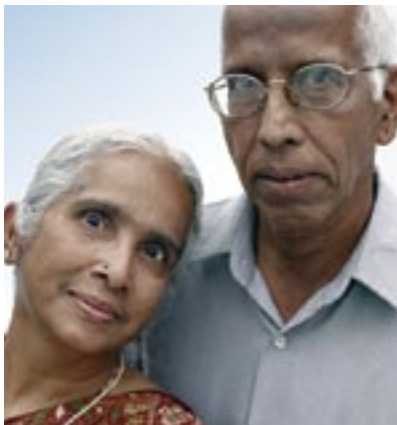




Centre for  
HEALTH SERVICES AND POLICY RESEARCH

# The Canadian Rx Atlas



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The Centre for Health Services and Policy Research (CHSPR) is an independent research centre based at the University of British Columbia. CHSPR's mission is to stimulate scientific enquiry into issues of health in population groups, and ways in which health services can best be organized, funded and delivered. Our researchers carry out a diverse program of applied health services and population health research under this agenda.

CHSPR aims to contribute to the improvement of population health by ensuring our research is relevant to contemporary health policy concerns and by working closely with decision makers to actively translate research findings into policy options. Our researchers are active participants in many policy-making forums and provide advice and assistance to both government and non-government organizations in British Columbia (BC), Canada and abroad.

CHSPR receives core funding from the BC Ministry of Health to support research with a direct role in informing policy decision-making and evaluating health care reform, and to enable the ongoing development of the BC Linked Health Database. Our researchers are also funded by competitive external grants from provincial, national, and international funding agencies.

Much of CHSPR's research is made possible through the BC Linked Health Database, a valuable resource of data relating to the encounters of BC residents with various health care and other systems in the province. These data are used in an anonymized form for applied health services and population health research deemed to be in the public interest.

CHSPR has developed strict policies and procedures to protect the confidentiality and security of these data holdings and fully complies with all legislative acts governing the protection and use of sensitive information. CHSPR has over 30 years of experience in handling data from the BC Ministry of Health and other professional bodies, and acts as the access point for researchers wishing to use these data for research in the public interest.

For more information about CHSPR, please visit [www.chspr.ubc.ca](http://www.chspr.ubc.ca)

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Several staff at the Centre for Health Services and Policy Research assisted in the preparation of this report, including Allyson MacDonald, Chris Balma, Patricia Caetano, and Gillian Hanley.

## Expenditure Levels, Variations, and Trends

Canadians will spend over \$20 billion on prescription drugs in 2006. This is more than is spent on all physicians in Canada, and more than half of what is spent on all hospital care in the country. Yet spending per capita on prescription drugs varies by over 50% across provincial populations.

Growth in prescription drug expenditure has been faster in the past eight years than in any other period in the history of the modern pharmaceutical industry. The prominence of pharmaceuticals in the health care system (and health care budgets) has risen with the increased availability of medicines and with changes in drug marketing practices to promote the widening range of treatments.

The levels, variations, and trends in prescription drug expenditures raise important questions:

- What medicines account for most of the spending?
- Is there overuse or underuse in some provinces?
- Do some regions pay more for similar treatments?
- What drives trends in spending across Canada?
- Is spending ‘under control’ in any province?

Despite the importance to Canadians’ health and their health care system, surprisingly little information is systematically collected and assessed to provide answers to these questions at a pan-Canadian level.

## The Rx Atlas: Providing New Information

Population-based and patient-specific drug information systems—such as the BC PharmaNet system—could be used to address the full spectrum of questions above. Until these data systems are established, health care policy and practice can be informed by the analysis of market-level data.

This Rx Atlas provides the first-ever national portrait of overall (private and public) drug utilization and expenditure. We use Canadian CompuScript data from IMS

Health, Canada Inc. to quantify and illustrate aggregate levels, variations, and trends in Canada’s retail expenditure on prescription drugs from 1998 to 2004.

The focus of this Rx Atlas is total retail expenditure combining both private and public costs. To ensure accurate measures of consumption, our analysis is restricted to oral solid drugs (e.g., “pills”). This excludes items such as liquids, creams, injectables, and inhaled drugs, but accounts for over 80% of retail expenditure on prescriptions in all provinces.

The magnitude and causes of expenditure levels and trends are quantified for Canada as a whole and for all provinces. Separate analyses are conducted for each of the top ten drug categories based on expenditure in 2004.

The purpose of this Rx Atlas is to provide policy makers, researchers, and the public with the best available evidence about drug utilization, pricing, and expenditure dynamics. With the exception of cases of clear policy impact, we do not analyse policy implications of the findings. Instead, we hope that this Rx Atlas provides a guide for those policy makers, practitioners, and researchers best placed to determine which of the illustrated dynamics are worthy of further investigation and potential policy intervention.

## Potential Drivers of Expenditure

Pharmaceutical expenditure variations and trends could derive from the amount of drug consumed. Trends and variations in drug utilization could be driven by population age, medical needs, patterns of health care provision, or access to medicines. If drug utilization for comparable needs varies erratically, policy might aim to ensure access for under-served populations or to manage use among over-served populations.

Trends and variations in expenditure may arise from the cost of drugs used to treat comparable needs. The type of drugs chosen to treat a given illness can affect

the cost of therapy, the quality of therapy, or both. When product selection does not improve outcomes, the choice of high cost options may be interpreted as a form of price inflation. Terms of drug coverage are a common tool used to manage this cost-driver.

Finally, expenditure variations and trends may also derive from the price charged for a given product or from the availability of generic versions of a specific product. Patent laws, pricing policy, and generic availability influence these potential cost-drivers.

## Key Findings

In 2004, Canadians spent approximately \$420 per capita on retail purchases of oral solid prescription drugs. This amounted to over \$13 billion, or 80% of the total retail prescription drug expenditure (including liquids, creams, injected and inhaled drugs).

In descending order of spending in 2004, the top ten oral solid drug categories were as follows: cardiovasculars, psychotherapeutics, cholesterol agents, gastrointestinal drugs, systemic anti-infectives, anti-arthritis, analgesics, neurologicals, hormones, and diabetes therapies.

The top three therapeutic categories accounted for 54% of total spending in 2004. The top five categories accounted for 68% and the top ten categories accounted for 84%.

Expenditure per capita varied considerably across provinces. In 2004, per capita expenditure in the provinces varied by \$174 or 56%, from \$312 in Saskatchewan to \$486 in New Brunswick.

Variations in per capita drug spending across the provinces were primarily the result of variation in the volume of drugs consumed. Some of the variation in use may be explained by differences in the age of the provincial populations.

Differences in the cost of drugs selected also contributed to provincial variation in drug expenditure. Some provinces selected products that were, on average, 4% less expensive than products selected in other provinces.

Drug prices did not vary considerably across Canada. The price differences that were observed in this study appear to be the result of different levels of dispensing fees paid per unit of drug consumed.

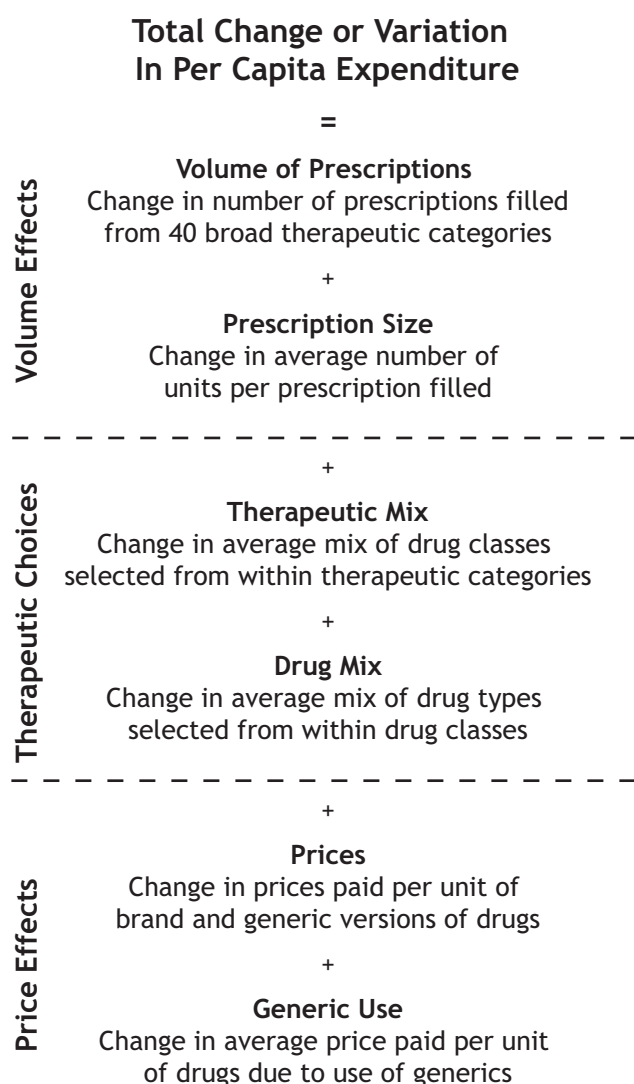
For Canada as a whole, per capita expenditure on oral solid prescription drugs nearly doubled between 1998 and 2004: from \$213 to \$420. Rates of overall expenditure growth were far more comparable across provinces than were the levels of expenditure.

Trends in drug expenditure were driven by a combination of increased utilization of medicines and the selection of increasingly costly treatment options. The average price paid for drugs tended to fall over time due to the increased availability and use of generics.

## Data

The Canadian CompuScript Audit is based on data collected from more than 2,100 retail pharmacies (approximately 30% of the Canadian market) stratified by province. IMS Health projects these sample data to the entire population in each province except for Prince Edward Island and Newfoundland and Labrador (which are combined due to small population sizes).

**Figure 1: Conceptual framework**



The data used in this Rx Atlas describe the volume of prescriptions, dollars, and units of drugs purchased from 1998 to 2004. The data contain information about 5,287 brand and generic versions of 1,508 drugs identified by active ingredient and dosage. IMS grouped these drugs into 185 mutually exclusive drug classes, such as statins and proton pump inhibitors. Drug classes are further aggregated into 40 broad treatment categories, the 10 largest of which are studied in detail.

Cost data include dispensing fees and retail mark-ups. Prices reported here are therefore affected in part by the length of prescriptions in each region. The unit cost of a drug will be lower when prescriptions are longer, resulting in lower per unit dispensing fees.

## Conceptual Framework

The conceptual framework used in this Rx Atlas takes advantage of the therapeutic classifications in the IMS Health data to illustrate six different types of utilization and price dynamics in the Canadian pharmaceutical sector. These six “determinants of expenditure” fall into three broad categories of cost-drivers: Volume Effects, Therapeutic Choices, and Price Effects. This is illustrated in Figure 1.

## Volume Effects

Volume Effects are factors that relate to the absolute volume of prescription drug therapy received by a population. This includes “Volume of Prescriptions,” which is the per capita volume of prescriptions received from broad categories of treatment. It also includes average “Prescription Size,” which may compound or counteract the cost-impact of changes in the number of prescriptions dispensed. Trends or variations may, for example, reflect the use of fewer but longer prescriptions over time or in one region.

Differences or changes in the volume of therapy used by a population are not necessarily a cause for concern if driven by needs. Analysis of utilization trends

or regional variations may, however, indicate areas deserving of detailed investigation if there is potential for underuse, overuse, or misuse.

## Therapeutic Choices

Therapeutic Choices are factors that influence the cost of therapy through the selection of the type or form of drug per course of treatment. Therapeutic choices include the mix of drug classes from which drugs are prescribed and the types of drugs selected within drug classes. These choices may change over time or vary across regions.

Broad therapeutic choices are referred to as “Therapeutic Mix,” and reflect the cost-impact of decisions concerning the drug classes from which prescriptions are written. This includes such dynamics as variation (over time or across regions) in the use of angiotensin II receptor blockers within the therapeutic category of cardiovascular drugs.

Narrow therapeutic choices are referred to as “Drug Mix.” This cost-dynamic reflects the selection of specific drug types within a particular drug class: e.g., variation (over time or across regions) in the use of simvastatin versus atorvastatin within the class of drugs used to treat high cholesterol.

The narrower Drug Mix decisions are less likely to have major effects on health outcomes than broader Therapeutic Mix decisions. Thus, finding that significant expenditure variation (over time or across regions) stems from variation in Drug Mix may provoke prudent policy intervention to steer utilization toward cost-effective choices within a given class of drugs. In contrast, finding that significant expenditure variation (over time or across regions) stems from variation in Therapeutic Mix, without a corresponding health benefit, may provoke policies that focus on educating prescribers and patients about cost-effective treatment choices for a given condition: such as initiating treatment for hypertension with effective and low-cost diuretics.

## Price Effects

Price Effects are factors that influence the cost of therapy received by a population without altering the quantity or type of drug used. This includes the price charged for products already on the market: “Prices.” In this study, such prices are determined in part by the average length of prescription. This is because dispensing fees are included in the cost of medicines tracked in this study.

Price Effects also include the rate at which generic drugs are selected: “Generic Use.” The cost-impact of Generic Use will be influenced by the availability of generic alternatives to brand-name medicines, the relative price of brand and generic versions of a given medicine, and by policies to encourage generic substitution by patients or providers.

Price Effects generally have no impact on the quality of health outcomes obtained per course of therapy. As such, they are common targets for policy intervention.

## Indexes

Figure 1 depicts the conceptual framework in an additive fashion. Although the framework is quantified with economic price and quantity indexes that interact multiplicatively, we have converted these indexes to an additive format using logarithms. Thus, individual cost-drivers add up to the three respective sub-totals, and these sub-totals add up to the total variation observed or total change over time.

## Reference

This Rx Atlas is based on the methods and approach used in Morgan, SG. Drug Expenditure Trends in the Canadian Provinces: Magnitude and Causes from 1998 to 2004. *Healthcare Policy*; 2005 1(1): 85-99.

# Story #1: Overall Variation

Overall Variation in Per Capita Expenditure, 2004 and 1998

## Pattern of Expenditure

The most notable pattern that emerges from this Rx Atlas is the difference in per capita expenditure in Eastern versus Western Canada.

In both 1998 and 2004, per capita expenditure in British Columbia to Manitoba tended to be lower than per capita expenditure in Ontario through to the Atlantic Provinces.

What stands out in particular is the fact that British Columbia and Saskatchewan were well below the national average in both 1998 and 2004, while Quebec, New Brunswick, and Nova Scotia were well above the national average in both years.

Manitoba had been well below the national average in 1998, but rose to exceed the national average in 2004. This may be due to the effects of Internet pharmacy in that province (discussed in Overall Expenditure, Determinants of Change).

The pattern of higher expenditure per capita in Eastern versus Western Canada is relatively consistent across leading drug classes. There were just a few notable exceptions — such as spending on cholesterol drugs, neurologicals, and hormones in Prince Edward Island and Newfoundland and Labrador.

## Source of Differences

On the facing page, the potential sources of differences in expenditure between provinces are broken into the three broad categories of Volume Effects, Therapeutic Choices, and Price Effects.

It is clear that Volume Effects contributed considerably to the pattern of expenditure variation across provinc-

### Percent variation from the mean national level of overall per capita expenditure (all therapeutic categories)

	BC	AB	SK	MB	ON	QC	NB	NS	PE/NL	
Overall	-21%	-5%	-26%	4%	1%	13%	16%	12%	-6%	2004
Cardiovasculars	-23%	-14%	-11%	3%	-1%	16%	13%	21%	3%	
Psychotherapeutics	-1%	4%	-28%	17%	-8%	10%	26%	9%	-6%	
Cholesterol agents	-31%	-21%	-45%	-15%	3%	28%	12%	11%	-14%	
Antispasmodics	-36%	4%	-31%	-12%	7%	5%	28%	38%	4%	
Antiinfectives	-10%	10%	-20%	3%	2%	-5%	11%	11%	25%	
Antiarthritics	-37%	8%	-12%	14%	9%	-3%	37%	10%	-3%	
Analgesics	-5%	29%	-43%	-11%	17%	-30%	5%	-4%	-1%	
Neurologicals	3%	-7%	-16%	14%	-9%	17%	4%	2%	-25%	
Hormones	-28%	-10%	-30%	-20%	0%	34%	-8%	-15%	-37%	
Diabetes therapy	-30%	7%	-23%	7%	-2%	15%	26%	11%	-10%	
Overall	-19%	-10%	-21%	-28%	7%	7%	13%	22%	1%	1998
Cardiovasculars	-25%	-25%	-13%	-28%	8%	11%	13%	30%	12%	
Psychotherapeutics	5%	12%	-24%	-13%	-3%	-1%	19%	20%	-10%	
Cholesterol agents	-32%	-35%	-48%	-41%	11%	30%	-2%	8%	-39%	
Antispasmodics	-28%	-12%	-30%	-39%	21%	-14%	18%	55%	22%	
Antiinfectives	-19%	4%	-11%	-29%	12%	-8%	12%	7%	18%	
Antiarthritics	-34%	-1%	1%	-8%	18%	-13%	26%	16%	6%	
Analgesics	-4%	24%	-47%	-40%	22%	-32%	4%	20%	8%	
Neurologicals	14%	-11%	2%	-9%	-9%	9%	10%	16%	4%	
Hormones	-21%	-7%	-10%	-42%	0%	26%	0%	-11%	-31%	
Diabetes therapy	-25%	-15%	-31%	-33%	-4%	31%	0%	39%	-6%	

es. Provinces in Western Canada tended to consume smaller amounts of the prescription drugs tracked in this study. This is true for the overall pharmaceutical market and for the ten leading therapeutic classes.

Even in anomalous cases of lower-than-average spending in Eastern Canada—such as that found in some categories for Prince Edward Island and Newfoundland and Labrador—the difference is primarily explained by variation in the volume of drug consumed.

Provincial differences in Volume Effects may be explained in part by differences in the average age of provincial populations. Alberta has a younger-than-average population, while Quebec, New Brunswick, and Nova Scotia have older populations.

# Story #1: Overall Variation

Overall Variation in Per Capita Expenditure, 2004 and 1998

It should be noted that a Canadian Institute for Health Information report—“Provincial and Territorial Government Health Expenditure by Age Group, Sex and Major Category” (May 2005)—indicates that age-adjustments will change results by only a few percentage points. British Columbia and Saskatchewan will likely have lower-than-average utilization even after adjusting for differences in population age.

Differences in the costs of Therapeutic Choices and Prices Effects also contributed to variations in expenditure across provinces, but they were smaller than the regional cost-impact of Volume Effects.

Inter-provincial variation in the cost of Therapeutic Choices had a moderate impact on variations in retail spending on oral solid prescription drugs. The effects of Therapeutic Choices on regional variations are notable in certain drug categories—such as psy-

chotherapeutics, gastrointestinal drugs, anti-infectives, analgesics, and diabetes therapies.

There was relatively little systematic variation in the cost of Therapeutic Choices. Eastern and Western provinces are about equally likely to be above or below the national average in the cost of Therapeutic Choices.

Finally, differences in Price Effects caused modest variation in per capita drug expenditure for the market as a whole, as well as for the top 10 therapeutic categories. The most significant outlier in this regard was the category of hormones, where variation in Price Effects was considerable.

Most of the observed price differences likely stem from the amount of dispensing fees paid per unit of drug rather than regional differences in the price of drugs themselves. Further Price Effects stem from variation in the rate of generic drug use when available.

## Percent variation from the mean national level of per capita expenditure for three determinants of variation (all therapeutic categories)

		Volume Effects										Choice Effects										Price Effects									
		BC	AB	SK	MB	ON	QC	NB	NS	PE/NL	BC	AB	SK	MB	ON	QC	NB	NS	PE/NL	BC	AB	SK	MB	ON	QC	NB	NS	PE/NL			
2004	Overall	-11%	-3%	-24%	3%	0%	6%	17%	16%	2%	-5%	2%	-4%	2%	0%	1%	-4%	-5%	-9%	-5%	-4%	1%	-2%	1%	5%	-1%	-2%	1%			
	Cardiovasculars	-14%	-12%	-17%	0%	1%	8%	12%	18%	6%	-4%	2%	1%	3%	0%	0%	-2%	-1%	-6%	-4%	-3%	6%	1%	-2%	6%	0%	-1%	2%			
	Psychotherapeutics	-3%	-5%	-24%	11%	-9%	9%	37%	25%	3%	7%	12%	-4%	8%	-1%	-5%	-12%	-10%	-8%	-5%	-3%	-3%	-3%	1%	6%	-4%	-7%	0%			
	Cholesterol agents	-27%	-17%	-52%	-14%	3%	18%	7%	9%	-15%	1%	0%	-2%	1%	2%	-2%	2%	0%	0%	-4%	-3%	2%	-1%	-1%	5%	1%	-1%	3%			
	Antispasmodics	-15%	-2%	-19%	-6%	7%	-6%	26%	39%	20%	-17%	8%	-13%	1%	-4%	10%	-11%	-16%	-23%	-4%	-2%	1%	-6%	2%	2%	2%	-3%	2%			
	Antiinfectives	1%	18%	3%	17%	3%	-23%	14%	15%	43%	-7%	-3%	-19%	-12%	-5%	18%	-2%	-4%	-15%	-3%	-4%	-4%	-2%	4%	0%	-2%	0%	-4%			
	Antiarthritics	-19%	3%	-8%	12%	8%	-8%	26%	12%	0%	-14%	7%	-5%	1%	-2%	2%	1%	-3%	-5%	-4%	-4%	2%	-3%	0%	6%	-1%	-2%	1%			
	Analgesics	18%	29%	-67%	13%	16%	59%	4%	-6%	6%	-16%	0%	7%	-22%	-3%	13%	-1%	6%	-14%	-8%	-4%	2%	-2%	2%	8%	2%	-3%	6%			
	Neurologicals	2%	2%	-16%	20%	-15%	16%	19%	8%	-7%	4%	-6%	3%	-6%	5%	-6%	-14%	-4%	-19%	-3%	-3%	-5%	-1%	0%	6%	-2%	-1%	1%			
	Hormones	-12%	-6%	-44%	-18%	-16%	28%	0%	-10%	-25%	-9%	1%	2%	-2%	9%	-7%	-8%	-3%	-15%	-8%	-5%	11%	0%	9%	3%	-1%	-1%	1%			
Diabetes therapy	-17%	-8%	-22%	5%	3%	6%	5%	5%	-4%	-6%	23%	10%	-1%	-5%	-2%	22%	8%	-2%	-7%	-6%	-10%	2%	0%	10%	-3%	-4%	-3%				
1998	Overall	-12%	-13%	-21%	-17%	4%	-4%	18%	23%	7%	-2%	5%	-4%	-2%	0%	1%	-9%	-5%	-9%	-5%	-2%	4%	-10%	2%	10%	1%	-1%	2%			
	Cardiovasculars	-18%	-26%	-17%	-13%	9%	2%	15%	25%	13%	-4%	4%	0%	-4%	0%	1%	-4%	-1%	-6%	-3%	-2%	6%	-11%	-3%	9%	-1%	-2%	2%			
	Psychotherapeutics	-6%	-14%	-25%	-14%	-3%	4%	38%	34%	0%	15%	25%	-1%	8%	0%	-11%	-21%	-14%	-13%	-4%	1%	-2%	-9%	-1%	6%	0%	-2%	2%			
	Cholesterol agents	-30%	-34%	-52%	-35%	9%	18%	-1%	9%	-40%	0%	-1%	-7%	0%	1%	0%	-1%	0%	-2%	-2%	-1%	5%	-8%	-2%	6%	0%	-4%	1%			
	Antispasmodics	-16%	-17%	-11%	-33%	16%	-25%	29%	49%	25%	-11%	7%	-15%	-4%	0%	10%	-22%	-16%	-16%	-1%	-1%	-4%	-5%	0%	4%	3%	-1%	5%			
	Antiinfectives	-4%	10%	12%	-1%	7%	-22%	15%	10%	38%	-11%	-4%	-21%	-16%	1%	12%	-5%	-6%	-18%	-4%	-2%	-2%	-12%	4%	2%	2%	3%	-2%			
	Antiarthritics	-11%	-5%	4%	0%	15%	-21%	30%	25%	7%	-13%	11%	1%	6%	-5%	0%	-10%	-8%	2%	-10%	-7%	-5%	-15%	4%	11%	-6%	-10%	-5%			
	Analgesics	13%	20%	90%	-15%	27%	71%	5%	0%	4%	-10%	0%	17%	-16%	-7%	15%	-3%	13%	-7%	-7%	2%	3%	-12%	-1%	13%	2%	8%	10%			
	Neurologicals	-3%	-24%	-14%	-8%	-10%	15%	17%	14%	4%	18%	6%	19%	3%	2%	-13%	-7%	2%	-2%	-1%	4%	-4%	-5%	-3%	8%	0%	0%	2%			
	Hormones	1%	-6%	-65%	-33%	-46%	-16%	8%	-3%	-19%	3%	10%	8%	1%	9%	-14%	-5%	0%	-10%	-24%	-10%	52%	-16%	43%	60%	-4%	-7%	-3%			
Diabetes therapy	-13%	-26%	-15%	-19%	6%	9%	1%	19%	-10%	1%	16%	-1%	-4%	-5%	0%	-4%	7%	-2%	-13%	-4%	-15%	-11%	-5%	19%	3%	6%	7%				

## Story #2: Cyclicity

*Cyclicity in Per Capita Expenditure, 1998-2004*

### Seasonal Variation: A Policy Story

A second finding from the analysis of drug utilization and expenditure over time and across regions is the significant amount of seasonality in drug use.

