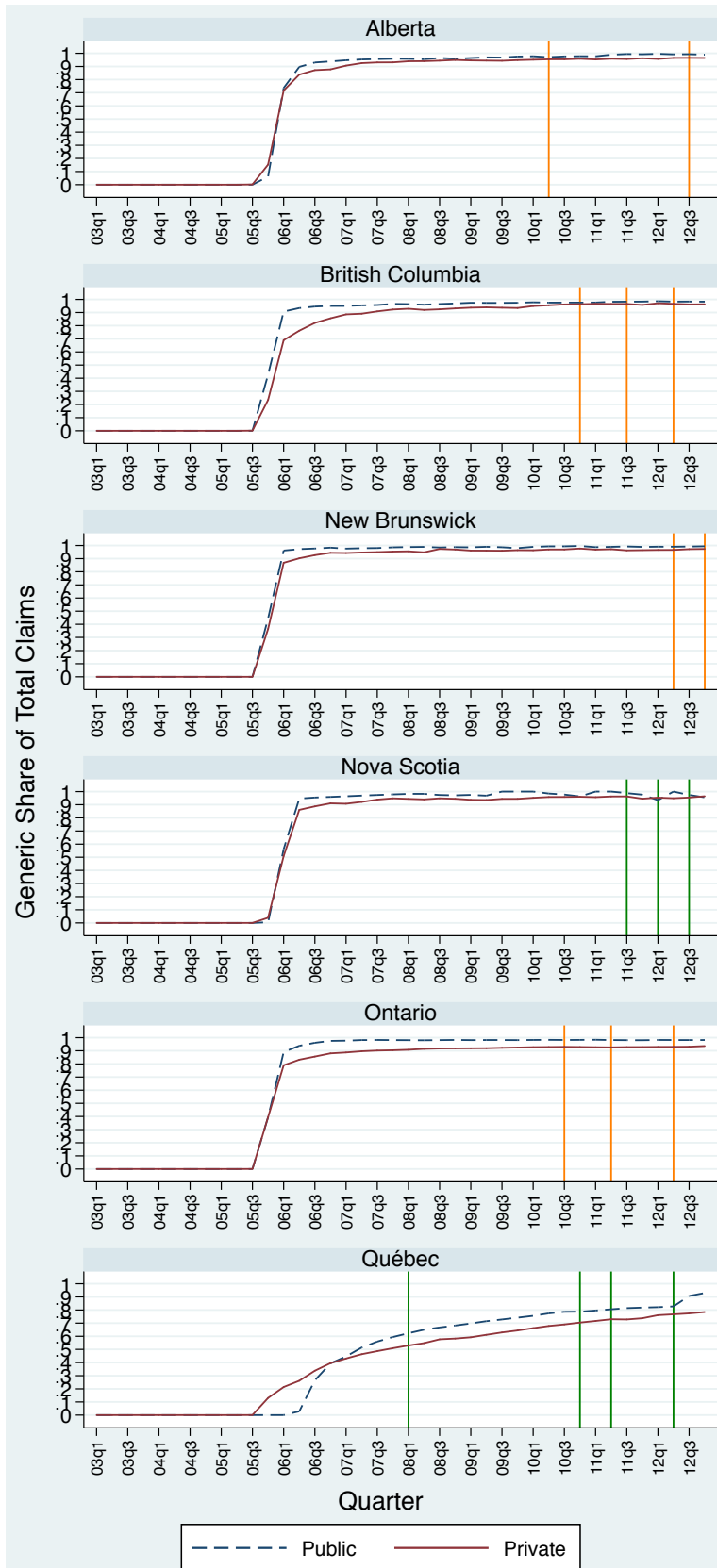




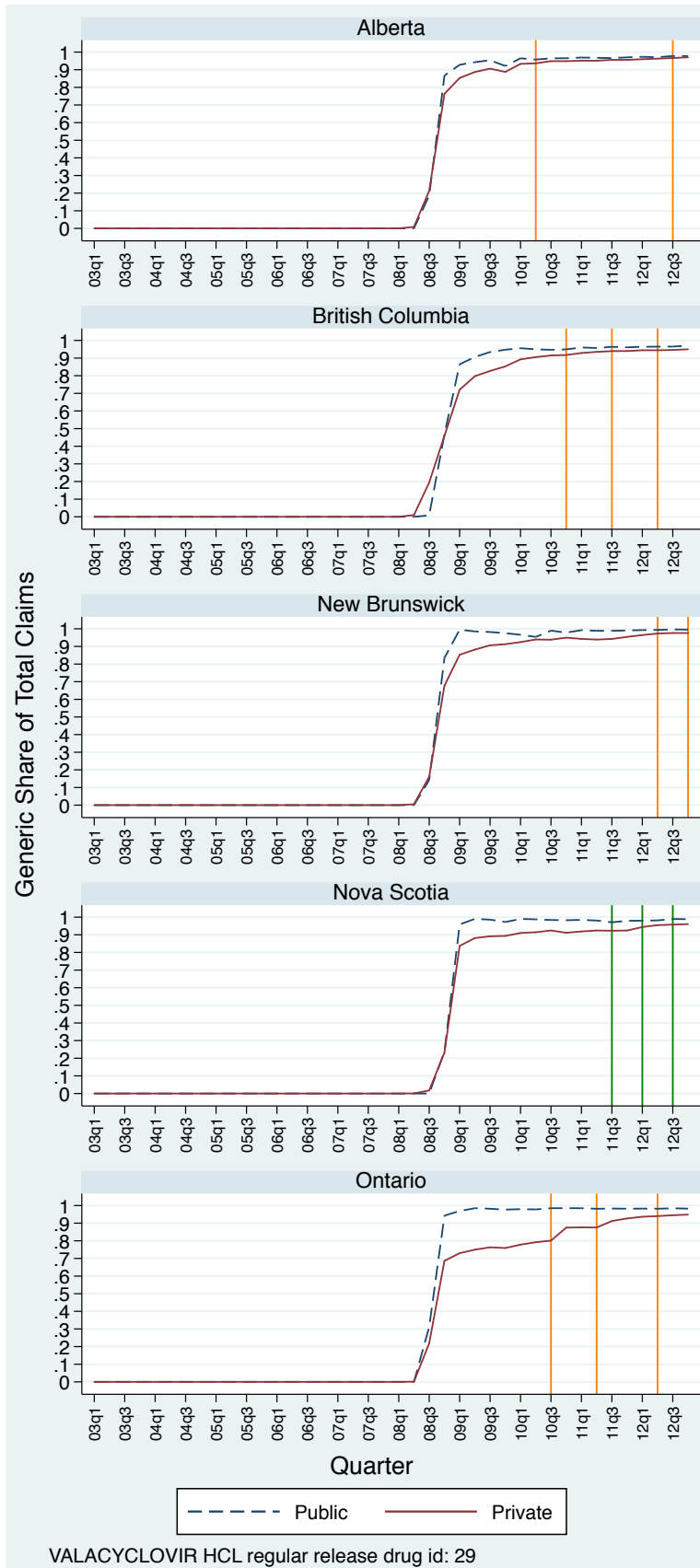