Volumes of prescription drugs consumed typically increase in the winter months and decrease in the summer months. Such findings are consistent with the notion that populations tend to become “sicker” in the winter months, when colds, the flu, and other conditions are more prevalent.

There is, however, a policy component to seasonality in drug utilization and expenditure. This is illustrated by comparing the pattern of Volume Effects in Manitoba with those in British Columbia (see figure).

Both Manitoba and British Columbia operate universal, deductible-based public drug plans. Both have had such plans in place prior to the beginning of the period studied in this Rx Atlas (although British Columbia changed the terms of its program in 2003).

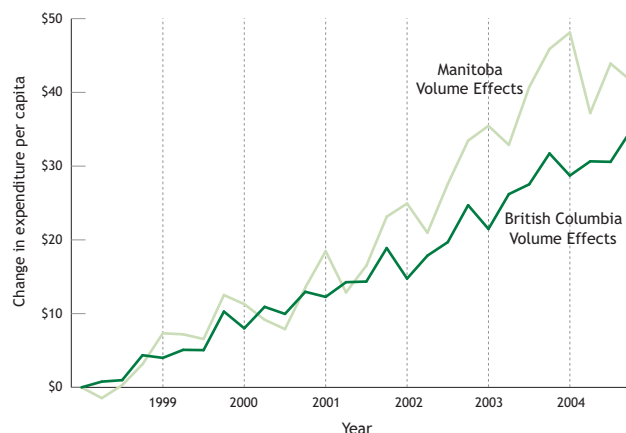
Under a deductible-based drug benefit program, patients must pay for their medicines out-of-pocket or through private insurance at the beginning of the deductible period.

After the individual (or household) has passed the set deductible, however, drug purchases are “free” until the end of the deductible period. This provides patients who have regular drug costs with an incentive to “stockpile” medicines toward the end of the deductible period.

Evidence of this is found in differences in the seasonality of Volume Effects for Manitoba and British Columbia.

Seasonal spikes in British Columbia occur during the fourth quarter of every year. In that province, the deductibles for public drug coverage are based on a calendar year.

### Change in per capita expenditure in two provinces, 1998-2004 (all categories)



Seasonal spikes in Manitoba occur during the first quarter of every year. Deductibles for public drug coverage there are based on a fiscal year. It would be unlikely that the burden of illness in the two provinces differed by an amount equivalent to the time-shift in deductible periods.

Seasonality or stockpiling in drug purchases caused by deductible-based pharmacare programs is a pattern of drug utilization that may deserve further investigation.

# Story #3: Price and Prescription Size

*Effect of Prices and Rx Size on Per Capita Expenditure, 1998-2004*

## Drug Prices and Prescription Size

The cost information in the IMS data includes dispensing fees and retail mark-ups. There was no accurate means to remove the impact of dispensing fees on total expenditure (because there is no single, reliable source of average fees charged in each province, during each quarter, over the period from 1998 to 2004).

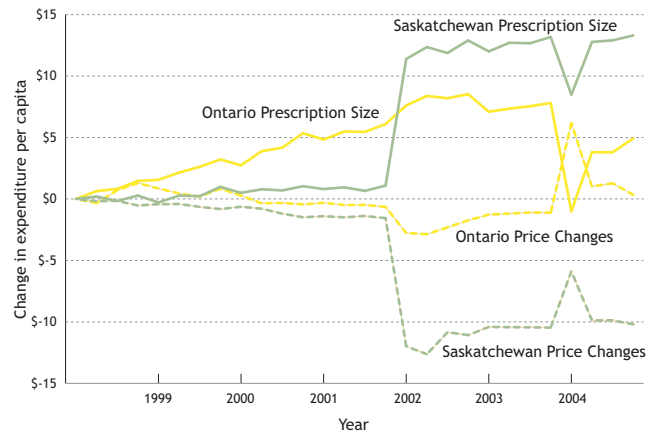
As a result, regional differences in the “Prices” tracked in this Rx Atlas may reflect differences in the average “Prescription Size” as much (or more) than differences in the prices actually charged for the specific drugs in question.

The unit cost of a drug will be lower in periods or regions where prescriptions are longer. This is because, holding constant the price charged for the drug itself, the professional fee paid per unit of the drug is lower if the prescription is for a larger numbers of units. For example, a \$9 dispensing fee raises the cost per tablet by \$0.30 if the prescription is for 30 pills, and by only \$0.09 if the prescription is for 100 pills.

Evidence of the impact of Prescription Size on average Prices paid for drugs (include dispensing fees) can be found in time trends for selected provinces. In Ontario and Saskatchewan, for example, the average Prescription Size changes suddenly at specific periods between the first quarter of 1998 and the last quarter of 2004 (see figure).

In Saskatchewan, Prescription Size increased suddenly in 2002. During the quarter-year where Prescription Size increased, expenditure per capita did not jump suddenly. Rather, Prescription Volume declined slightly and, most notably, Prices declined significantly. These factors offset the cost-impact of the rise in Prescription Size. Moreover, the fall in Prices (which includes dispensing fees) suggests that the change toward fewer but longer prescriptions reduced the average unit price paid for drugs dispensed.

## Variation in price and prescription size in two provinces, 1998-2004 (all categories)



A similar though opposite pattern is observed in Ontario at the beginning of 2004. In this case, Prescription Size fell notably (and temporarily) while Prices increased almost proportionally.

The impact of Prescription Size on Prices may be worth further study to determine whether the savings from writing fewer-but-longer prescriptions come at the cost of reduced quality of care or wastage of unused medicines.

# Overall Expenditure

Level of Per Capita Expenditure, 2004

## Expenditure Levels and Variations

Canadians spent an average of \$420 each on oral solid prescription drugs in 2004. This amounted to over \$13 billion in total spending.

Expenditure per capita varied considerably across provinces. In 2004, per capita expenditure in the provinces varied by \$174 or 56%, from \$312 in Saskatchewan to \$486 in New Brunswick.

Costs in Saskatchewan and British Columbia were approximately 20% below the Canadian average throughout the period from 1998 to 2004. New Brunswick, Quebec, and Nova Scotia were roughly 10% or more above average over the period. Expenditure per capita in Manitoba grew from nearly 30% below the national average to nearly 4% above the national average.

## Determinants of Variation

Most of the variation in expenditure observed in 2004 was due to differences in Volume Effects. This represented differences in the total number of units of medicine purchased per capita across provinces. Some provinces, like Quebec, had far higher Prescription Volume

than the national average while simultaneously having smaller-than-average Prescription Size.

Therapeutic Choices had a moderate impact on variation in expenditure. Interestingly, lower-than-average costs related to Therapeutic Choices are found in some regions with higher-than-average expenditure per capita (Atlantic Canada) and some with lower-than-average expenditure per capita (BC and Saskatchewan).

Price Effects created modest variation in expenditure. Differences across provinces in the rate of generic substitutions (Generic Use) were smaller than differences in prices paid per unit of medicine (Prices). Furthermore, differences in average unit prices were dominated by differences in average Prescription Size. For example, higher prices in Quebec are a reflection of smaller Prescription Sizes, while longer prescriptions in BC resulted in lower prices.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, overall (all therapeutic categories)

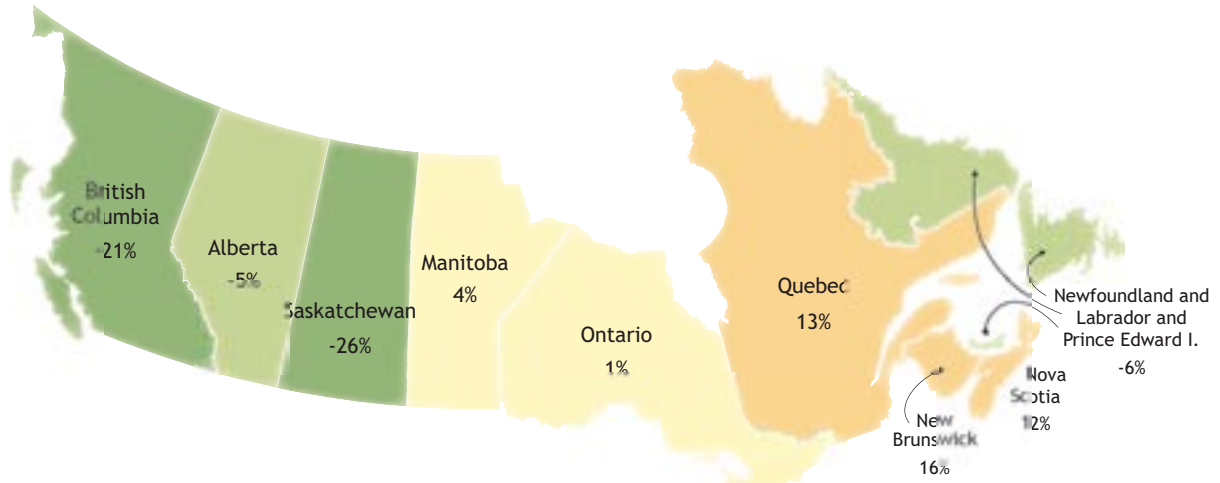
Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$331	\$398	\$312	\$435	\$422	\$475	\$486	\$470	\$395
Per capita spending in Canada	\$420	\$420	\$420	\$420	\$420	\$420	\$420	\$420	\$420
<b>Total Difference</b>	<b>-21.1%</b>	<b>-5.3%</b>	<b>-25.8%</b>	<b>3.5%</b>	<b>0.6%</b>	<b>13.2%</b>	<b>15.8%</b>	<b>11.9%</b>	<b>-5.8%</b>
Difference due to prescription volume	-29.2%	-25.2%	-13.5%	-1.4%	-21.4%	47.9%	-6.0%	-6.6%	-3.7%
Difference due to prescription size	18.1%	22.2%	-10.0%	4.9%	20.9%	-41.1%	26.5%	25.9%	6.4%
<b>Subtotal Volume Effects</b>	<b>-11.1%</b>	<b>-3.0%</b>	<b>-23.5%</b>	<b>3.5%</b>	<b>-0.5%</b>	<b>6.8%</b>	<b>20.5%</b>	<b>19.3%</b>	<b>2.7%</b>
Difference due to therapeutic mix	-2.1%	0.1%	-2.6%	-0.7%	0.4%	2.0%	-4.2%	-4.0%	-6.9%
Difference due to drug mix	-3.2%	1.4%	-1.0%	2.4%	-0.1%	-0.5%	0.1%	-1.0%	-2.5%
<b>Subtotal Therapeutic Choices</b>	<b>-5.3%</b>	<b>1.5%</b>	<b>-3.6%</b>	<b>1.7%</b>	<b>0.3%</b>	<b>1.5%</b>	<b>-4.1%</b>	<b>-4.9%</b>	<b>-9.4%</b>
Difference due to prices	-3.3%	-2.9%	4.0%	0.2%	0.9%	2.8%	0.5%	-1.5%	1.4%
Difference due to generic use	-1.4%	-1.0%	-2.7%	-1.8%	-0.1%	2.1%	-1.1%	-1.0%	-0.6%
<b>Subtotal Price Effects</b>	<b>-4.7%</b>	<b>-3.8%</b>	<b>1.3%</b>	<b>-1.7%</b>	<b>0.8%</b>	<b>4.9%</b>	<b>-0.6%</b>	<b>-2.4%</b>	<b>0.8%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

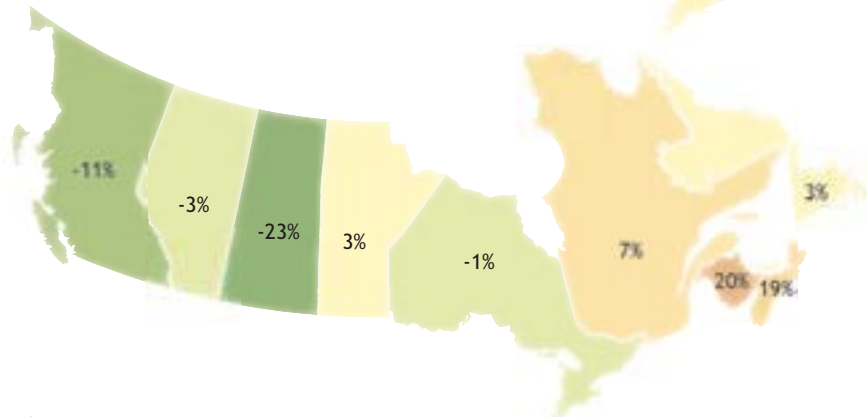
# Overall Expenditure

Determinants of Variation in Per Capita Expenditure, 2004

## Overall Variation, 2004

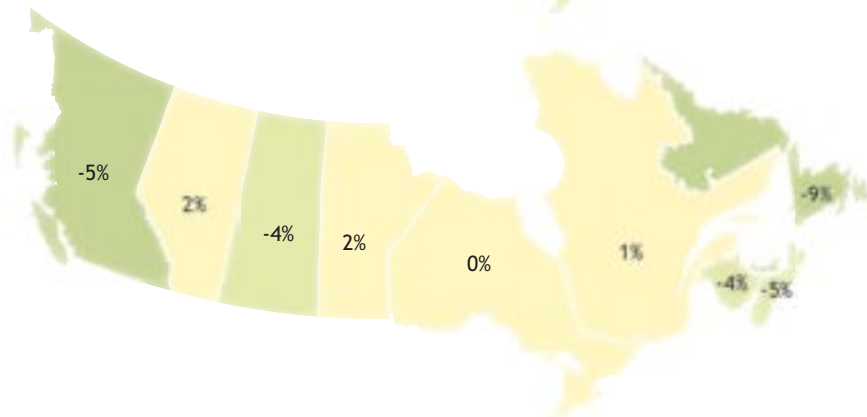


## Volume Effects

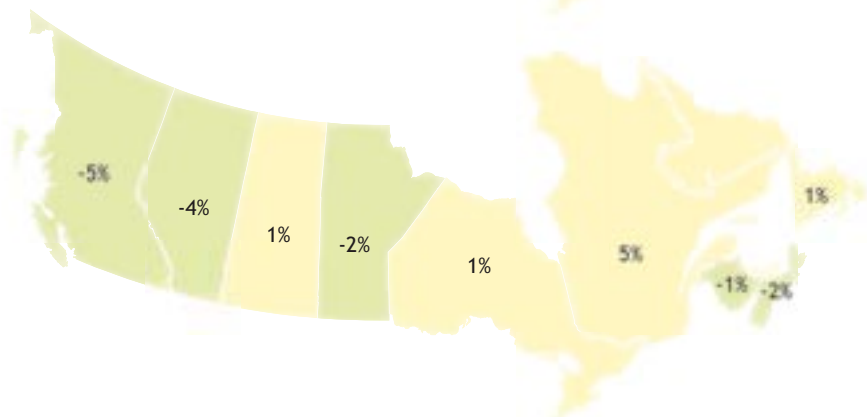


Percent variation from the mean national level of per capita expenditure, 2004

## Therapeutic Choices



## Price Effects



# Overall Expenditure

Change in Per Capita Expenditure, 1998-2004

## Pace of Change, 1998 to 2004

For Canada as a whole, per capita expenditure on oral solid prescription drugs nearly doubled between 1998 and 2004: from \$213 to \$420.

Expenditure grew most rapidly in Manitoba, Quebec, and Alberta, and least rapidly in Nova Scotia and Prince Edward Island and Newfoundland and Labrador. At prevailing rates of growth, expenditure per capita in Manitoba would double in four years, whereas it would take seven years for expenditure per capita in Nova Scotia to double.

## Determinants of Change

While rates of per capita expenditure growth varied across provinces, the broad determinants of change in expenditure was consistently ranked: Volume Effects dominated cost growth in all provinces, followed by Therapeutic Choices, and then Price Effects.

Most of the growth in expenditure in Canada and in all provinces was due to increased Prescription Volume. Growth in the average Prescription Size further increased expenditure in all provinces but Quebec.

Therapeutic Choices were the second most significant category of expenditure determinants. These decisions increased expenditure per capita by 3.3% to 5.1% per year across provinces. Changes in Therapeutic Mix (the mix of drug classes selected) increased national expenditure by more than changes in Drug Mix (choice of drugs within classes).

Price Effects had relatively modest impacts on drug expenditure across Canada. Moderate savings stemming from the use of generic drugs generally more than offset gradually increasing unit prices paid for drugs (including dispensing fees). The notable exceptions were Saskatchewan, where the average unit prices fell by 2.5% per year, and Manitoba, where average unit prices increased at a rate of 2.5% per year.

Note: Manitoba's expenditure growth may have been due, in part, to Internet pharmacy sales to the United States. The IMS data may capture some US-bound purchases, which would be reflected in Prescription Volume, and US demand may have increased dispensing fees in Manitoba, which would be reflected in the average unit price data.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, overall (all therapeutic categories)

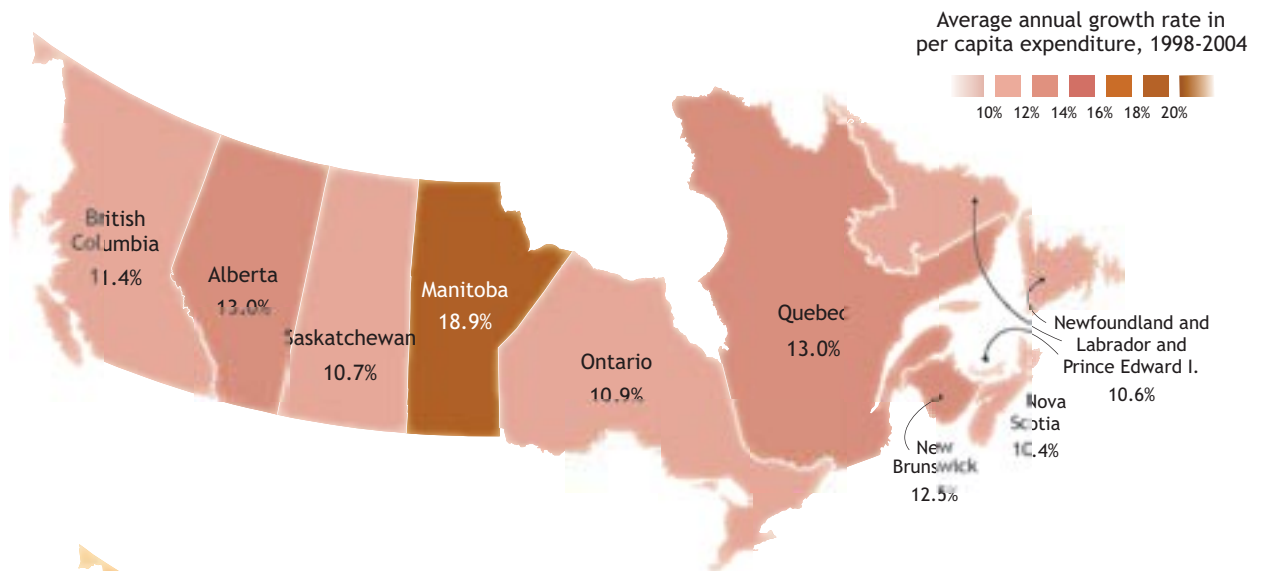
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$213	\$173	\$191	\$169	\$154	\$228	\$228	\$240	\$260	\$216
Per capita spending in 2004	\$420	\$331	\$398	\$312	\$435	\$422	\$475	\$486	\$470	\$395
Average Annual Growth (AAG)	11.9%	11.4%	13.0%	10.7%	18.9%	10.9%	13.0%	12.4%	10.4%	10.6%
AAG due to prescription volume	8.2%	8.4%	7.2%	6.8%	11.2%	6.8%	10.3%	5.0%	4.2%	3.7%
AAG due to prescription size	0.2%	0.2%	3.2%	3.3%	1.2%	0.6%	-0.4%	3.5%	2.9%	3.5%
Subtotal Volume Effects	8.4%	8.6%	10.4%	10.1%	12.4%	7.4%	10.0%	8.5%	7.2%	7.2%
AAG due to therapeutic mix	2.9%	2.7%	2.6%	2.7%	3.3%	3.1%	2.9%	3.2%	2.7%	2.6%
AAG due to drug mix	1.0%	0.6%	0.9%	1.6%	1.8%	0.9%	1.3%	1.4%	0.9%	1.3%
Subtotal Therapeutic Choices	3.9%	3.3%	3.5%	4.3%	5.1%	4.0%	4.2%	4.7%	3.6%	3.8%
AAG due to prices	0.6%	0.6%	0.3%	-2.5%	2.5%	0.5%	-0.6%	0.4%	0.7%	0.6%
AAG due to generic use	-1.0%	-1.2%	-1.1%	-1.2%	-1.1%	-0.9%	-0.6%	-1.1%	-1.1%	-1.1%
Subtotal Price Effects	-0.3%	-0.6%	-0.9%	-3.7%	1.4%	-0.5%	-1.2%	-0.7%	-0.4%	-0.4%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

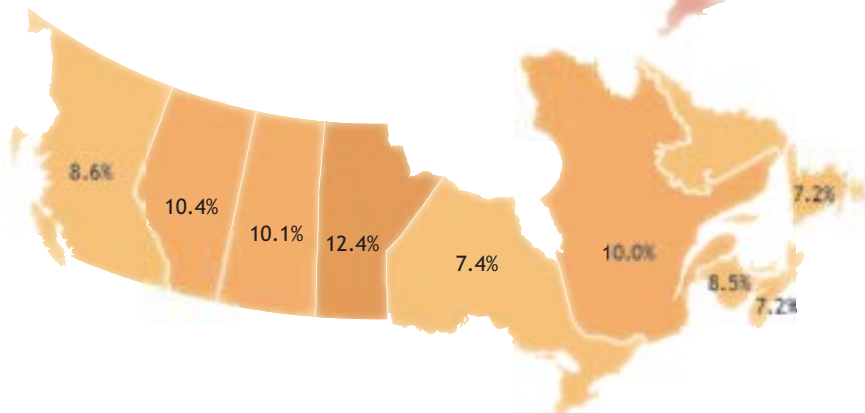
# Overall Expenditure

Determinants of Change in Per Capita Expenditure, 1998-2004

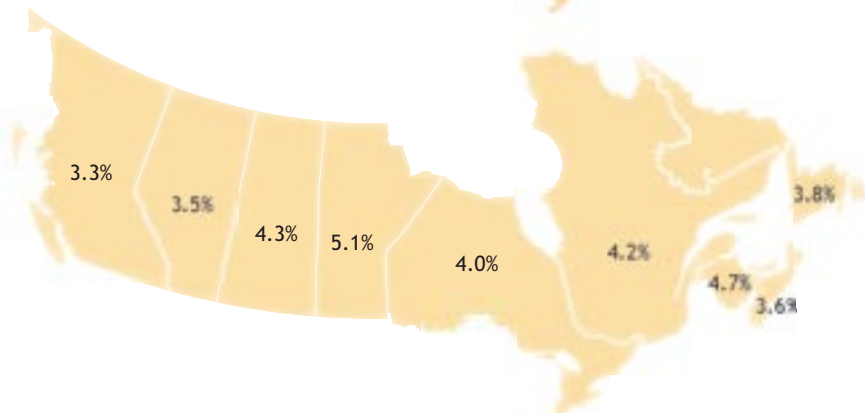
## Overall Growth Rate, 1998-2004



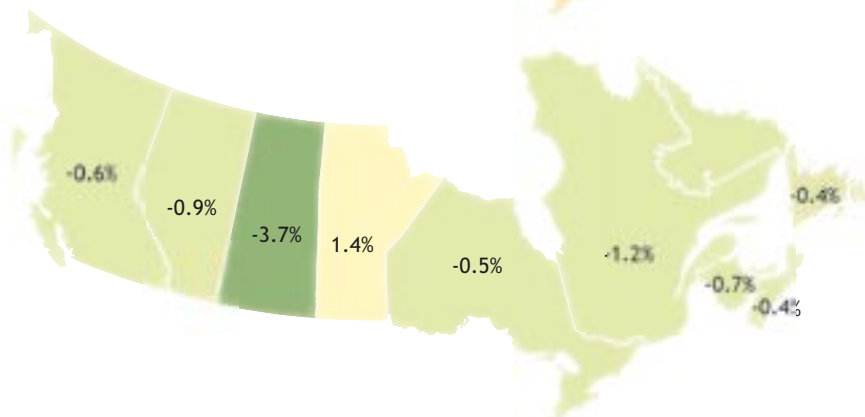
## Volume Effects



## Therapeutic Choices



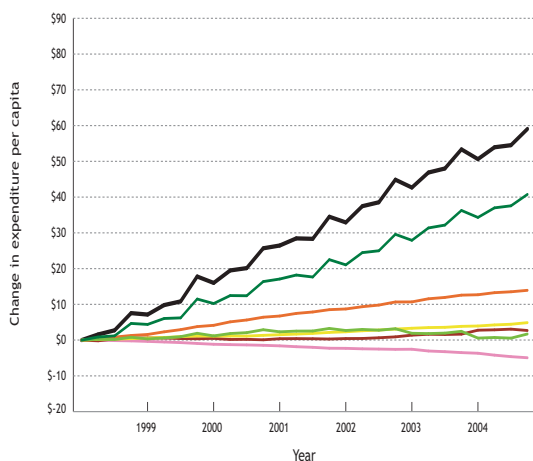
## Price Effects



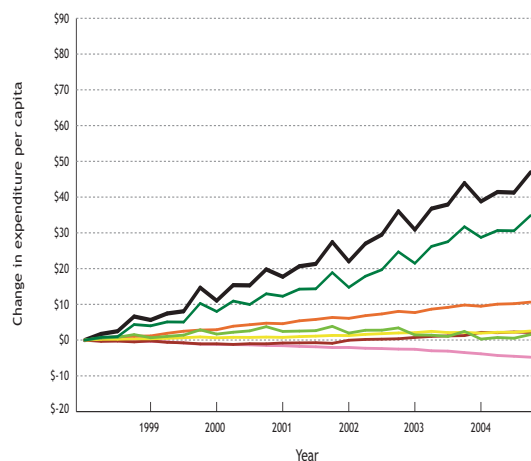
# Overall Expenditure

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

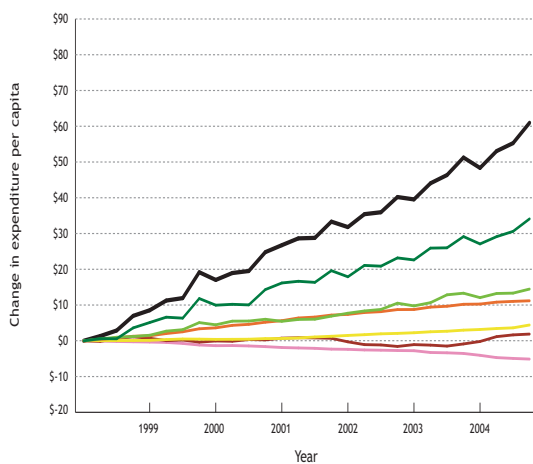
## Canada



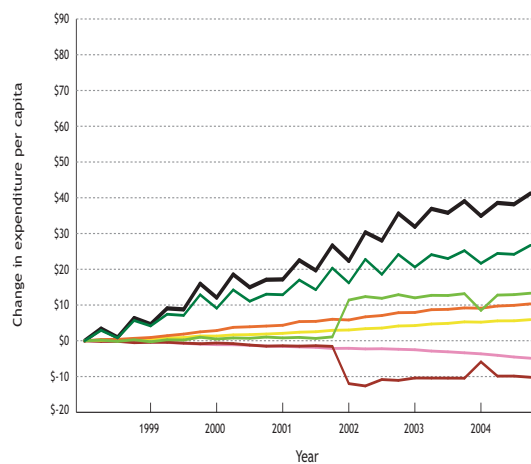
## British Columbia



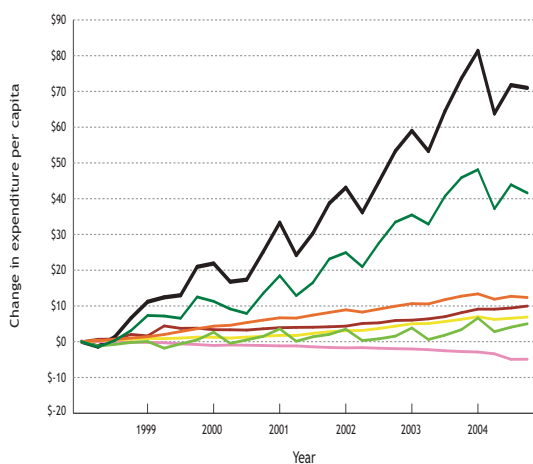
## Alberta



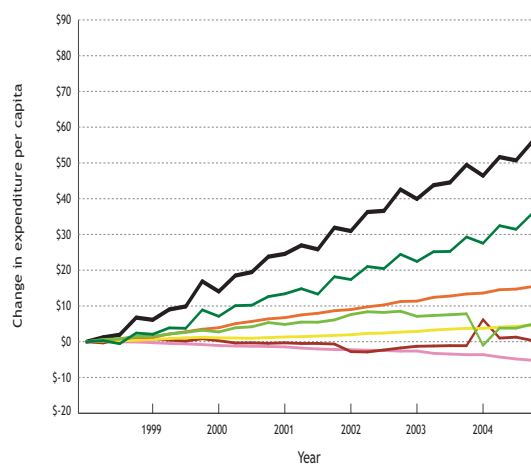
## Saskatchewan



## Manitoba



## Ontario

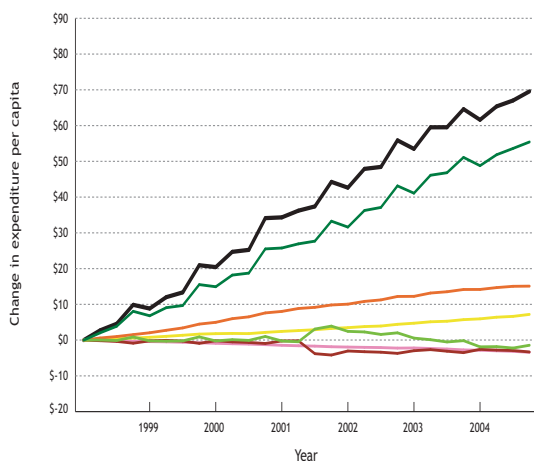


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

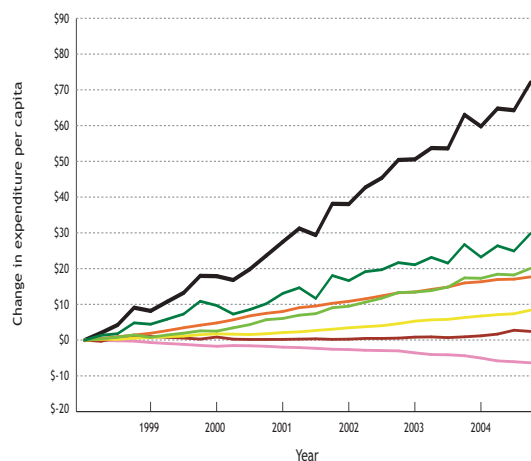
# Overall Expenditure

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

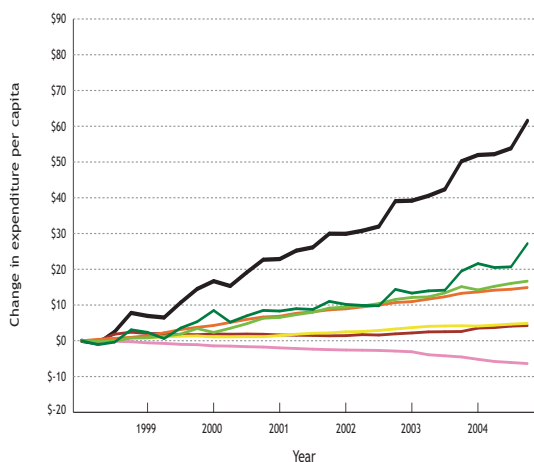
Quebec



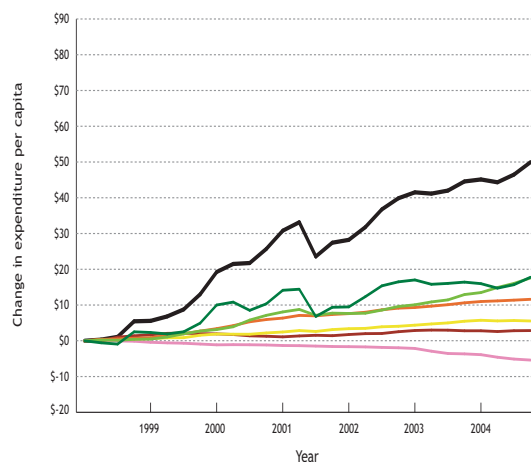
New Brunswick



Nova Scotia

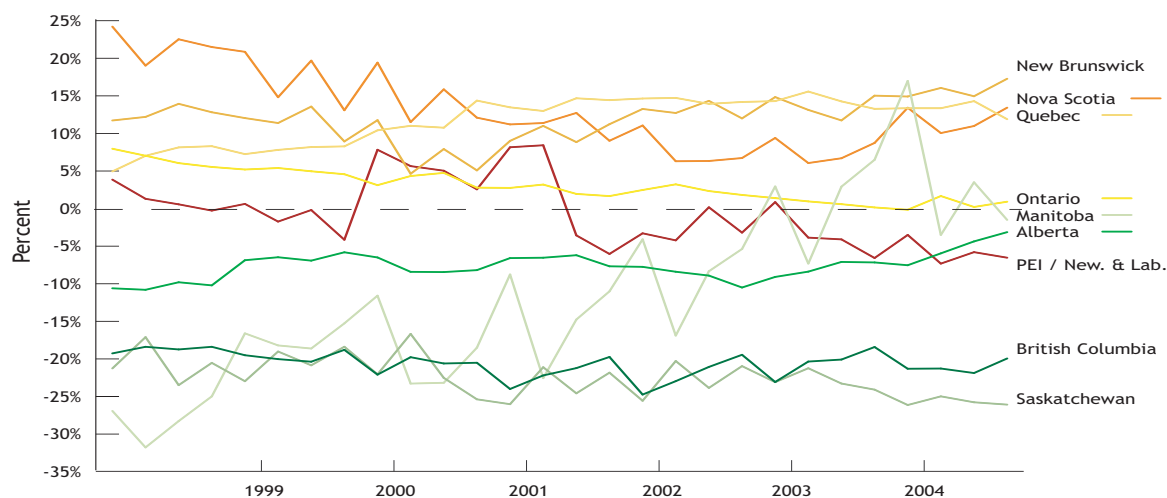


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, overall (all therapeutic categories)



## Expenditure Levels and Variations

Canadians spend more on cardiovascular drugs than any other therapeutic category of medicine. Average spending on cardiovascular drugs was \$86 per person in 2004. Almost all of the spending in this category is for drugs regularly used to treat high blood pressure (96%); most is spent on angiotensin II converting enzyme (ACE) inhibitors at 33%, calcium channel blockers at 28%, and angiotensin II receptor blockers (ARBs) at 17%.

Cardiovascular drug expenditure per capita varied significantly across provinces from 1998 to 2004. In 2004, per capita expenditure in the provinces varied by \$38 or 58%, from \$66 in British Columbia to \$104 in Nova Scotia.

As illustrated on the pages that follow, from 1998 to 2004, per capita expenditure was consistently higher in Nova Scotia, Quebec, and New Brunswick than in British Columbia, Alberta, and Saskatchewan. Spending in Manitoba went from well below to just above national average.

## Determinants of Variation

Provincial variation in per capita expenditure on cardiovascular drugs is attributed primarily to variation in Volume Effects. For example, the slightly lower-than-average Prescription Volume dispensed in Nova Scotia was more than offset by the larger-than-average Prescription Sizes. Combined, these Volume Effects caused expenditure per capita in Nova Scotia to be 23% above the national average. People in western Canada tended to use fewer cardiovascular drugs than the rest of the country.

Therapeutic Choices had a small impact on provincial variation in cardiovascular expenditure. British Columbia and the Atlantic provinces were below the national average with respect to Therapeutic Mix (the selection of drug classes); and British Columbia, Saskatchewan and Prince Edward Island and Newfoundland and Labrador were lower than average with respect to Drug Mix (selection of drugs within classes).

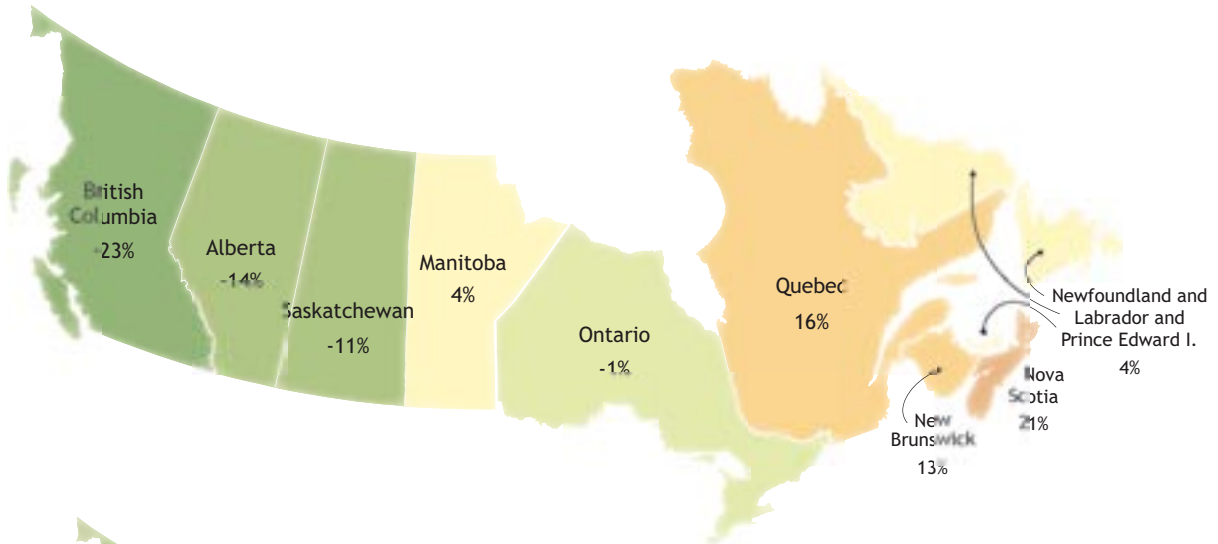
Price Effects were modest in this therapeutic category. Residents of Quebec use generic drugs with less frequency than the Canadian average. Prices for brand and generic drugs were higher in provinces with shorter-than-average prescriptions (Quebec and Saskatchewan), and lower in provinces with longer prescriptions (BC).

### Percent difference between provincial averages and the national average of drug expenditure, 2004, cardiovascular drugs

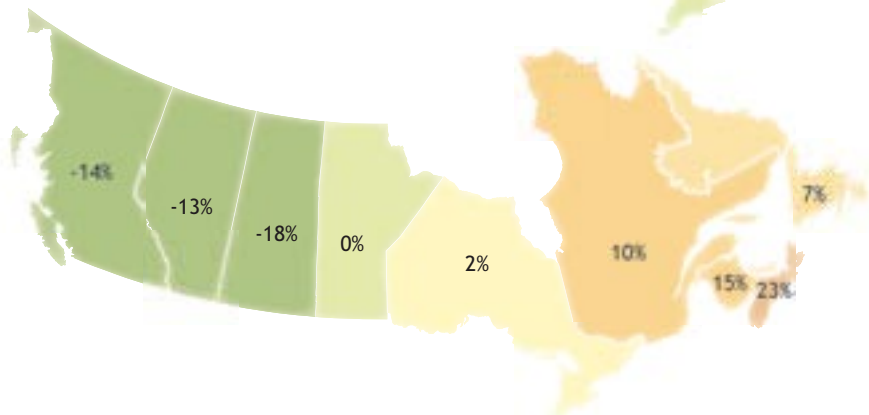
Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$66	\$75	\$77	\$89	\$86	\$101	\$97	\$104	\$89
Per capita spending in Canada	\$86	\$86	\$86	\$86	\$86	\$86	\$86	\$86	\$86
<b>Total Difference</b>	<b>-23.1%</b>	<b>-13.7%</b>	<b>-10.6%</b>	<b>3.5%</b>	<b>-0.7%</b>	<b>16.4%</b>	<b>12.5%</b>	<b>20.7%</b>	<b>3.5%</b>
Difference due to prescription volume	-43.1%	-45.9%	8.5%	-3.6%	-27.4%	62.7%	-16.1%	-3.9%	-2.1%
Difference due to prescription size	28.7%	33.3%	-26.7%	3.3%	29.0%	-52.6%	30.9%	26.8%	9.4%
<b>Subtotal Volume Effects</b>	<b>-14.4%</b>	<b>-12.6%</b>	<b>-18.2%</b>	<b>-0.4%</b>	<b>1.6%</b>	<b>10.1%</b>	<b>14.8%</b>	<b>22.9%</b>	<b>7.4%</b>
Difference due to therapeutic mix	-1.3%	1.9%	2.2%	0.8%	-0.1%	0.2%	-1.6%	-1.6%	-4.1%
Difference due to drug mix	-3.1%	-0.1%	-1.1%	2.2%	0.0%	0.0%	-0.4%	0.3%	-1.9%
<b>Subtotal Therapeutic Choices</b>	<b>-4.4%</b>	<b>1.8%</b>	<b>1.1%</b>	<b>3.0%</b>	<b>-0.2%</b>	<b>0.2%</b>	<b>-2.0%</b>	<b>-1.3%</b>	<b>-6.1%</b>
Difference due to prices	-3.9%	-2.3%	7.6%	1.4%	-1.5%	4.4%	0.8%	-0.3%	3.0%
Difference due to generic use	-0.4%	-0.5%	-1.1%	-0.6%	-0.6%	1.6%	-1.1%	-0.5%	-0.8%
<b>Subtotal Price Effects</b>	<b>-4.3%</b>	<b>-2.9%</b>	<b>6.5%</b>	<b>0.8%</b>	<b>-2.1%</b>	<b>6.1%</b>	<b>-0.3%</b>	<b>-0.9%</b>	<b>2.2%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

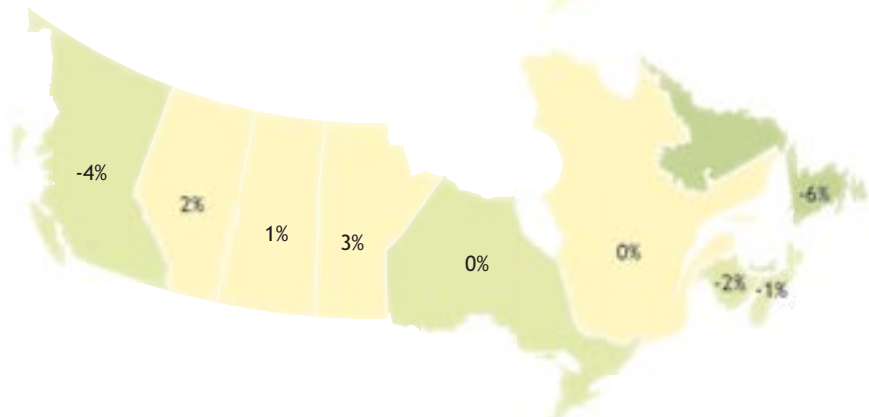
## Overall Variation, 2004



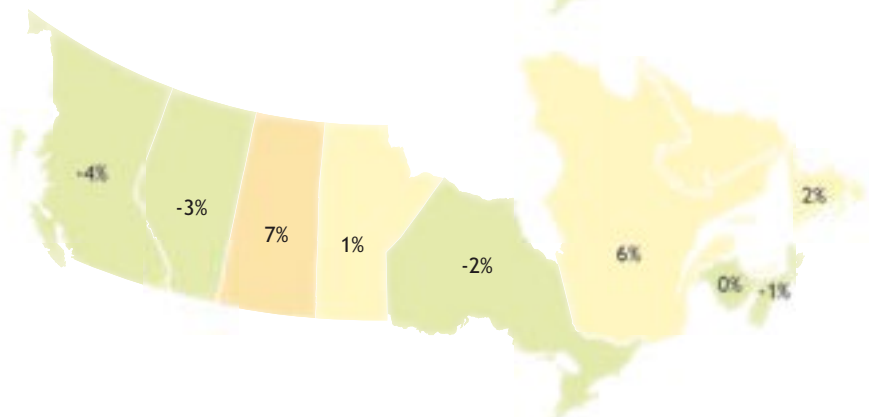
## Volume Effects



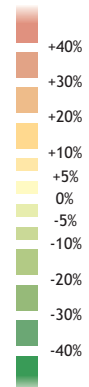
## Therapeutic Choices



## Price Effects



Percent variation from the mean national level of per capita expenditure, 2004



## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on oral solid cardiovascular drugs increased by 83% from \$47 in 1998 to \$86 in 2004. The average annual growth rate was 10.5%, at which per capita expenditure doubles every 6.9 years.

The average annual growth rate for per capita expenditure in Manitoba was unusually high at 17.3%. At that growth rate, per capita expenditure doubles in just over four years. Growth of per capita expenditure on cardiovascular drugs in other provinces ranged from 9.1% per year (Nova Scotia, and Prince Edward Island and Newfoundland and Labrador) to 13.1% per year (Alberta).

## Determinants of Change

For all provinces, cardiovascular drug expenditure growth was largely due to Volume Effects. Far more prescriptions were being written over the period; although, the average size of prescriptions dispensed fell slightly in most provinces.

The increased volume of drug consumed in this category reflects the impact of rapid growth in the use of ACE-inhibitors and ARBs, which explained more than half of the total volume of cardiovascular prescriptions written in 2004.