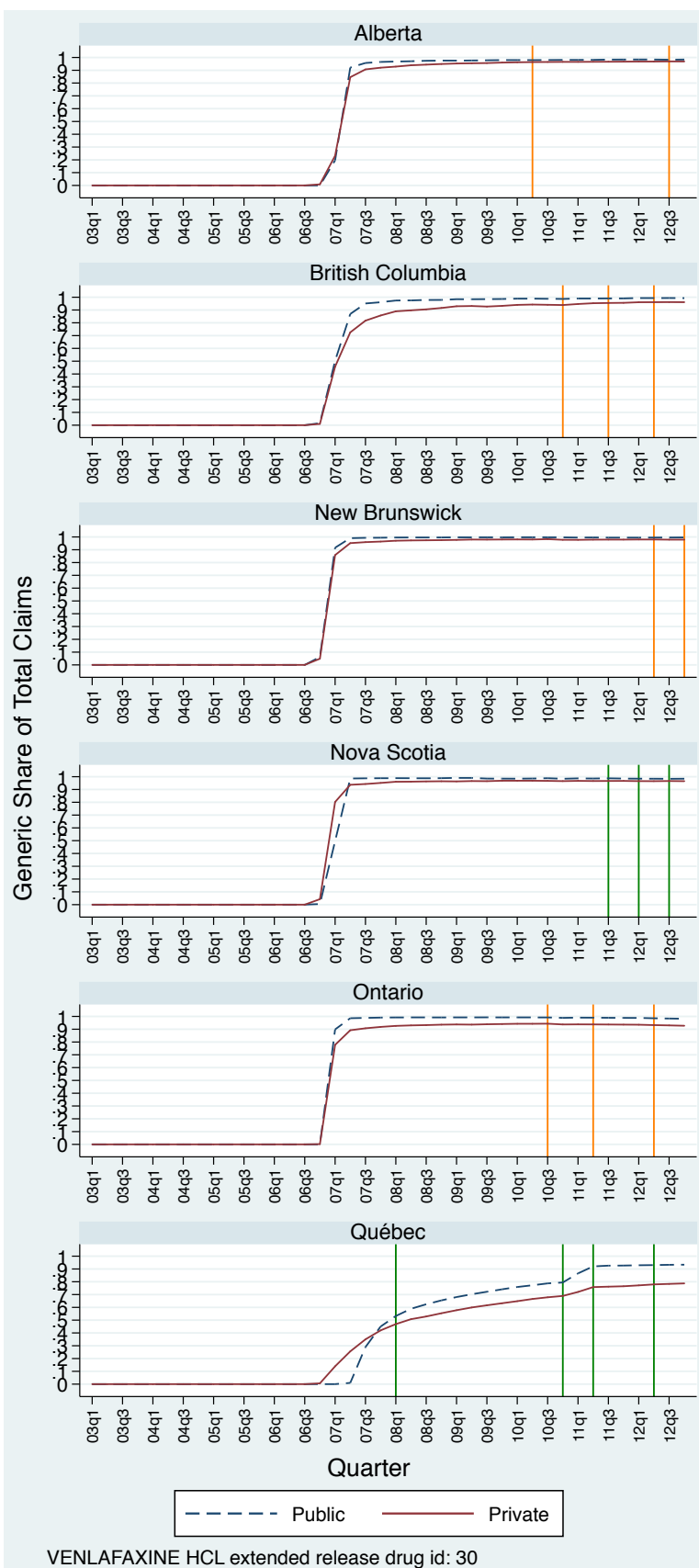
SERTRALINE regular release drug id: 26

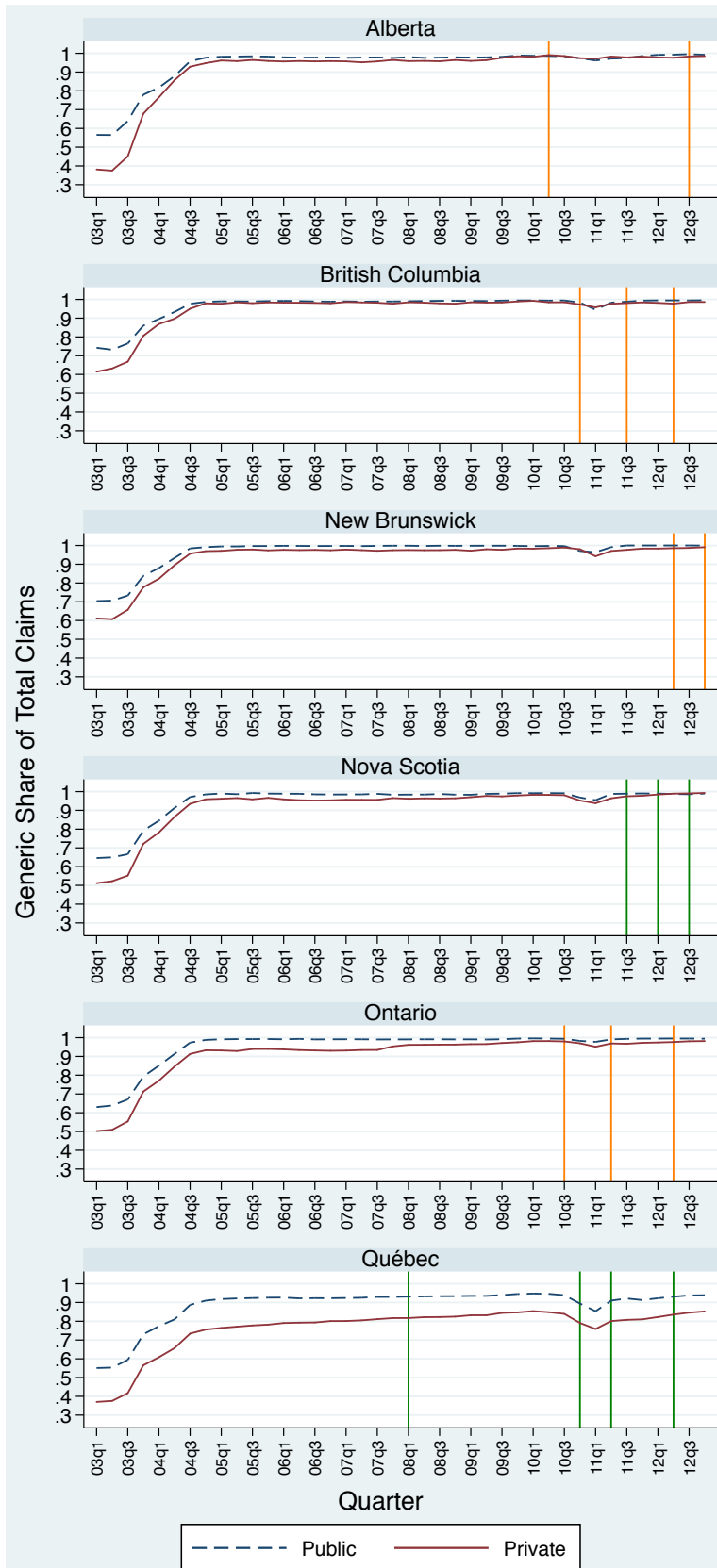




TOPIRAMATE regular release drug id: 28







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