In contrast to other leading therapeutic categories, Therapeutic Choices contributed relatively little toward cardiovascular drug expenditure trends. Most of the impact of Therapeutic Choices came from Therapeutic Mix (e.g., trends toward using ACE-inhibitors) rather than Drug Mix (e.g., selecting one ACE-inhibitor over another).

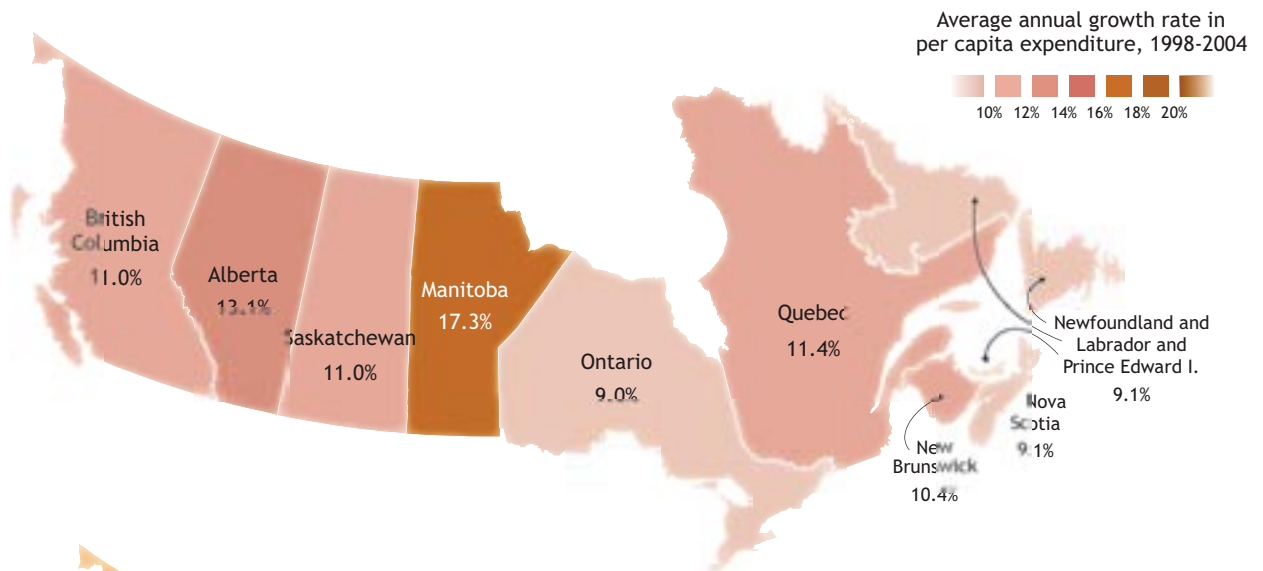
In all provinces except for Manitoba, modest growth in unit prices paid for drugs were roughly offset by savings from increased generic substitutions.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, cardiovascular drugs

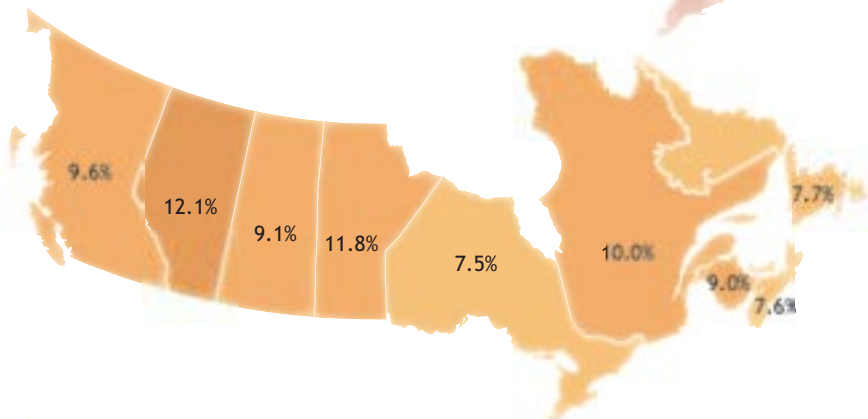
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$47	\$36	\$36	\$41	\$34	\$51	\$53	\$54	\$62	\$53
Per capita spending in 2004	\$86	\$66	\$75	\$77	\$89	\$86	\$101	\$97	\$104	\$89
Average Annual Growth (AAG)	10.5%	11.0%	13.1%	11.0%	17.3%	9.0%	11.4%	10.4%	9.1%	9.1%
AAG due to prescription volume	9.5%	10.4%	9.3%	9.2%	11.9%	7.9%	11.6%	5.2%	5.5%	3.0%
AAG due to prescription size	-0.4%	-0.8%	2.8%	-0.2%	-0.1%	-0.4%	-1.6%	3.8%	2.2%	4.7%
Subtotal Volume Effects	9.0%	9.6%	12.1%	9.1%	11.8%	7.5%	10.0%	9.0%	7.6%	7.7%
AAG due to therapeutic mix	0.9%	1.5%	1.0%	0.9%	1.5%	1.2%	1.1%	1.1%	0.9%	0.8%
AAG due to drug mix	0.4%	0.2%	0.0%	1.0%	1.1%	0.1%	0.5%	0.3%	0.0%	0.5%
Subtotal Therapeutic Choices	1.3%	1.7%	1.0%	1.9%	2.6%	1.3%	1.6%	1.4%	0.9%	1.4%
AAG due to prices	0.7%	0.2%	0.6%	0.7%	3.3%	0.8%	0.4%	0.5%	1.0%	0.4%
AAG due to generic use	-0.6%	-0.5%	-0.6%	-0.7%	-0.4%	-0.6%	-0.6%	-0.4%	-0.4%	-0.4%
Subtotal Price Effects	0.2%	-0.3%	-0.1%	0.0%	2.9%	0.2%	-0.2%	0.1%	0.6%	0.0%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

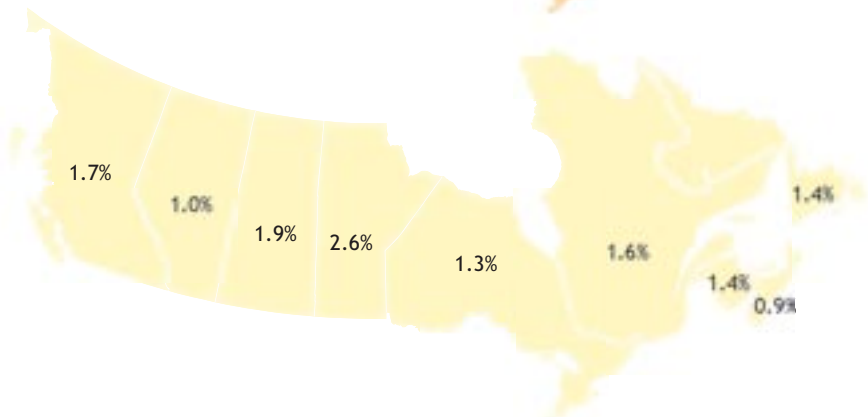
### Overall Growth Rate, 1998-2004



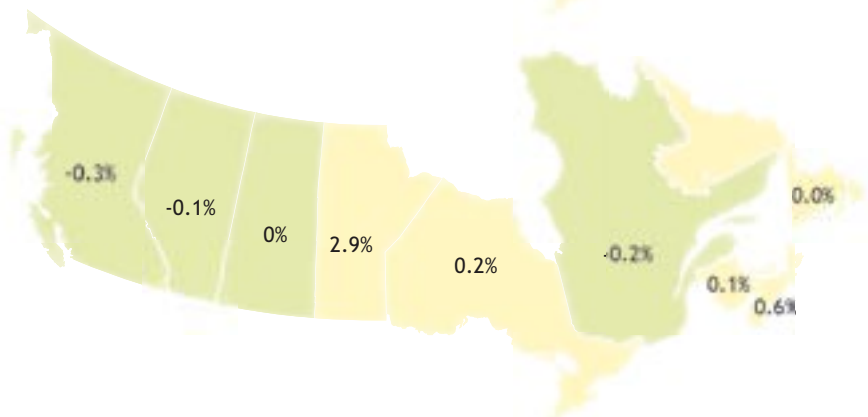
### Volume Effects



### Therapeutic Choices



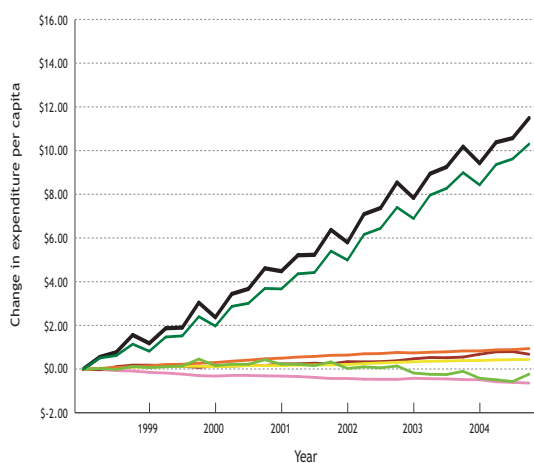
### Price Effects



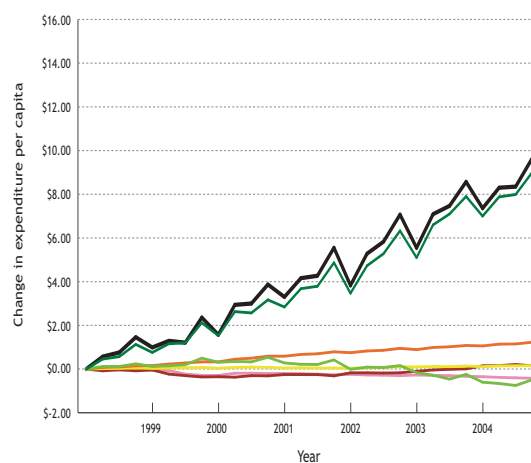
# Cardiovasculars

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

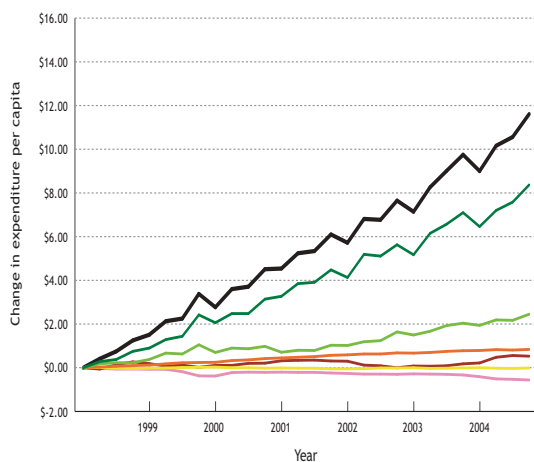
## Canada



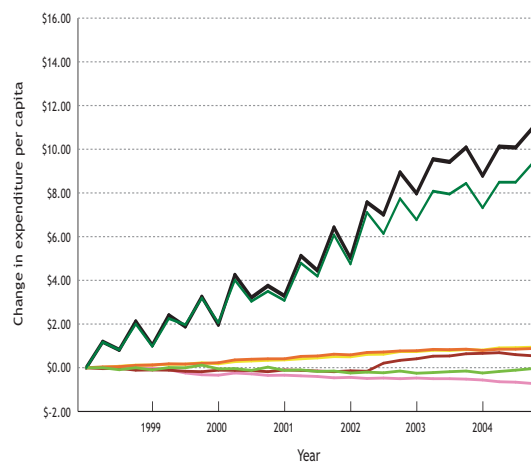
## British Columbia



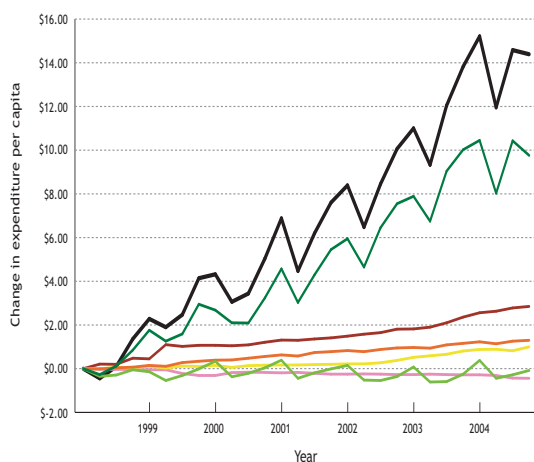
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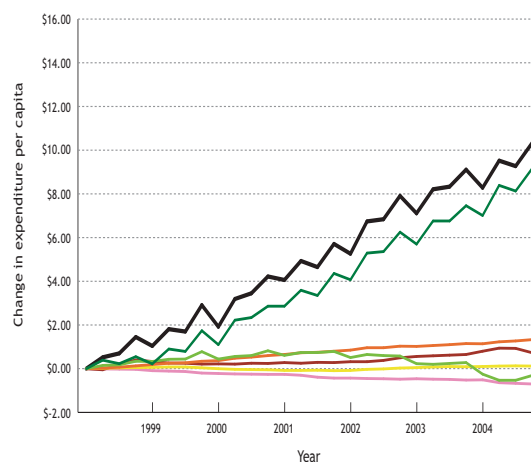
## Saskatchewan



## Manitoba

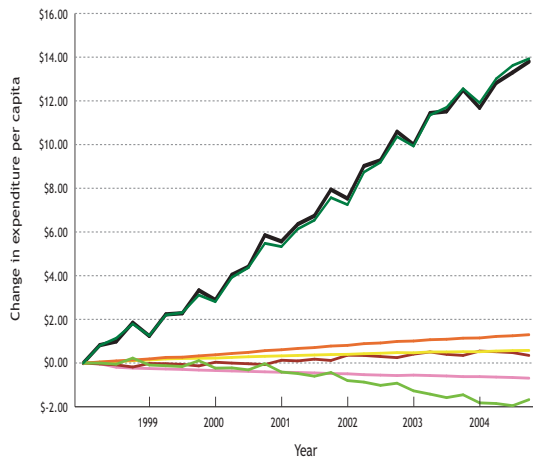


## Ontario

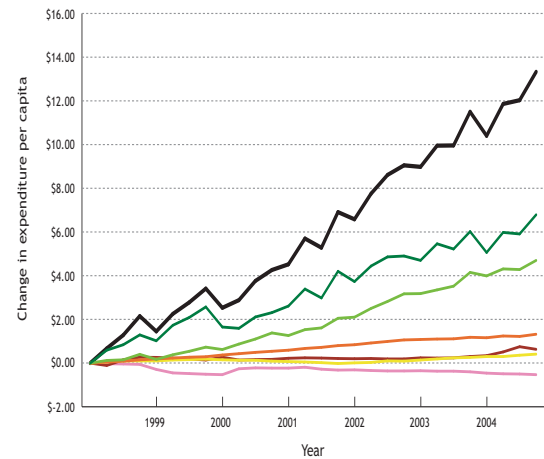


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

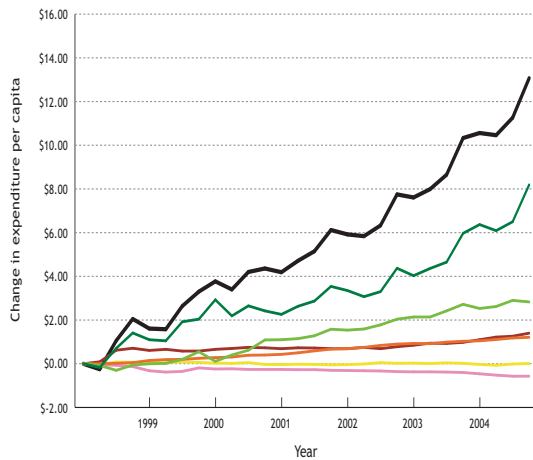
### Quebec



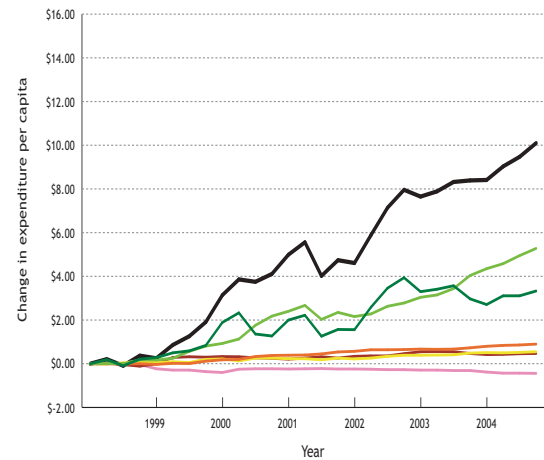
### New Brunswick



### Nova Scotia

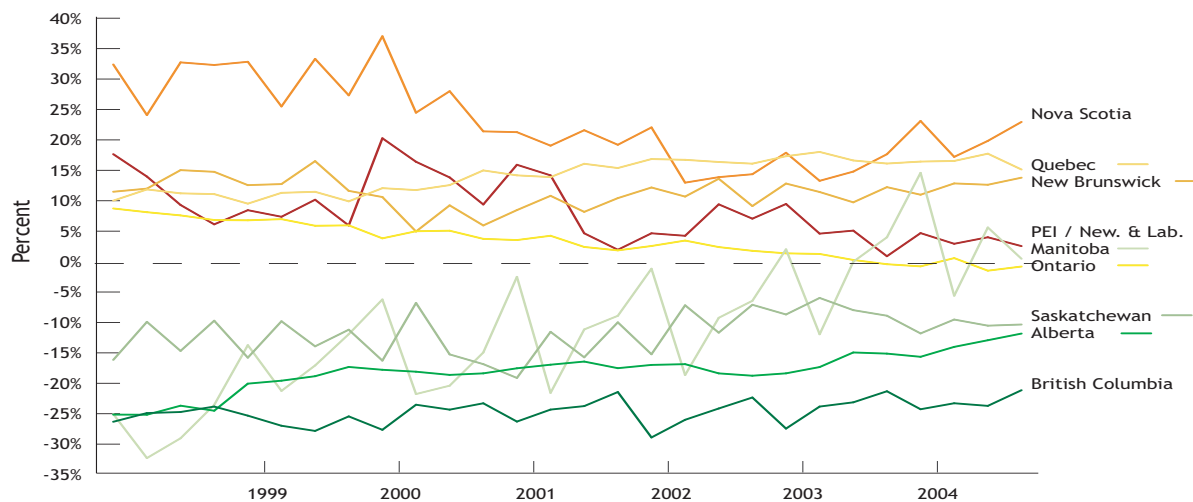


### PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, cardiovascular drugs



## Expenditure Levels and Variations

The second largest therapeutic category of oral solid prescription drug spending is psychotherapeutics. Canadians spent \$60 per capita on these medicines in 2004. Over half of this spending was for selective serotonin reuptake inhibitors (51%) and other antidepressants (9%); the remainder is spent on antipsychotic drugs (28%), benzodiazepines (7%), and other psychotherapeutics.

In 2004, per capita expenditure in the provinces varied by \$32 or 75%, from \$43 in Saskatchewan to \$75 in New Brunswick.

## Determinants of Variation

As with most other therapeutic categories, provincial variation in expenditure on psychotherapeutic drugs stems largely from Volume Effects.

Residents in Saskatchewan had a far lower psychotherapeutic Prescription Volume than the national average, while residents of Quebec had a far higher-than-average Prescription Volume with far lower-than-average Prescription Size. Residents of New Brunswick and Nova Scotia purchased the highest overall volume (Volume Effects) of psychotherapeutic drugs in Canada.

The difference for New Brunswick was enough to drive psychotherapeutic expenditure per capita more than 40% above the national average.

Therapeutic Choices had a moderate impact on psychotherapeutic drug expenditure. Unlike most other leading categories of treatment, residents in the Western provinces (except Saskatchewan) tended to select a more costly Therapeutic Mix and a more costly Drug Mix when it came to purchasing psychotherapeutic drugs.

Price Effects caused a moderate degree of variation in expenditure on oral solid psychotherapeutic drugs. This reflected relatively small differences across provinces in both the unit prices paid for drugs, but a moderate level of generic substitution.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, psychotherapeutic drugs

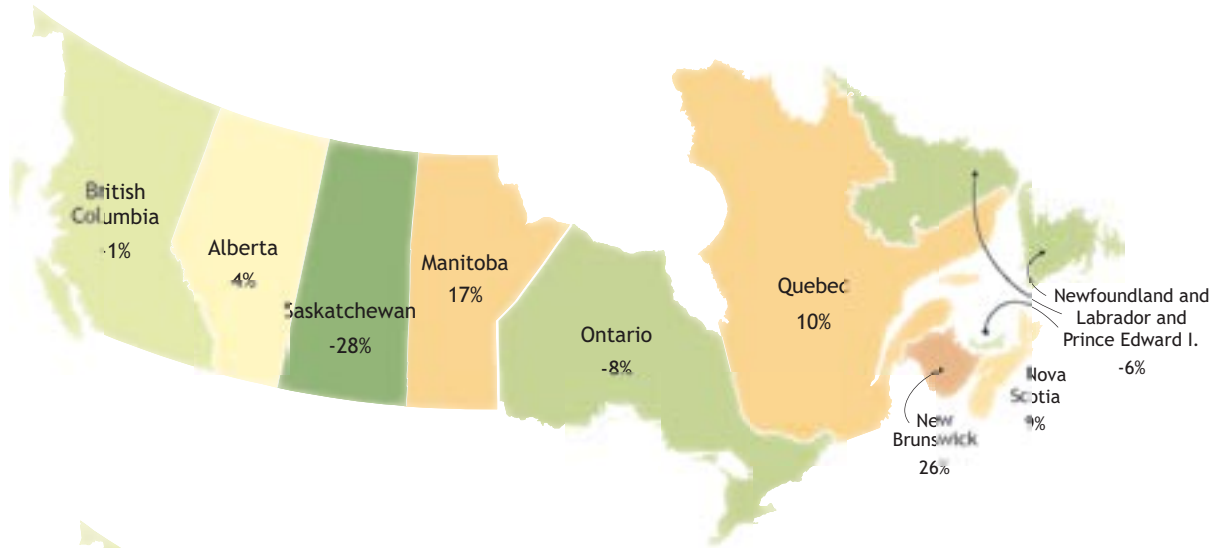
Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$60	\$62	\$43	\$70	\$55	\$66	\$75	\$65	\$57
Per capita spending in Canada	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60
<b>Total Difference</b>	<b>-0.8%</b>	<b>3.9%</b>	<b>-27.7%</b>	<b>17.2%</b>	<b>-8.4%</b>	<b>10.4%</b>	<b>25.7%</b>	<b>8.6%</b>	<b>-5.7%</b>
Difference due to prescription volume	-11.5%	-16.0%	-26.1%	1.3%	-24.0%	44.9%	9.7%	-9.7%	-14.3%
Difference due to prescription size	8.5%	11.0%	5.6%	10.6%	15.7%	-35.1%	31.8%	35.5%	16.9%
<b>Subtotal Volume Effects</b>	<b>-3.0%</b>	<b>-5.1%</b>	<b>-20.5%</b>	<b>12.0%</b>	<b>-8.3%</b>	<b>9.8%</b>	<b>41.6%</b>	<b>25.8%</b>	<b>2.6%</b>
Difference due to therapeutic mix	7.1%	9.1%	-3.7%	4.3%	1.2%	-4.6%	-12.1%	-7.5%	-9.5%
Difference due to drug mix	0.1%	3.3%	-0.5%	4.0%	-1.8%	-0.7%	0.3%	-2.3%	1.5%
<b>Subtotal Therapeutic Choices</b>	<b>7.2%</b>	<b>12.3%</b>	<b>-4.2%</b>	<b>8.3%</b>	<b>-0.6%</b>	<b>-5.3%</b>	<b>-11.8%</b>	<b>-9.8%</b>	<b>-8.0%</b>
Difference due to prices	-1.9%	-1.0%	1.8%	-0.9%	0.4%	2.3%	-0.9%	-4.2%	0.5%
Difference due to generic use	-3.1%	-2.4%	-4.7%	-2.2%	0.1%	3.6%	-3.2%	-3.2%	-0.9%
<b>Subtotal Price Effects</b>	<b>-5.0%</b>	<b>-3.4%</b>	<b>-2.9%</b>	<b>-3.1%</b>	<b>0.5%</b>	<b>5.8%</b>	<b>-4.1%</b>	<b>-7.3%</b>	<b>-0.3%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

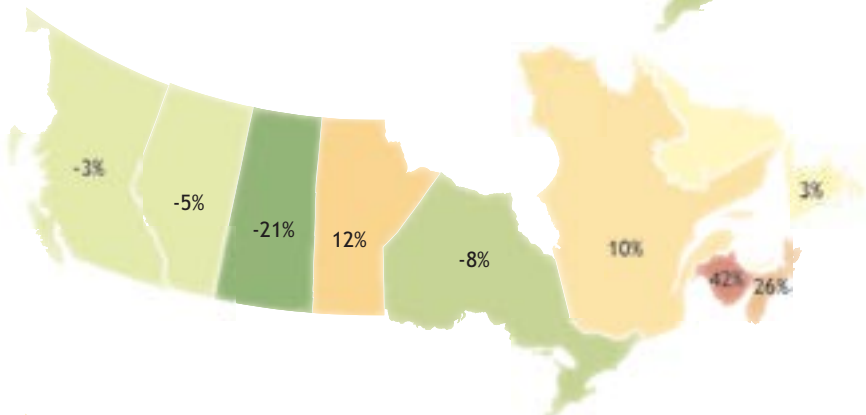
# Psychotherapeutics

Determinants of Variation in Per Capita Expenditure, 2004

## Overall Variation, 2004

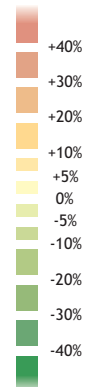
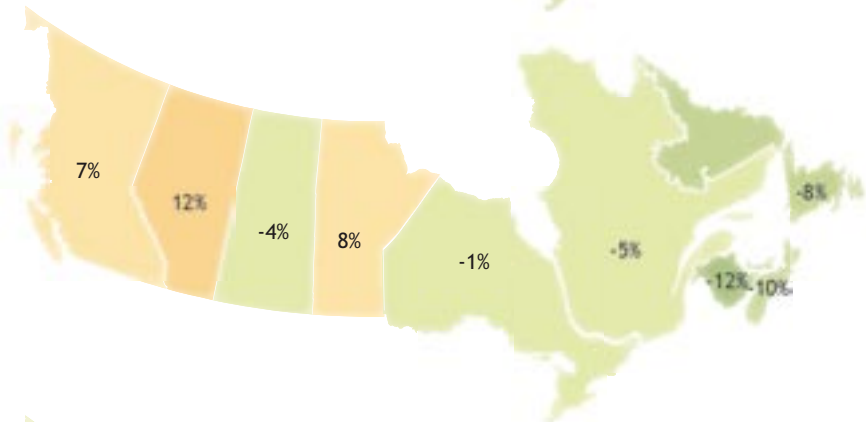


## Volume Effects

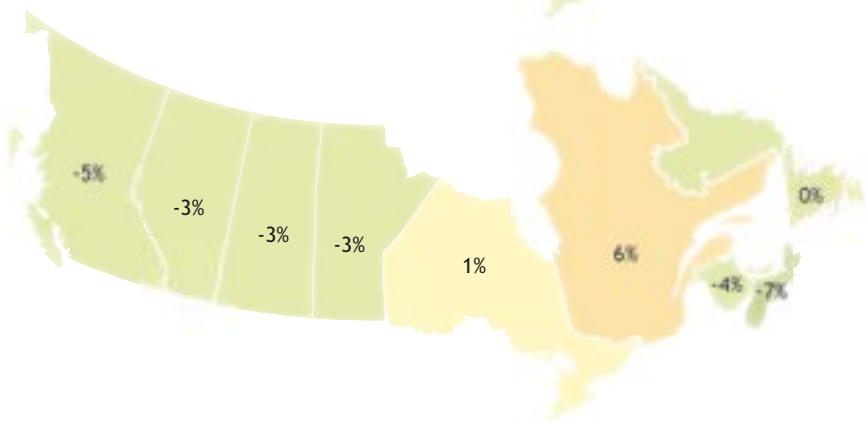


Percent variation from the mean national level of per capita expenditure, 2004

## Therapeutic Choices



## Price Effects



## Pace of Change, 1998 to 2004

Canadian per capita expenditure on psychotherapeutic drugs grew 106% from \$29 in 1998 to \$60 in 2004. The average annual growth rate was 12.8%, at which expenditure doubles in 5.7 years.

The rate of expenditure growth was most rapid in Manitoba and Quebec, and least rapid in Nova Scotia. In 2004, per capita expenditure was highest in New Brunswick and lowest in Saskatchewan. The psychotherapeutic category of drugs contains medicines to manage depression, anxiety and psychoses. In 2004, more than half of total expenditure on psychotherapeutic drugs was concentrated on medicines to treat depression.

## Determinants of Change

Changes in expenditure on psychotherapeutic drugs reflect a combination of expanded use (Volume Effects) and changes in the drug classes prescribed from within this broad therapeutic category (Therapeutic Choices).

Prescription Volume was the largest determinant of expenditure in all provinces except Atlantic Canada. Significant increases in the number of prescriptions

dispensed for selective serotonin reuptake inhibitors (commonly used to treat depression) were observed over the period. The average size of prescriptions fell in all provinces except Alberta and the Atlantic provinces, where average length of prescriptions increased slightly.

Therapeutic Choices had a very significant impact on drug spending in this category of medicines. Therapeutic Mix (selecting classes of drug to prescribe) had a notable impact, increasing national expenditure at an annual rate of 5.7%. Most of this stemmed from the increased use of relatively costly atypical antipsychotics. Drug Mix (e.g., choices among antidepressants) were a more modest contributor to drug expenditure.

Price Effects had a small, cost-saving impact on expenditure in most regions. In all provinces except for Manitoba and Quebec, increased use of generic drugs (particularly from the third quarter of 2003 onwards) created savings that more than offset increases in the unit price of drugs purchased.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, psychotherapeutic drugs

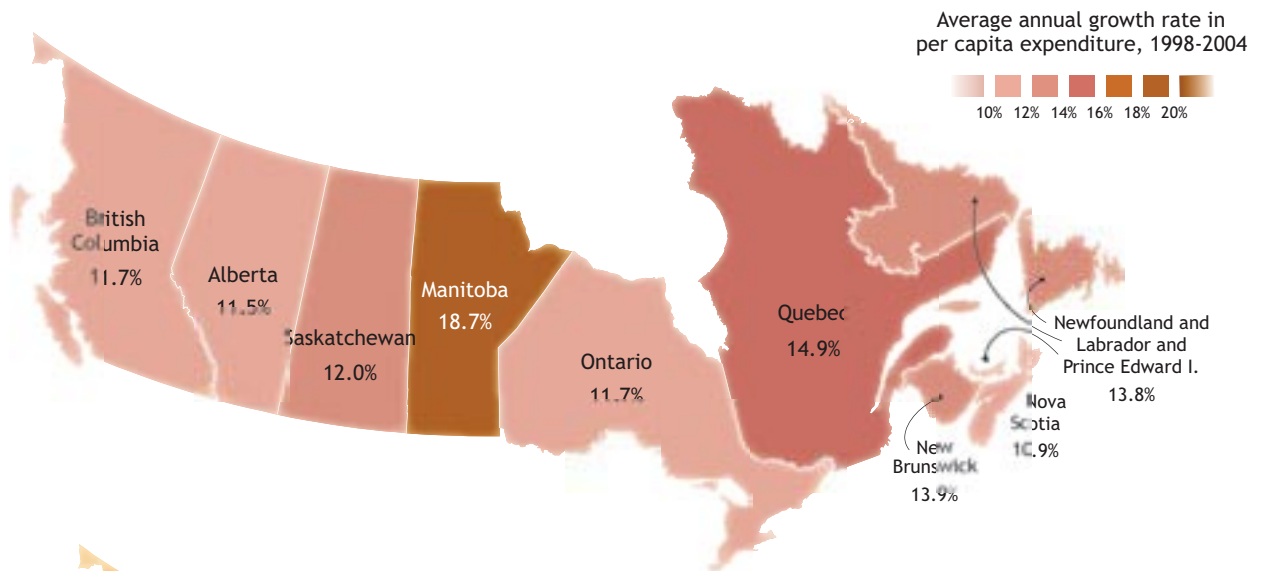
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$29	\$31	\$32	\$22	\$25	\$28	\$29	\$35	\$35	\$26
Per capita spending in 2004	\$60	\$60	\$62	\$43	\$70	\$55	\$66	\$75	\$65	\$57
<b>Average Annual Growth (AAG)</b>	<b>12.8%</b>	<b>11.7%</b>	<b>11.5%</b>	<b>12.0%</b>	<b>18.7%</b>	<b>11.7%</b>	<b>14.9%</b>	<b>13.9%</b>	<b>10.9%</b>	<b>13.8%</b>
AAG due to prescription volume	7.8%	8.3%	6.8%	6.5%	10.3%	6.5%	9.8%	4.5%	3.1%	3.6%
AAG due to prescription size	-0.8%	-0.5%	1.8%	-1.0%	-0.2%	-0.6%	-2.4%	1.9%	2.3%	3.0%
<b>Subtotal Volume Effects</b>	<b>7.0%</b>	<b>7.8%</b>	<b>8.7%</b>	<b>5.5%</b>	<b>10.1%</b>	<b>5.9%</b>	<b>7.4%</b>	<b>6.4%</b>	<b>5.4%</b>	<b>6.6%</b>
AAG due to therapeutic mix	5.7%	4.2%	3.9%	5.1%	5.6%	5.9%	6.6%	6.6%	5.5%	5.8%
AAG due to drug mix	0.7%	1.1%	0.4%	2.5%	2.4%	0.5%	0.9%	2.0%	1.1%	2.3%
<b>Subtotal Therapeutic Choices</b>	<b>6.4%</b>	<b>5.3%</b>	<b>4.2%</b>	<b>7.6%</b>	<b>8.0%</b>	<b>6.5%</b>	<b>7.4%</b>	<b>8.7%</b>	<b>6.6%</b>	<b>8.1%</b>
AAG due to prices	1.0%	0.7%	0.7%	1.0%	2.3%	1.1%	0.7%	0.8%	0.9%	0.5%
AAG due to generic use	-1.6%	-2.1%	-2.1%	-2.1%	-1.7%	-1.7%	-0.6%	-2.0%	-2.0%	-1.4%
<b>Subtotal Price Effects</b>	<b>-0.6%</b>	<b>-1.4%</b>	<b>-1.4%</b>	<b>-1.1%</b>	<b>0.6%</b>	<b>-0.7%</b>	<b>0.1%</b>	<b>-1.2%</b>	<b>-1.1%</b>	<b>-0.9%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

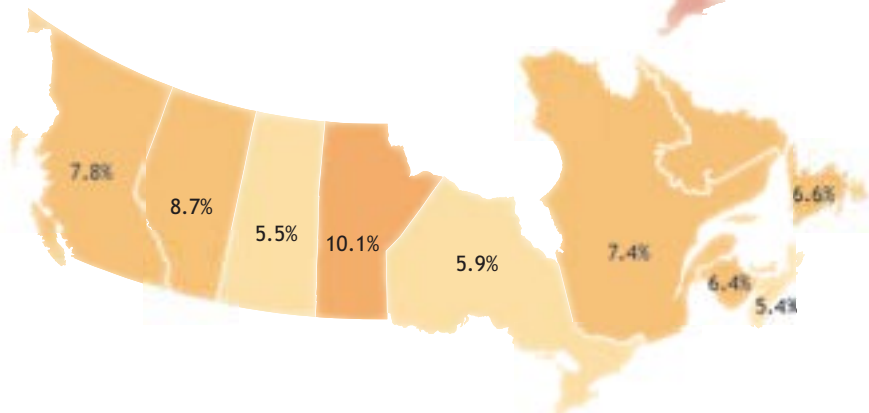
# Psychotherapeutics

Determinants of Change in Per Capita Expenditure, 1998-2004

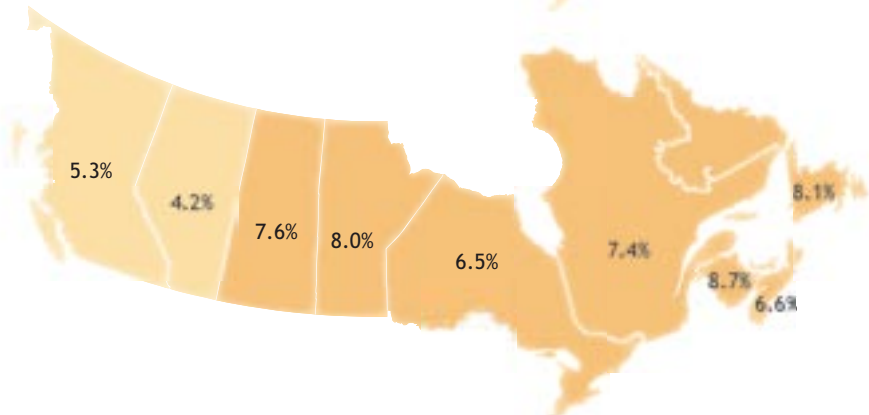
## Overall Growth Rate, 1998-2004



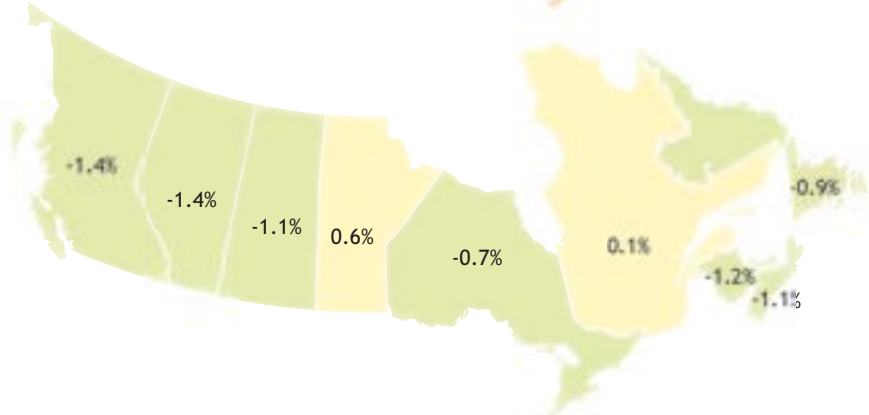
## Volume Effects



## Therapeutic Choices



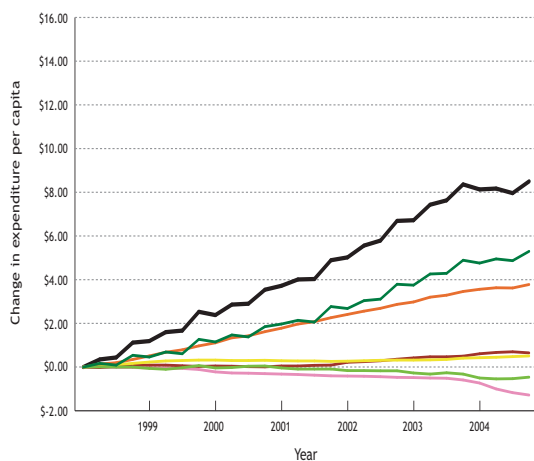
## Price Effects



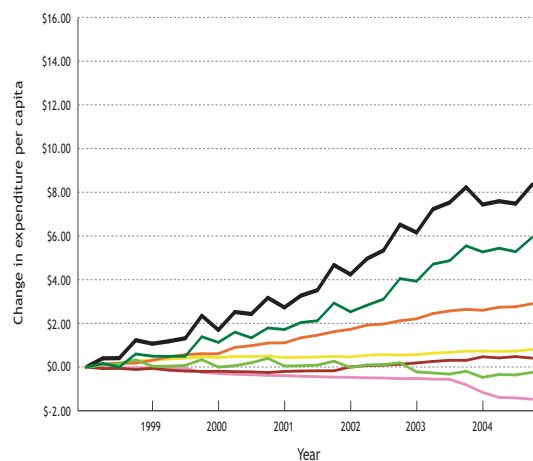
# Psychotherapeutics

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

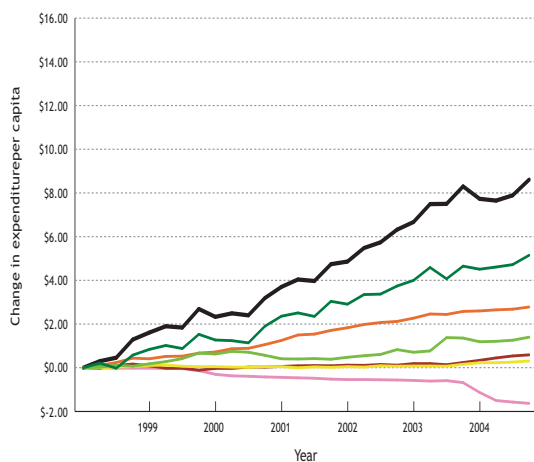
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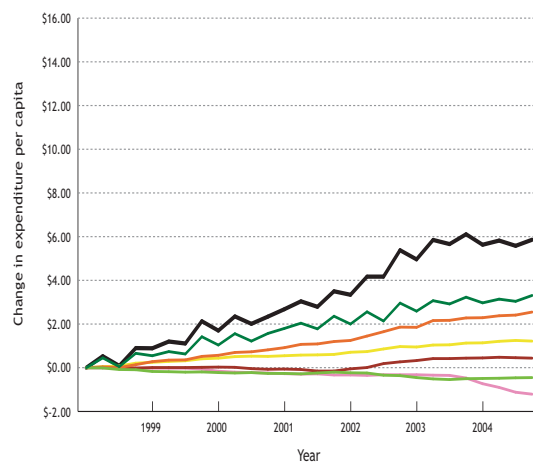
## British Columbia



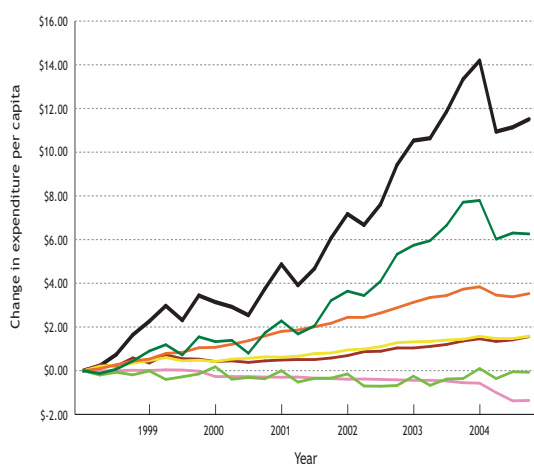
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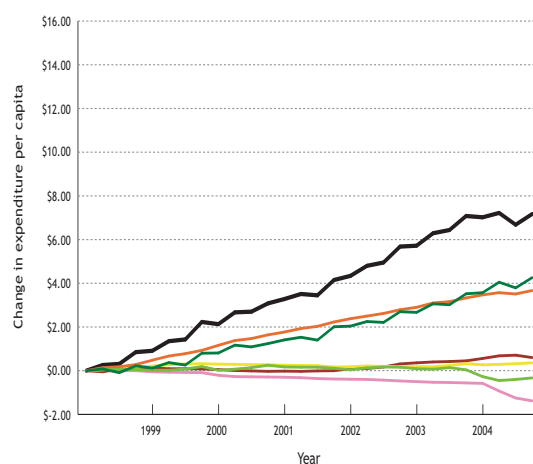
## Saskatchewan



## Manitoba



## Ontario

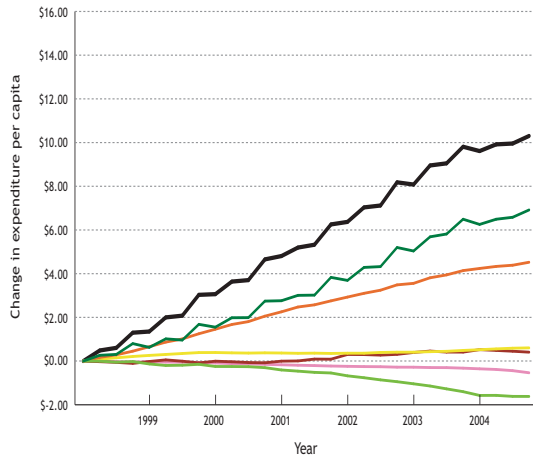


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

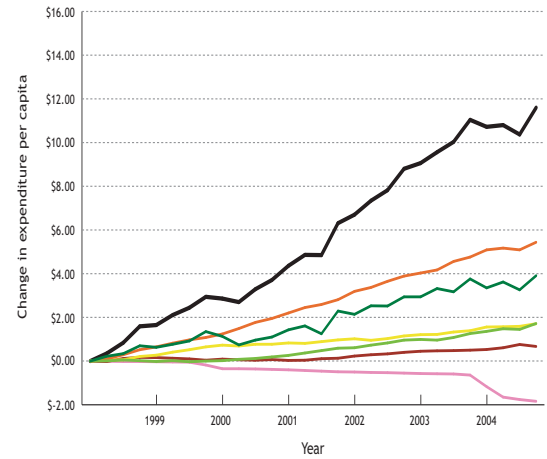
# Psychotherapeutics

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

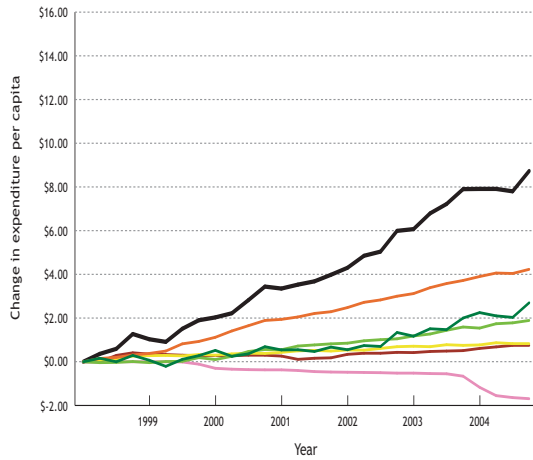
Quebec



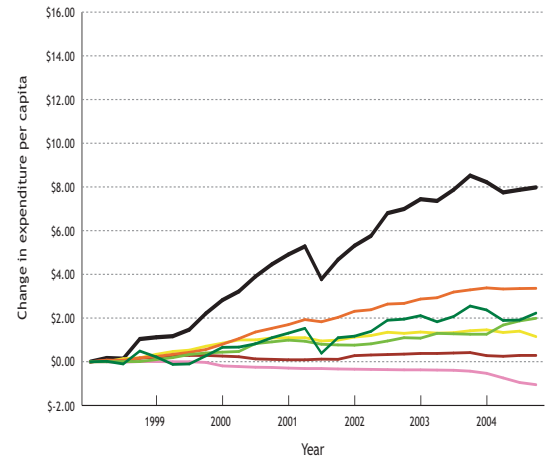
New Brunswick



Nova Scotia

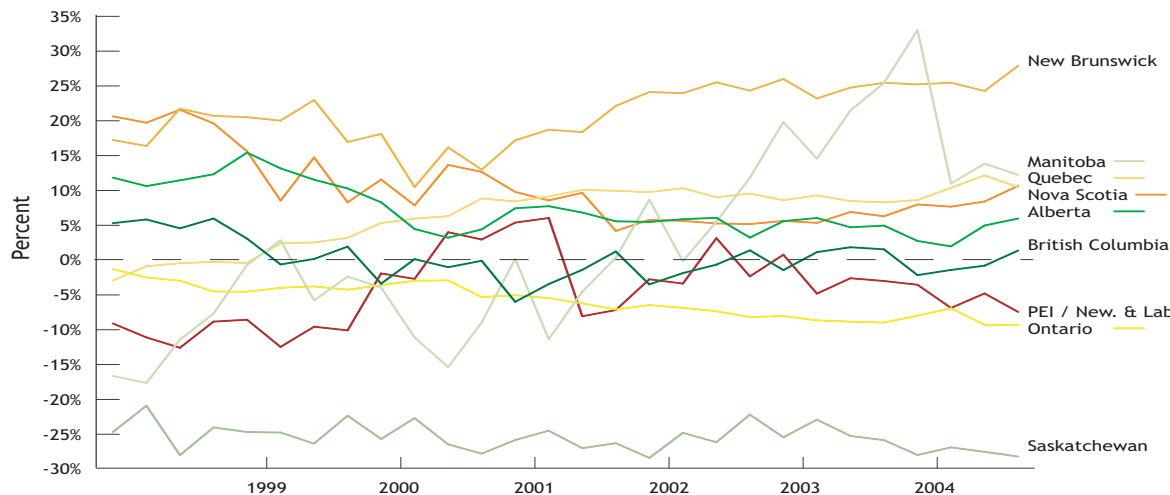


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, psychotherapeutic drugs



## Expenditure Levels and Variations

In 2004, Canadians spent an average of \$54 each on drugs to manage cholesterol levels. Virtually all of this spending was for statins (98%); most was for a single drug type, atorvastatin (57%).

Provincial variation in expenditure per capita was greater for cholesterol drugs than for any other leading therapeutic category. In 2004, per capita expenditure in the provinces varied by \$40 or 140%, from \$29 in Saskatchewan to \$69 in Quebec.

The magnitude of inter-provincial variation remained relatively stable over the period. Expenditure per capita was consistently highest in Quebec and lowest in Saskatchewan.

## Determinants of Variation

Differences in Volume Effects were the dominant source of provincial variation in expenditure on cholesterol drugs. Prescription Volume varied more for this therapeutic category than for any other. In British Columbia, only half the national average of prescriptions was filled. In Quebec, twice the national average was filled. Differences in Prescription Size offset some

of the differences in Prescription Volume; however, residents of Saskatchewan filled fewer-than-average prescriptions of shorter-than-average length.

Because one drug class (statins) dominates this therapeutic category, there were only minor differences in Therapeutic Choices for cholesterol drugs across Canada. In particular, there was virtually no impact from Therapeutic Mix (selection of drug classes).

Price Effects did not have a major impact on provincial variations in expenditure on cholesterol drugs. Saskatchewan and Quebec paid higher-than-average Prices, likely reflecting shorter-than-average Prescription Size (and therefore greater-than-average dispensing fees per unit of drug). Surprisingly, Prices and Prescription Size were higher than average in New Brunswick.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, cholesterol agents

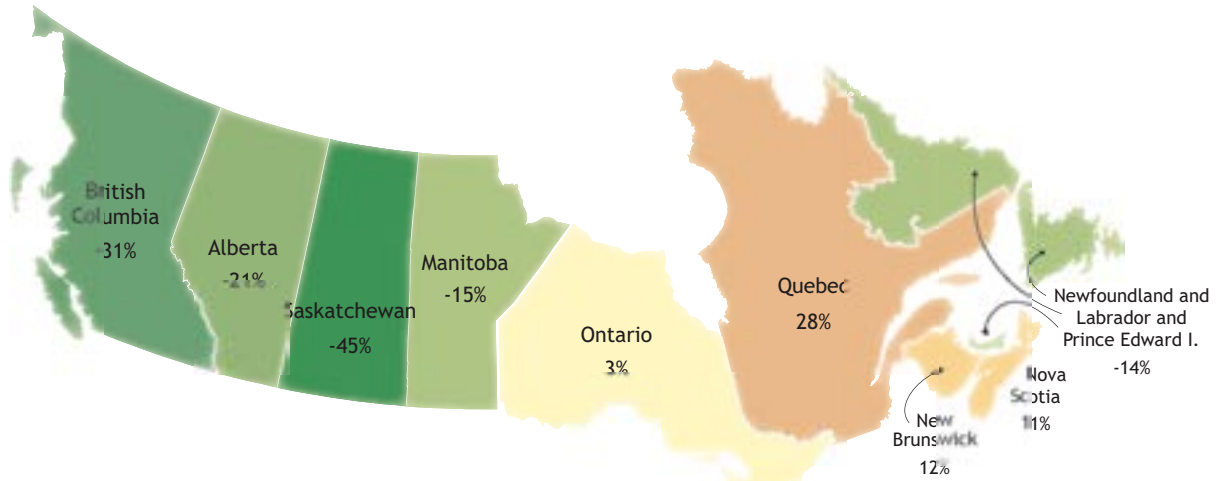
Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$37	\$42	\$29	\$46	\$56	\$69	\$60	\$60	\$46
Per capita spending in Canada	\$54	\$54	\$54	\$54	\$54	\$54	\$54	\$54	\$54
<b>Total Difference</b>	<b>-30.6%</b>	<b>-21.1%</b>	<b>-45.4%</b>	<b>-15.0%</b>	<b>3.2%</b>	<b>27.6%</b>	<b>11.7%</b>	<b>11.2%</b>	<b>-14.3%</b>
Difference due to prescription volume	-55.1%	-49.0%	-20.9%	-15.6%	-29.4%	76.3%	-21.3%	-14.1%	-14.8%
Difference due to prescription size	27.7%	31.2%	-25.3%	0.3%	32.5%	-52.3%	29.5%	25.9%	-2.0%
<b>Subtotal Volume Effects</b>	<b>-27.4%</b>	<b>-17.9%</b>	<b>-46.2%</b>	<b>-15.2%</b>	<b>3.1%</b>	<b>24.0%</b>	<b>8.2%</b>	<b>11.8%</b>	<b>-16.8%</b>
Difference due to therapeutic mix	0.0%	0.1%	0.1%	0.1%	0.2%	-0.2%	0.0%	0.1%	0.0%
Difference due to drug mix	0.7%	0.0%	-1.7%	0.7%	1.4%	-1.4%	2.3%	-0.1%	-0.3%
<b>Subtotal Therapeutic Choices</b>	<b>0.7%</b>	<b>0.1%</b>	<b>-1.5%</b>	<b>0.8%</b>	<b>1.5%</b>	<b>-1.6%</b>	<b>2.2%</b>	<b>-0.1%</b>	<b>-0.3%</b>
Difference due to prices	-2.4%	-2.2%	5.0%	0.8%	-0.4%	1.7%	3.0%	0.9%	4.5%
Difference due to generic use	-1.5%	-1.2%	-2.6%	-1.4%	-1.1%	3.5%	-1.7%	-1.5%	-1.7%
<b>Subtotal Price Effects</b>	<b>-3.9%</b>	<b>-3.4%</b>	<b>2.3%</b>	<b>-0.6%</b>	<b>-1.5%</b>	<b>5.2%</b>	<b>1.3%</b>	<b>-0.5%</b>	<b>2.8%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

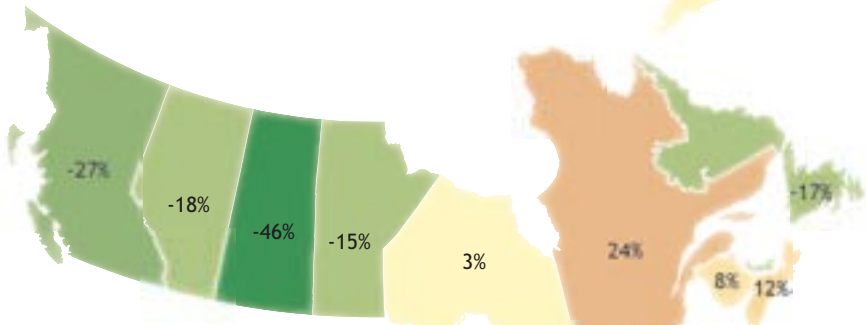
# Cholesterol Agents

Determinants of Variation in Per Capita Expenditure, 2004

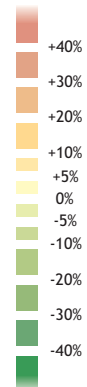
Overall Variation, 2004



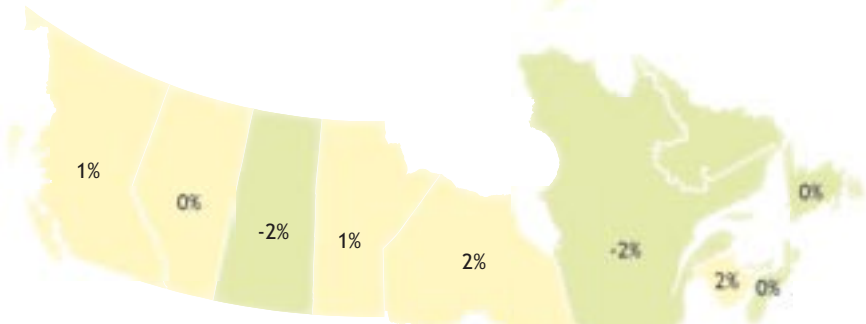
Volume Effects



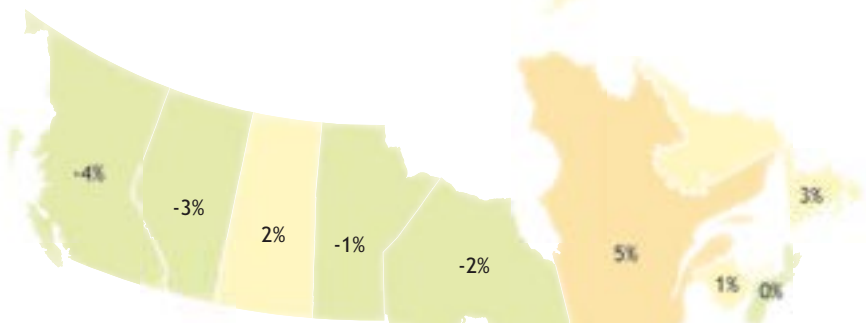
Percent variation from the mean national level of per capita expenditure, 2004



Therapeutic Choices



Price Effects



## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on cholesterol agents increased by 145% from \$22 in 1998 to \$54 in 2004. The average annual growth rate was roughly 16%, making this the second fastest growing category of drug treatment in Canada. At prevailing rates, per capita expenditure would double every 4.7 years.

Cholesterol drug expenditure increased most rapidly in Manitoba (22.9% per year) and Prince Edward Island and Newfoundland and Labrador (22.4% per year). Expenditure per capita in this therapeutic category grew least rapidly (14.3%) in Ontario.

## Determinants of Change

While rates of growth in cholesterol drug expenditure varied across provinces, determinants of change in per capita spending were relatively consistent. Expenditure growth in this therapeutic category is attributed almost entirely to Prescription Volume. This trend was itself driven by rapid growth in the use of statins such as atorvastatin—the world's top-selling drug.

Therapeutic Choices had a more modest impact on cholesterol drug expenditure growth. Because a single drug class dominated the therapeutic category, changes in Therapeutic Mix had little impact on expenditure inflation. Changes in Drug Mix (e.g., the choice of statins) had a more notable expenditure-increasing impact, contributing 2% to 5% per year to expenditure inflation. Spending growth due to Drug Mix was highest in the Atlantic Provinces, Alberta, and Saskatchewan.

Price Effects generated moderate savings for both Canada as a whole and for each province. This was largely due to savings stemming from the use of newly available generic drugs, particularly from 2003 onwards (see following pages).

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, cholesterol agents

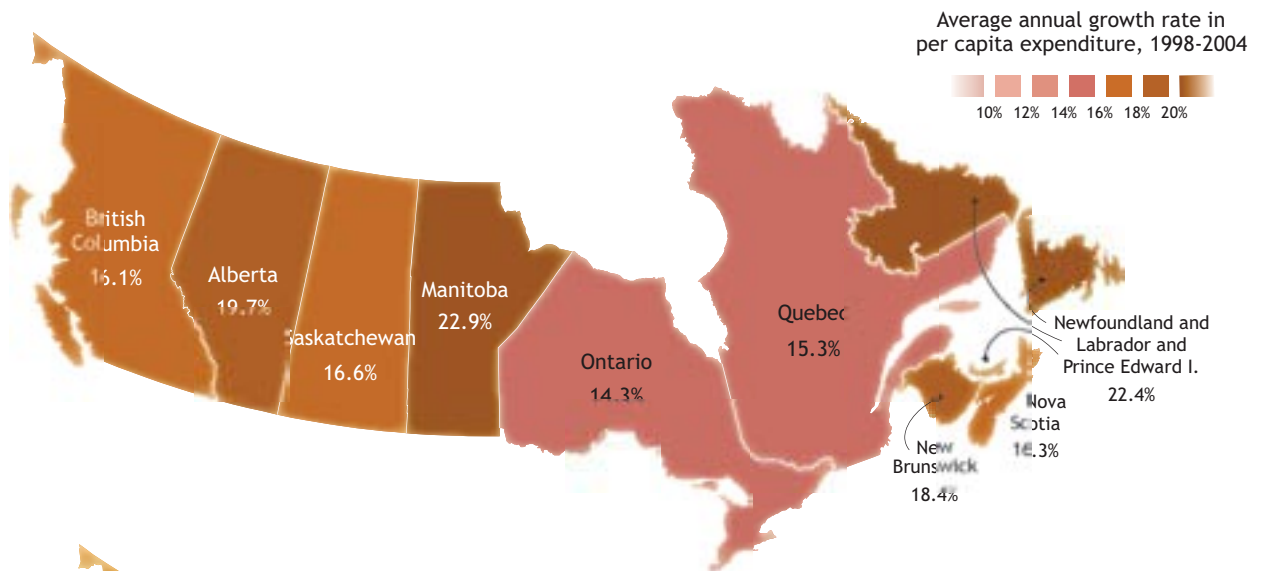
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$22	\$15	\$14	\$12	\$13	\$25	\$29	\$22	\$24	\$14
Per capita spending in 2004	\$54	\$37	\$42	\$29	\$46	\$56	\$69	\$60	\$60	\$46
Average Annual Growth (AAG)	15.7%	16.1%	19.7%	16.6%	22.9%	14.3%	15.3%	18.4%	16.3%	22.4%
AAG due to prescription volume	16.2%	17.8%	17.4%	16.5%	20.8%	13.8%	16.2%	13.1%	12.7%	18.0%
AAG due to prescription size	-0.5%	-1.4%	2.3%	-0.5%	-0.4%	-0.3%	-1.6%	3.8%	2.5%	3.2%
Subtotal Volume Effects	15.7%	16.4%	19.6%	16.0%	20.4%	13.5%	14.6%	16.9%	15.2%	21.2%
AAG due to therapeutic mix	0.3%	0.1%	0.2%	0.2%	0.7%	0.5%	0.2%	0.1%	0.2%	0.2%
AAG due to drug mix	1.6%	1.9%	2.9%	3.6%	2.1%	2.2%	2.0%	3.7%	2.7%	4.5%
Subtotal Therapeutic Choices	2.0%	2.0%	3.2%	3.8%	2.8%	2.7%	2.2%	3.8%	2.8%	4.7%
AAG due to prices	0.5%	0.0%	0.0%	-0.2%	1.6%	0.3%	-0.2%	0.2%	1.1%	0.3%
AAG due to generic use	-2.4%	-2.4%	-3.2%	-3.0%	-2.0%	-2.2%	-1.3%	-2.6%	-2.7%	-3.7%
Subtotal Price Effects	-1.9%	-2.4%	-3.1%	-3.1%	-0.4%	-1.9%	-1.5%	-2.4%	-1.7%	-3.4%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

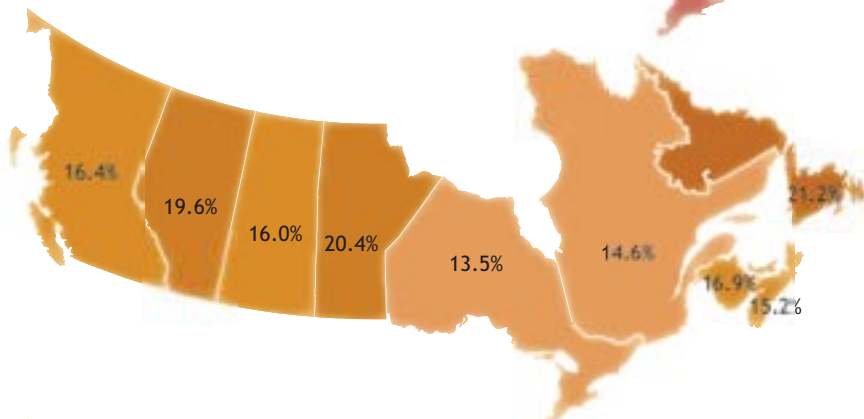
# Cholesterol Agents

Determinants of Change in Per Capita Expenditure, 1998-2004

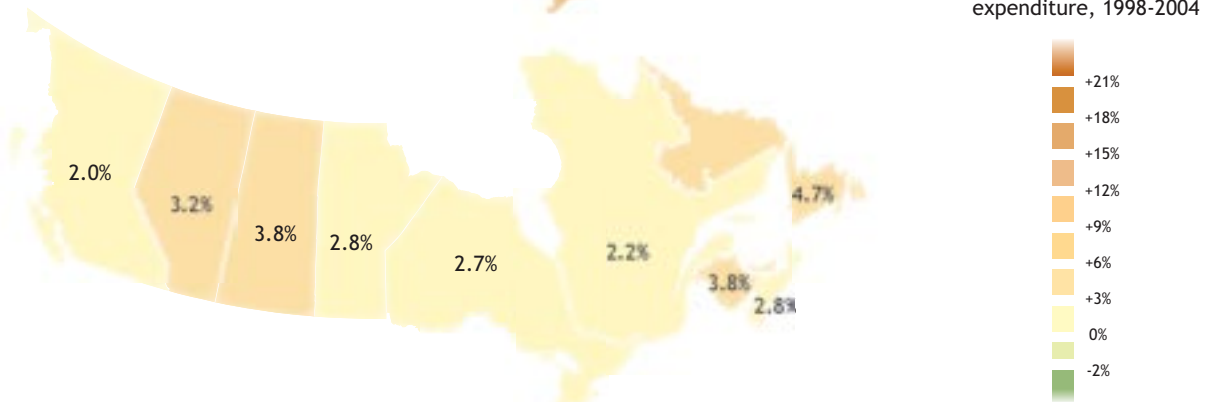
## Overall Growth Rate, 1998-2004



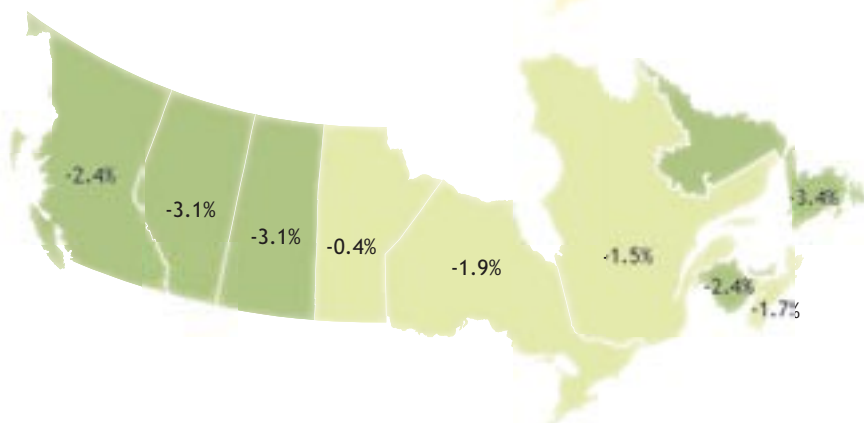
## Volume Effects



## Therapeutic Choices



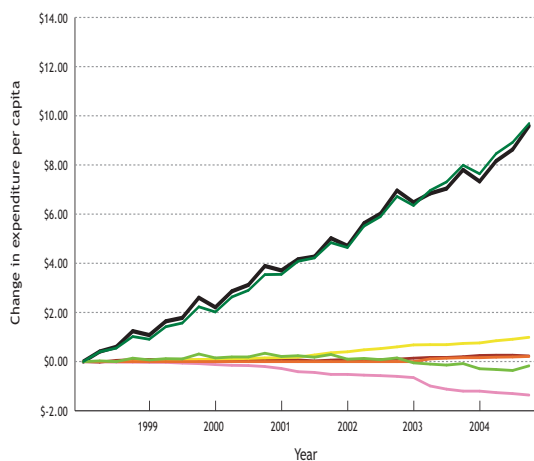
## Price Effects



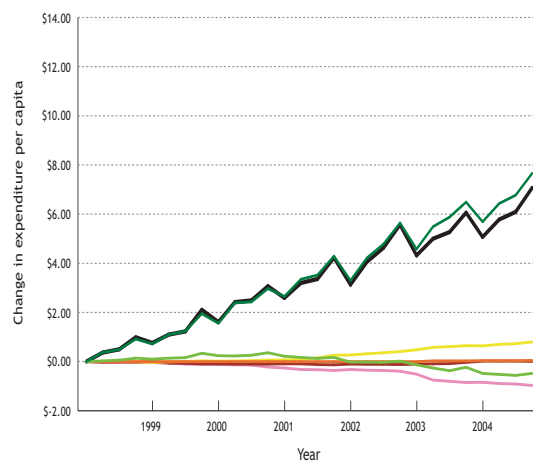
# Cholesterol Agents

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

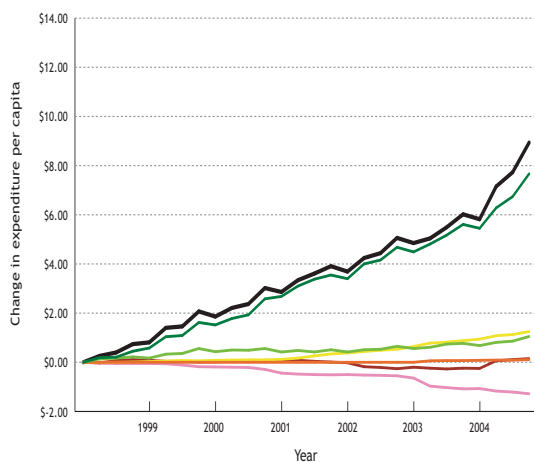
Canada



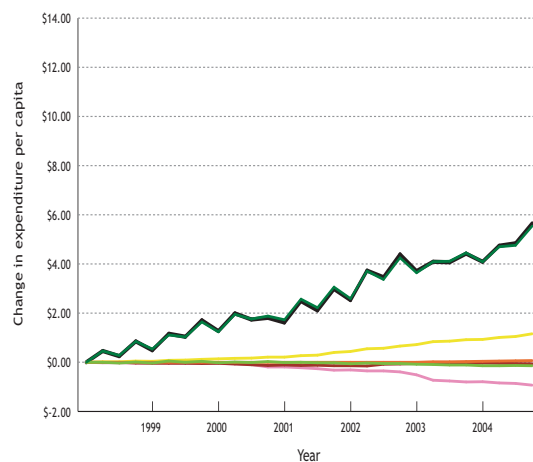
British Columbia



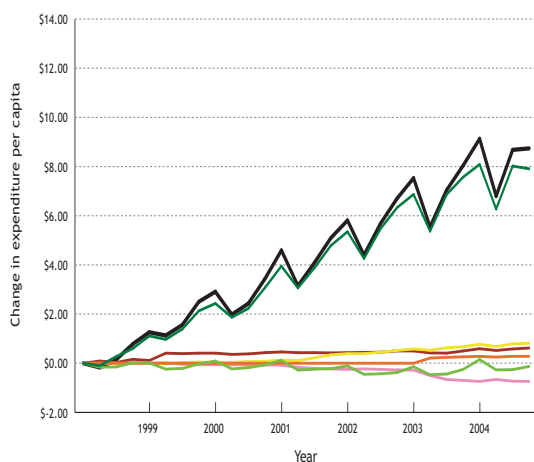
Alberta



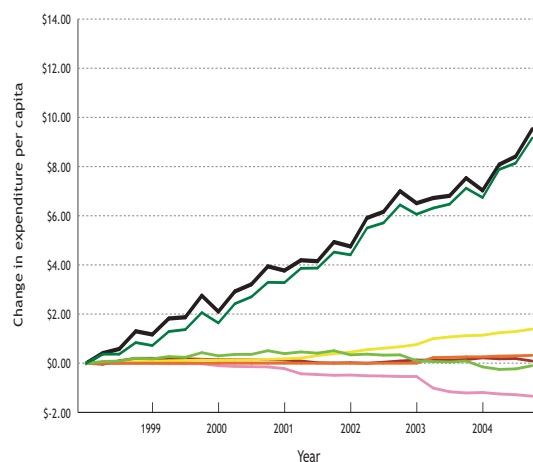
Saskatchewan



Manitoba



Ontario

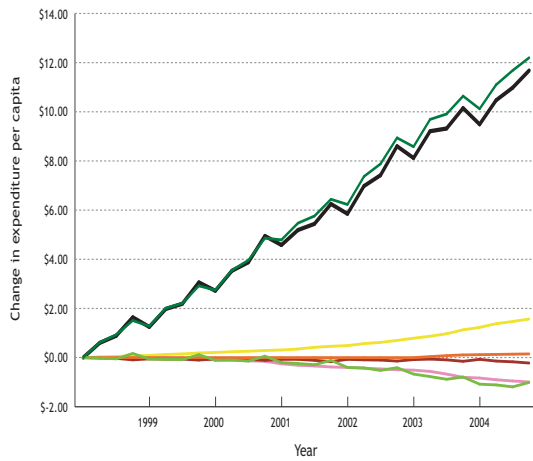


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

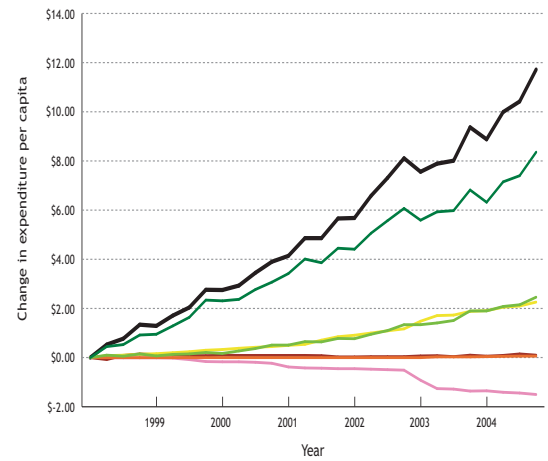
# Cholesterol Agents

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

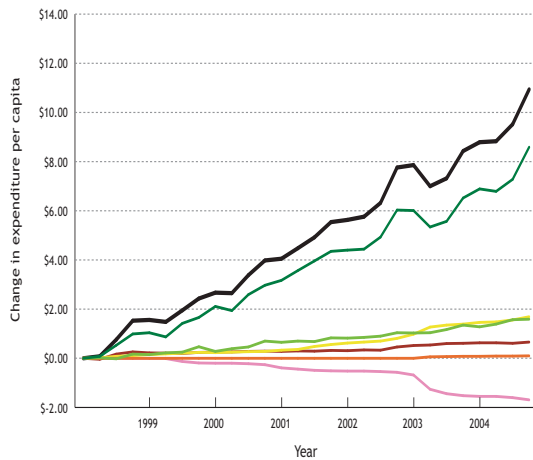
Quebec



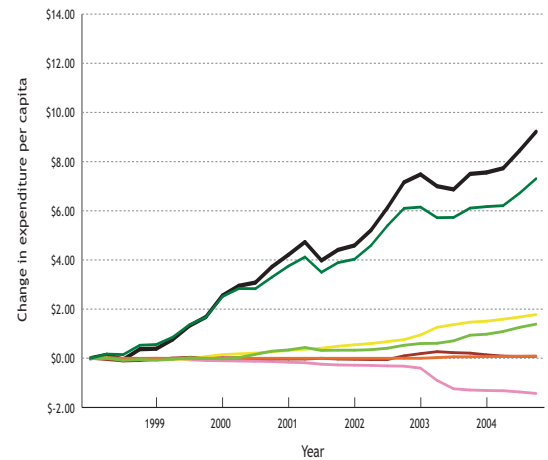
New Brunswick



Nova Scotia

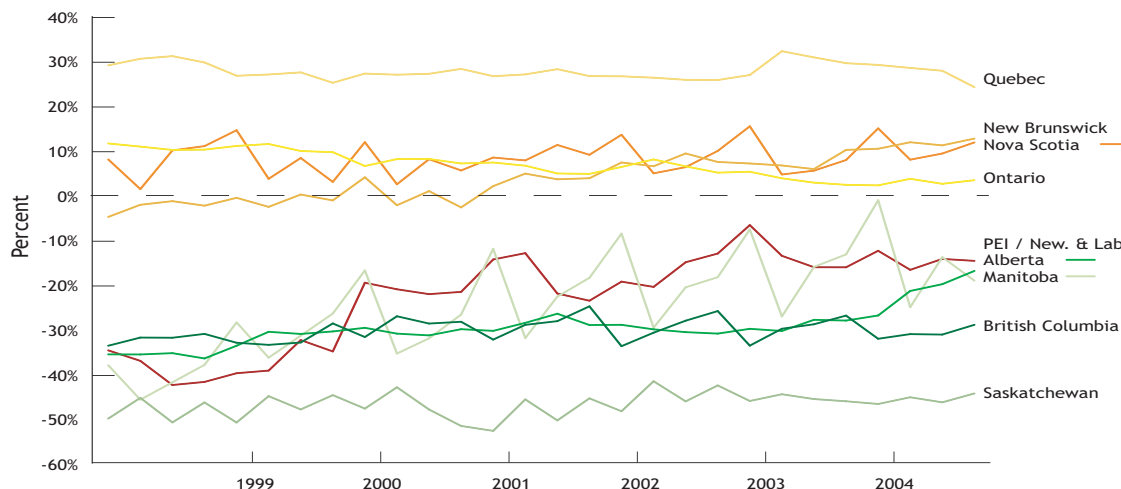


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, cholesterol drugs



# Gastrointestinal Drugs

Level of Per Capita Expenditure, 2004

## Expenditure Levels and Variations

Canadians spent \$45 per capita on gastrointestinal drugs in 2004, making this the fourth largest therapeutic category in the market. Almost all of the spending in this category is for gastrointestinal medicines used to treat ulcers, gastroesophageal reflux disease, and heartburn: proton pump inhibitors (80%), and H-2 receptor antagonists (10%).

Gastrointestinal expenditure per capita varied significantly across provinces. In 2004, per capita expenditure in the provinces varied by \$33 or 110%, from \$29 in British Columbia to \$62 in Nova Scotia. Per capita expenditure was highest in Nova Scotia from 1998 to 2004. Expenditure in British Columbia and Saskatchewan was consistently below the national average.

Therapeutic Choices also had a significant impact on provincial differences in gastrointestinal drug expenditure. British Columbia, Saskatchewan, and the Atlantic Provinces had a lower cost Therapeutic Mix, reflecting the use of more low-cost gastrointestinal drug classes (e.g., H-2 receptor antagonists) than other provinces. Residents in British Columbia also received a lower cost Drug Mix within the drug classes selected.

Price Effects did not contribute significantly to variation in expenditure on gastrointestinal drugs. Most of the difference in Prices across provinces likely reflects differences in Prescription Size. There were also differences in Generic Use, with Saskatchewan, Manitoba, and British Columbia using available generic options more often than other provinces.

## Determinants of Variation

Provincial variation in expenditure on gastrointestinal drugs is attributed primarily to Volume Effects. Populations in the Atlantic Provinces filled a greater-than-average number of prescriptions for this category of medicine, and the prescriptions they filled were much longer than average. Residents of British Columbia and Saskatchewan purchased fewer gastrointestinal drugs than the rest of Canada.

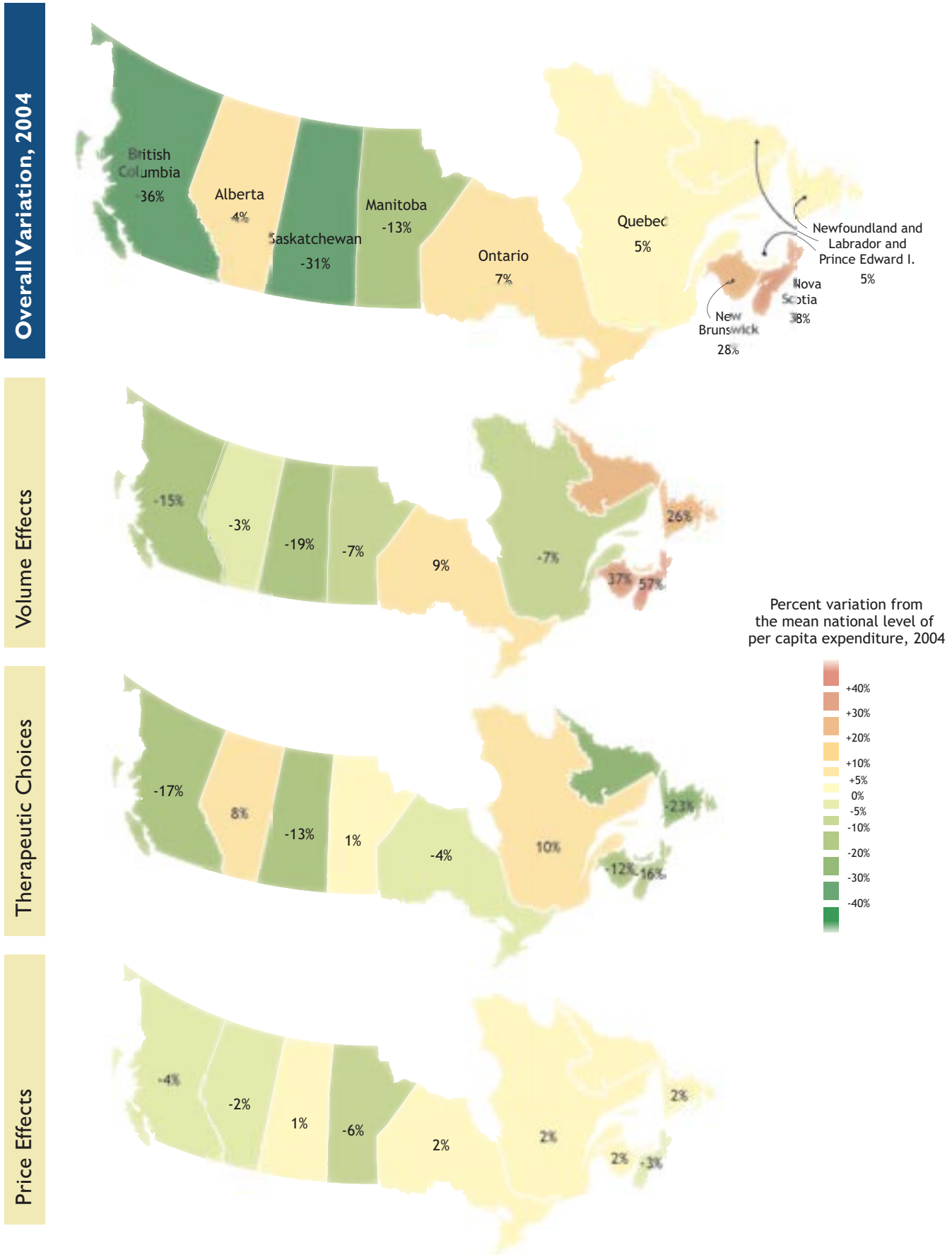
### Percent difference between provincial averages and the national average of drug expenditure, 2004, gastrointestinal drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$29	\$47	\$31	\$39	\$48	\$47	\$57	\$62	\$47
Per capita spending in Canada	\$45	\$45	\$45	\$45	\$45	\$45	\$45	\$45	\$45
<b>Total Difference</b>	<b>-35.8%</b>	<b>3.9%</b>	<b>-31.4%</b>	<b>-12.5%</b>	<b>7.2%</b>	<b>4.6%</b>	<b>27.5%</b>	<b>37.5%</b>	<b>4.5%</b>
Difference due to prescription volume	-29.4%	-24.0%	-6.1%	-6.6%	-11.8%	33.9%	11.0%	26.6%	21.2%
Difference due to prescription size	14.1%	21.5%	-13.3%	-0.4%	20.8%	-41.2%	25.9%	30.1%	4.5%
<b>Subtotal Volume Effects</b>	<b>-15.3%</b>	<b>-2.5%</b>	<b>-19.3%</b>	<b>-7.0%</b>	<b>9.0%</b>	<b>-7.3%</b>	<b>36.9%</b>	<b>56.8%</b>	<b>25.7%</b>
Difference due to therapeutic mix	-4.0%	3.1%	-11.0%	-2.4%	-4.0%	9.1%	-14.3%	-16.7%	-21.2%
Difference due to drug mix	-12.9%	4.8%	-2.0%	3.1%	-0.1%	1.2%	2.8%	0.7%	-1.6%
<b>Subtotal Therapeutic Choices</b>	<b>-17.0%</b>	<b>7.9%</b>	<b>-13.0%</b>	<b>0.8%</b>	<b>-4.1%</b>	<b>10.3%</b>	<b>-11.5%</b>	<b>-16.1%</b>	<b>-22.8%</b>
Difference due to prices	-2.2%	-2.4%	4.3%	0.5%	1.8%	0.8%	1.5%	-3.6%	1.2%
Difference due to generic use	-1.3%	0.8%	-3.3%	-6.7%	0.4%	0.9%	0.6%	0.4%	0.4%
<b>Subtotal Price Effects</b>	<b>-3.5%</b>	<b>-1.6%</b>	<b>1.0%</b>	<b>-6.2%</b>	<b>2.2%</b>	<b>1.6%</b>	<b>2.1%</b>	<b>-3.2%</b>	<b>1.6%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

# Gastrointestinal Drugs

Determinants of Variation in Per Capita Expenditure, 2004



# Gastrointestinal Drugs

Change in Per Capita Expenditure, 1998-2004

## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on gastrointestinal drugs increased by 88% from \$24 in 1998 to \$45 in 2004. Expenditure per capita grew at a rate of 11% per annum, so that by 2004 total spending on gastrointestinal drugs exceeded \$1.4 billion.

Growth in expenditure on gastrointestinal drugs was most rapid in Manitoba, Quebec, and Alberta. At the growth rates prevailing in those provinces, expenditure per capita would double every four to five years.

## Determinants of Change

Changes in expenditure on this therapeutic category between 1998 and 2004 reflect rapid increases in the use of proton pump inhibitors.

Volume Effects dominated expenditure trends in all provinces. This was largely the effect of greater Prescription Volume, with notable increases in Prescription Size within some provinces.

Therapeutic Choices also contributed to increased spending on this category of medicines. In all provinces, the trend has been toward a more costly Therapeutic Mix of drug classes within the gastrointestinal drug

market. This reflects trends toward the use of proton pump inhibitors instead of H-2 receptor antagonists. Within either of these drug categories, however, most provinces observed a trend toward selecting a less costly Drug Mix. This trend toward lower cost Drug Mix is only found in one other leading therapeutic category: antiarthritic drugs.

Price Effects had minimal impact on expenditure trends over the period of analysis. However, a generic proton pump inhibitor became available in 2004; generic savings should therefore increase in the near future.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, gastrointestinal drugs

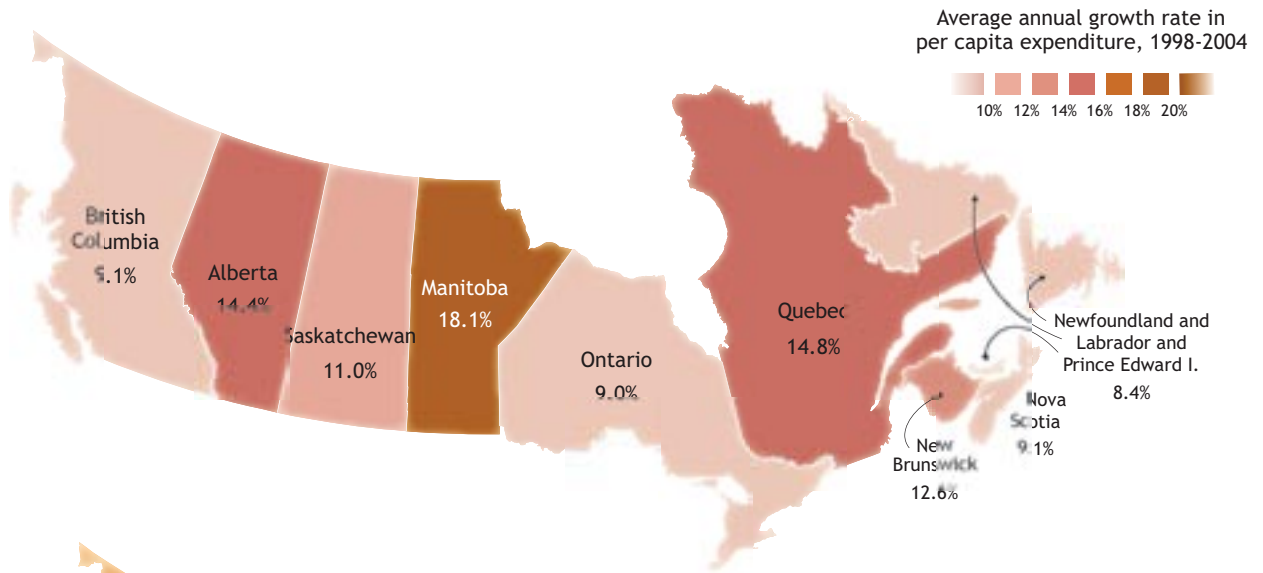
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$24	\$17	\$21	\$16	\$14	\$29	\$20	\$28	\$37	\$29
Per capita spending in 2004	\$45	\$29	\$47	\$31	\$39	\$48	\$47	\$57	\$62	\$47
Average Annual Growth (AAG)	11.2%	9.1%	14.4%	11.0%	18.1%	9.0%	14.8%	12.6%	9.1%	8.4%
AAG due to prescription volume	8.0%	6.9%	7.2%	6.6%	11.4%	5.9%	12.8%	4.4%	3.2%	3.8%
AAG due to prescription size	1.0%	2.2%	4.3%	0.7%	2.5%	1.1%	-1.1%	4.7%	4.0%	3.8%
Subtotal Volume Effects	8.9%	9.1%	11.6%	7.3%	13.9%	7.0%	11.6%	9.1%	7.2%	7.6%
AAG due to therapeutic mix	4.8%	5.4%	4.8%	6.1%	5.5%	4.8%	4.7%	5.1%	4.6%	2.8%
AAG due to drug mix	-2.5%	-5.1%	-2.1%	-2.4%	-1.3%	-3.0%	-1.6%	-1.5%	-2.7%	-2.1%
Subtotal Therapeutic Choices	2.3%	0.3%	2.7%	3.7%	4.2%	1.8%	3.1%	3.6%	1.8%	0.6%
AAG due to prices	0.3%	-0.1%	0.3%	0.3%	1.9%	0.4%	0.2%	0.2%	0.2%	0.2%
AAG due to generic use	-0.3%	-0.2%	-0.1%	-0.4%	-1.8%	-0.3%	-0.1%	-0.3%	-0.2%	-0.1%
Subtotal Price Effects	0.0%	-0.3%	0.1%	-0.1%	0.0%	0.2%	0.0%	-0.1%	0.0%	0.1%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

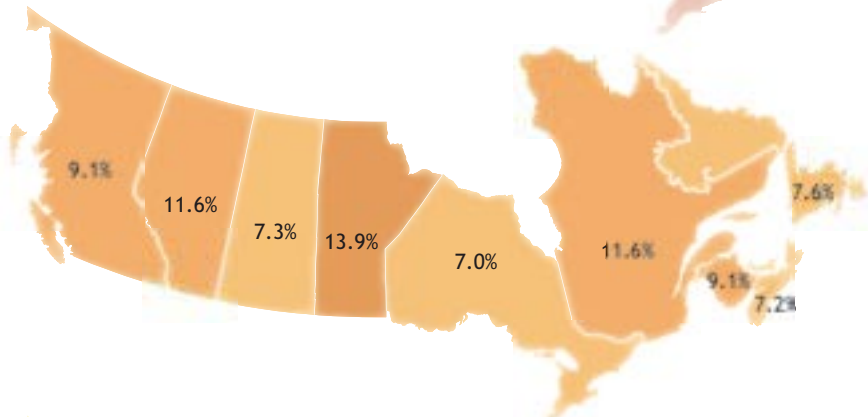
# Gastrointestinal Drugs

Determinants of Change in Per Capita Expenditure, 1998-2004

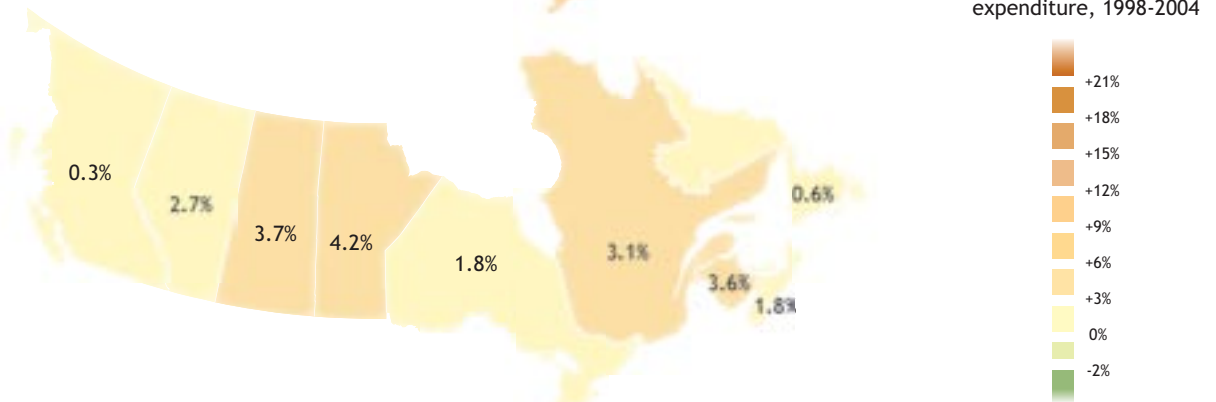
## Overall Growth Rate, 1998-2004



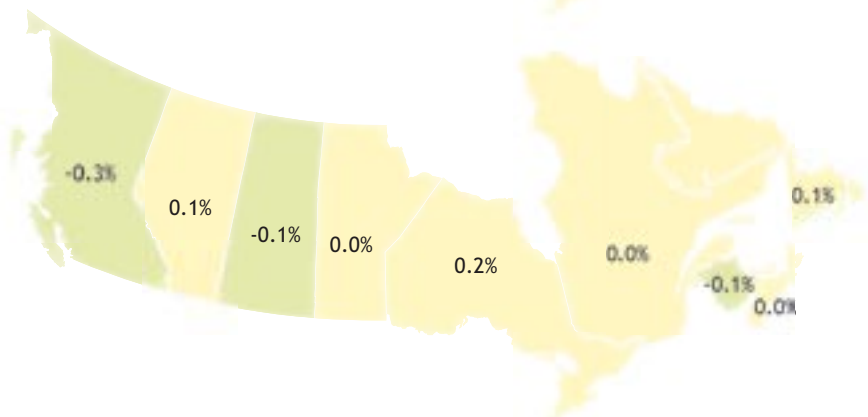
## Volume Effects



## Therapeutic Choices



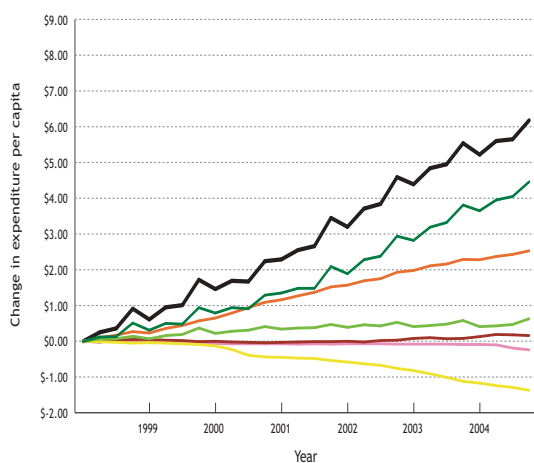
## Price Effects



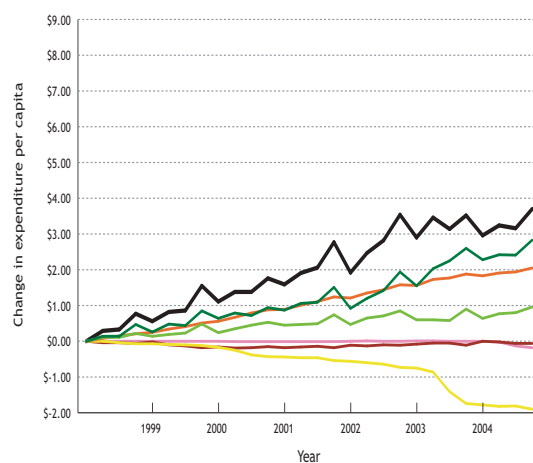
# Gastrointestinal Drugs

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

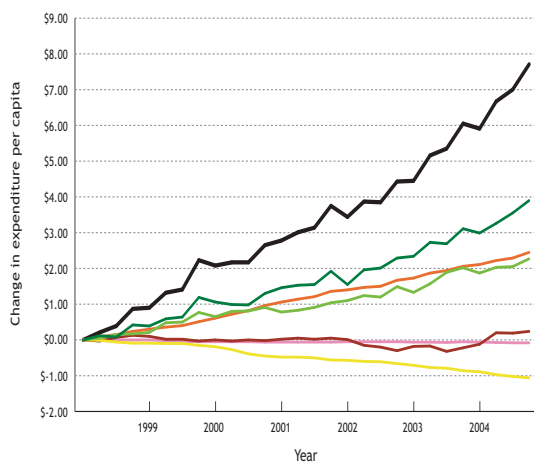
Canada



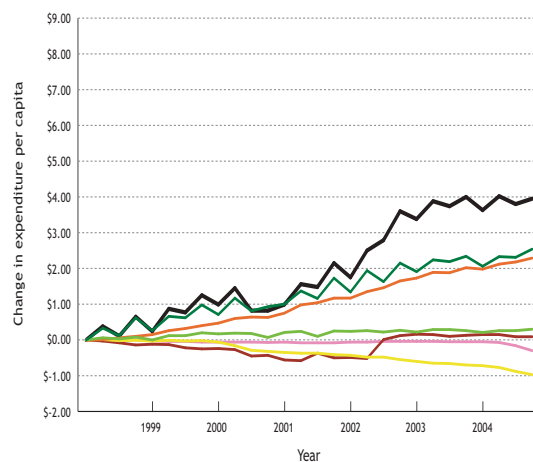
British Columbia



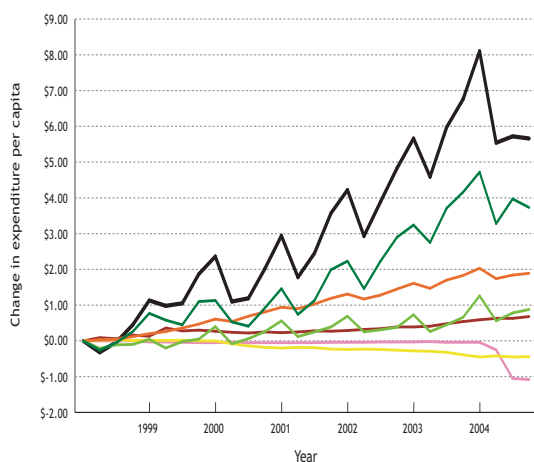
Alberta



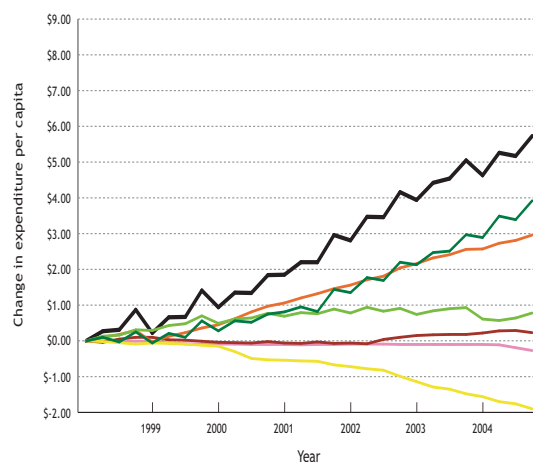
Saskatchewan



Manitoba



Ontario

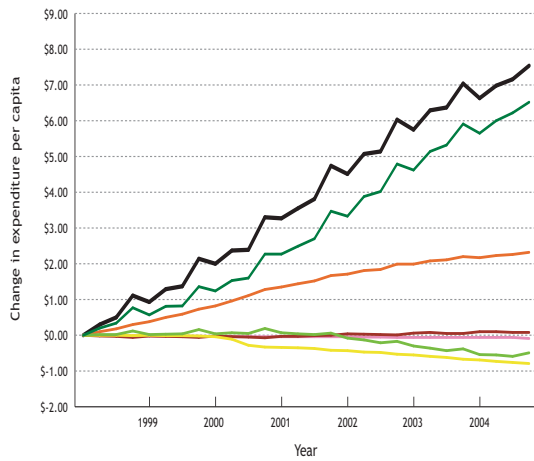


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

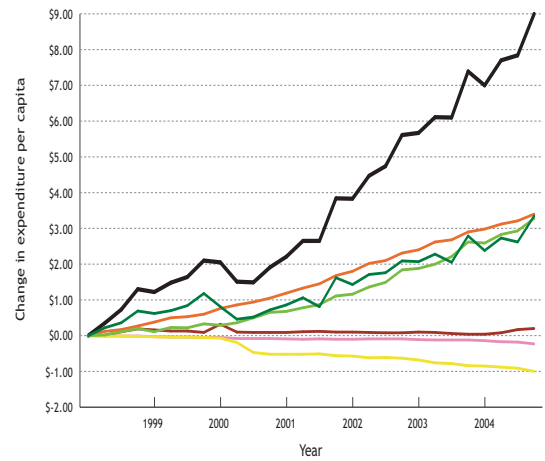
# Gastrointestinal Drugs

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

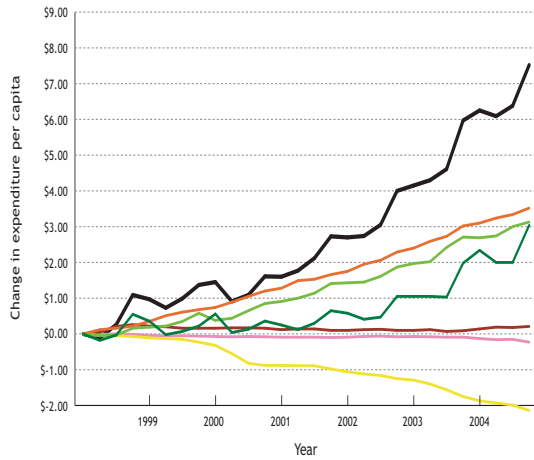
Quebec



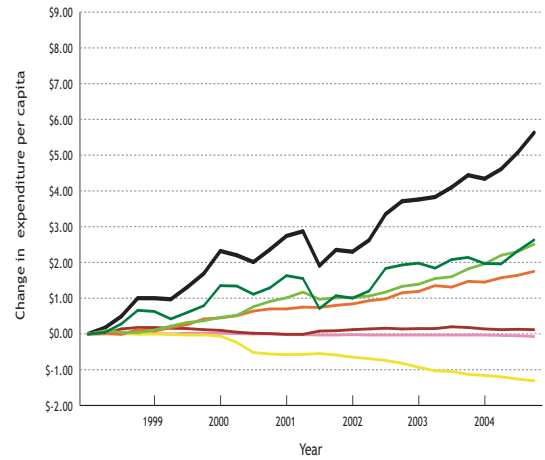
New Brunswick



Nova Scotia

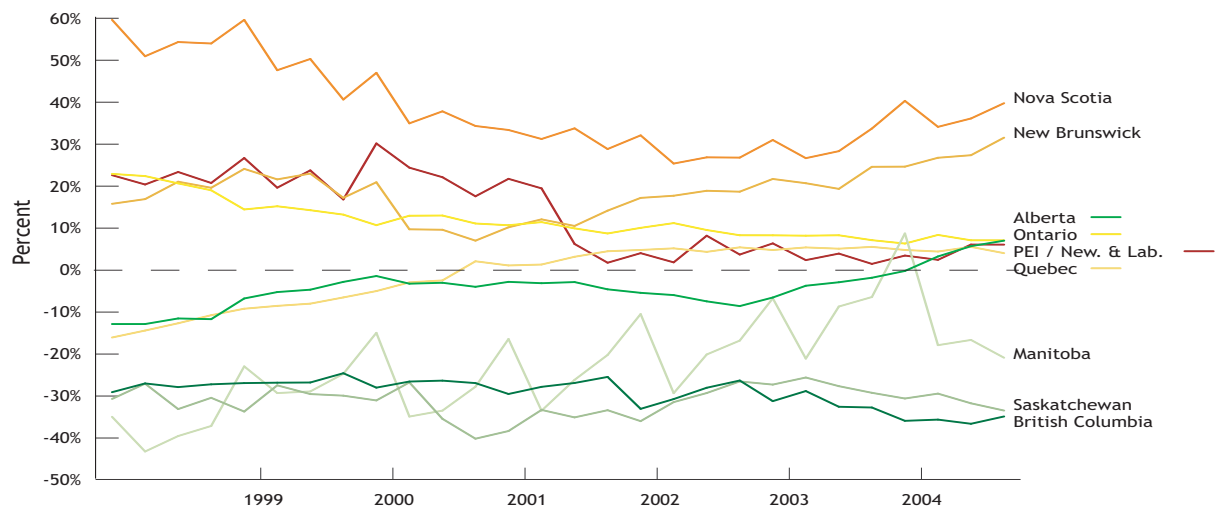


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, gastrointestinal drugs



## Expenditure Levels and Variations

In 2004, Canadians spent approximately \$22 per capita on oral solid antiinfective drugs. Spending in this category is spread relatively evenly amongst six to ten different drug classes, the largest of which is macrolides (22%).

In 2004, per capita expenditure in the provinces varied by \$10 or 56%, from \$18 in Saskatchewan to \$28 in Prince Edward Island and Newfoundland and Labrador. Per capita expenditure in Prince Edward Island and Newfoundland and Labrador was consistently above the national average from 1998 to 2004. Variation in expenditure among other provinces was less significant and less stable.

## Determinants of Variation

Both Volume Effects and Therapeutic Choices contributed moderately to provincial variation in oral solid antiinfective expenditure.

Volume Effects had the greatest impact on provincial variations. In 2004, the two most significant outliers in terms of the amount of drug used from

this category were Quebec (23% below average) and Prince Edward Island and Newfoundland and Labrador (43% above average).

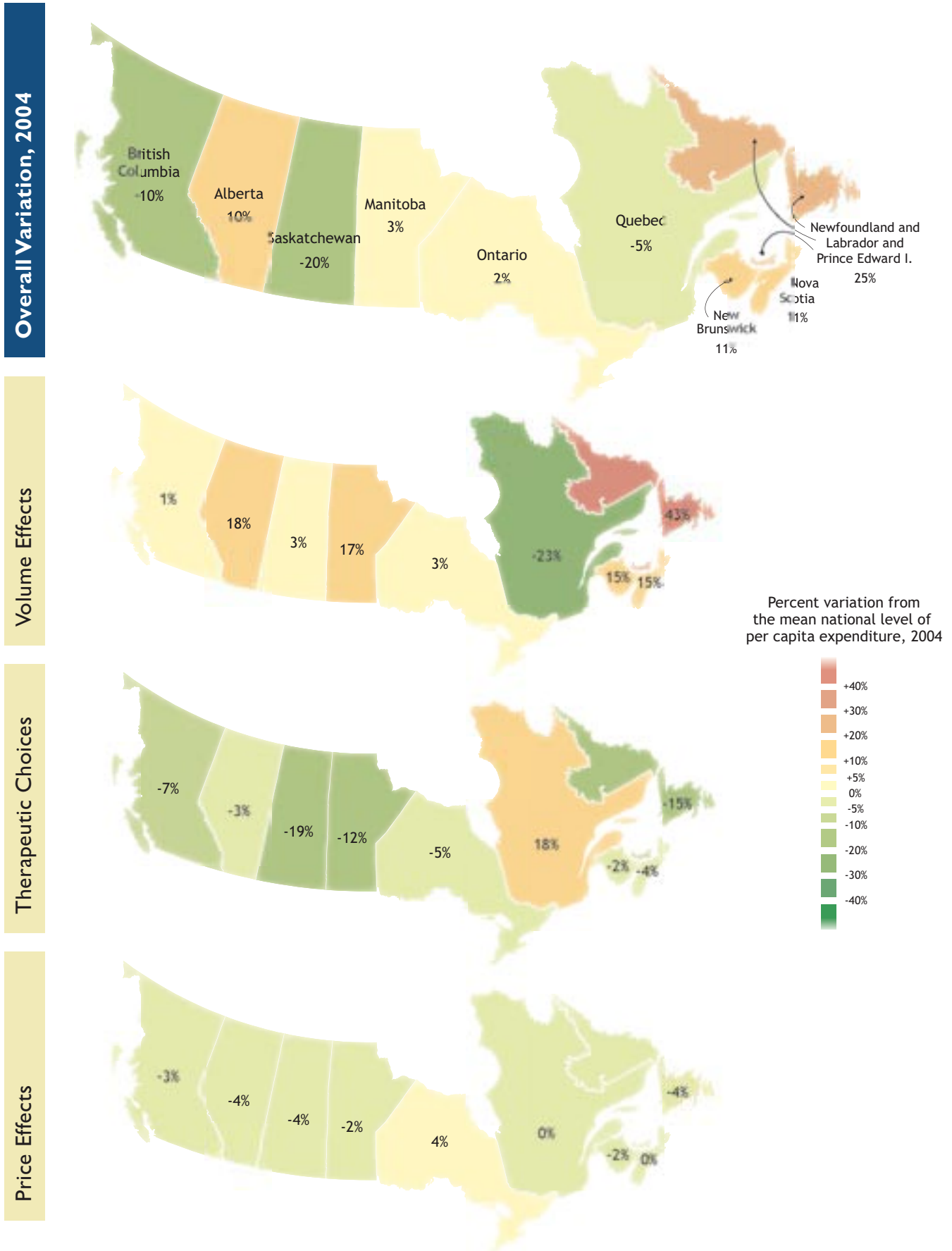
Therapeutic Choices also had a significant impact. The Therapeutic Mix of drug classes selected and the Drug Mix of products selected within drug classes were lowest in Saskatchewan, combining to make expenditure in that province approximately 19% below the national average. In Prince Edward Island and Newfoundland and Labrador, where utilization was above average, the cost of Therapeutic Choices was also below the national average (by roughly 15%).

Price Effects had relatively little impact on provincial variations in expenditure on antiinfective drugs.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, antiinfective drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$20	\$24	\$18	\$23	\$23	\$21	\$25	\$24	\$28
Per capita spending in Canada	\$22	\$22	\$22	\$22	\$22	\$22	\$22	\$22	\$22
<b>Total Difference</b>	<b>-10.0%</b>	<b>10.3%</b>	<b>-20.1%</b>	<b>2.8%</b>	<b>2.1%</b>	<b>-4.8%</b>	<b>11.3%</b>	<b>10.6%</b>	<b>24.9%</b>
Difference due to prescription volume	-0.4%	14.7%	7.1%	18.1%	-2.0%	-13.5%	8.1%	10.7%	39.4%
Difference due to prescription size	1.0%	2.9%	-4.1%	-1.5%	5.1%	-9.2%	6.4%	3.9%	3.8%
<b>Subtotal Volume Effects</b>	<b>0.6%</b>	<b>17.7%</b>	<b>3.0%</b>	<b>16.6%</b>	<b>3.1%</b>	<b>-22.6%</b>	<b>14.5%</b>	<b>14.6%</b>	<b>43.2%</b>
Difference due to therapeutic mix	-5.5%	-1.8%	-12.3%	-9.3%	-3.6%	11.7%	3.8%	-1.7%	-9.2%
Difference due to drug mix	-1.9%	-1.1%	-6.9%	-2.3%	-1.5%	6.4%	-5.5%	-1.9%	-5.3%
<b>Subtotal Therapeutic Choices</b>	<b>-7.4%</b>	<b>-2.9%</b>	<b>-19.2%</b>	<b>-11.6%</b>	<b>-5.1%</b>	<b>18.1%</b>	<b>-1.7%</b>	<b>-3.6%</b>	<b>-14.5%</b>
Difference due to prices	-1.3%	-3.1%	-0.5%	-0.9%	2.5%	-0.7%	-0.5%	0.4%	-2.0%
Difference due to generic use	-2.0%	-1.3%	-3.4%	-1.3%	1.6%	0.5%	-1.0%	-0.8%	-1.8%
<b>Subtotal Price Effects</b>	<b>-3.2%</b>	<b>-4.4%</b>	<b>-4.0%</b>	<b>-2.3%</b>	<b>4.1%</b>	<b>-0.2%</b>	<b>-1.5%</b>	<b>-0.4%</b>	<b>-3.8%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).



## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on oral solid antiinfective drugs increased by 14% from \$19 in 1998 to \$22 in 2004. The average annual growth rate for per capita expenditure was just over 2%, making this the slowest growing major therapeutic category of drugs in Canada.

Notwithstanding rapid growth in Manitoba, the rate of change in expenditure on oral solid antiinfective drugs was comparable across provinces.

## Determinants of Change

Prescription Volume for antiinfectives displayed strong seasonality: far more prescriptions for these medicines are dispensed in the first and fourth quarter of each year, reflecting seasonality of infections often treated with oral antiinfectives.

Between 1998 and 2004, Volume Effects caused annual per capita expenditure on oral solid antiinfective drugs to fall in most provinces. Except for in Saskatchewan, Manitoba, and Ontario, fewer antiinfective prescriptions per capita were filled in 2004 than in 1998.

Despite changes in the volume of drug purchased, the cost of Therapeutic Choices increased substantially in most provinces. Most of the change in the cost of drugs selected stemmed from changes in the Therapeutic Mix of drug classes. The selection of more costly drug classes caused expenditure per capita in New Brunswick to rise by over 20% per year.

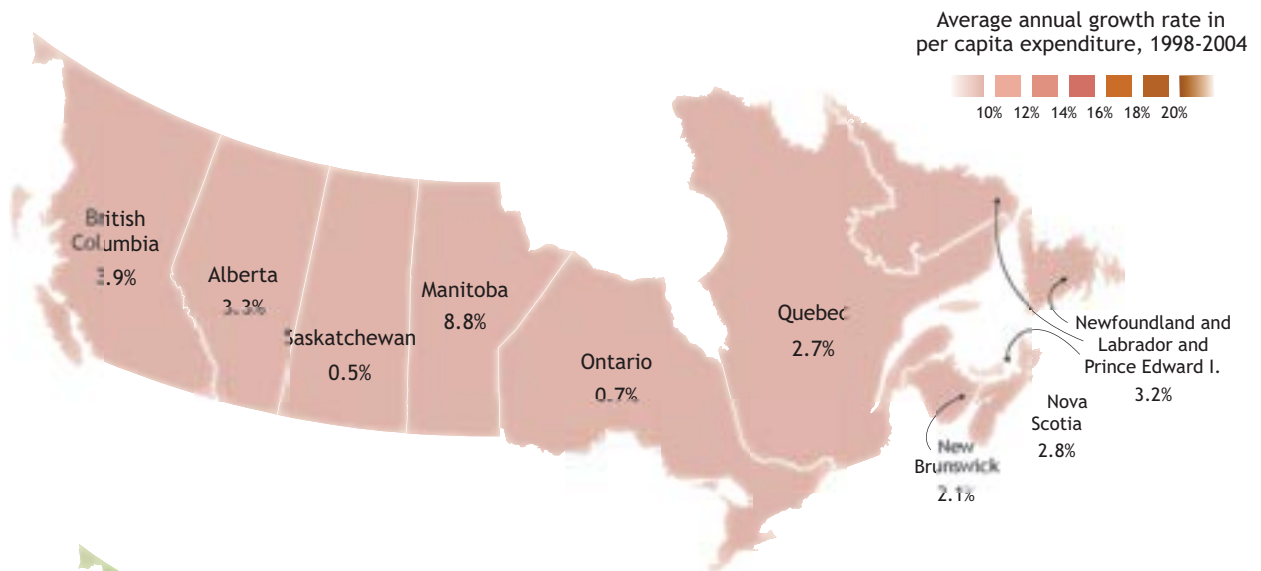
Price Effects had relatively little impact on antiinfective expenditure in the provinces. Prices increased slightly in most provinces, while increased generic substitutions generated modest savings over time.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, antiinfective drugs

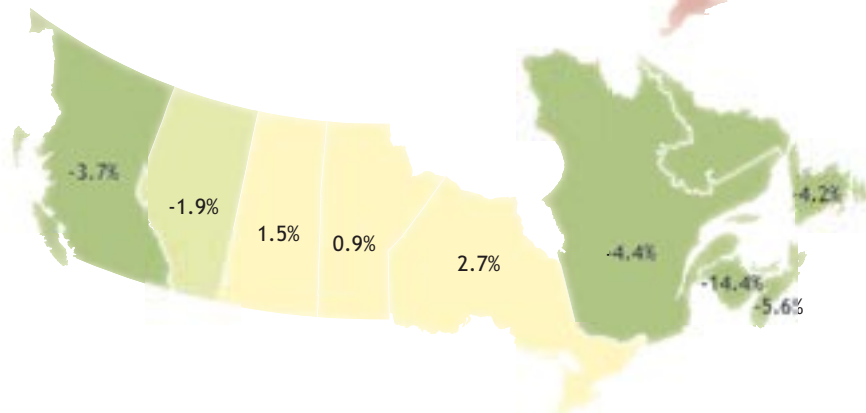
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$19	\$16	\$20	\$17	\$14	\$22	\$18	\$22	\$21	\$23
Per capita spending in 2004	\$22	\$20	\$24	\$18	\$23	\$23	\$21	\$25	\$24	\$28
Average Annual Growth (AAG)	2.2%	3.9%	3.3%	0.5%	8.8%	0.7%	2.7%	2.1%	2.8%	3.2%
AAG due to prescription volume	-8.4%	-4.5%	-3.2%	1.5%	0.7%	2.6%	-4.3%	-17.1%	-7.6%	-3.9%
AAG due to prescription size	-0.1%	0.8%	1.4%	0.0%	0.2%	0.0%	-0.1%	2.7%	2.0%	-0.2%
Subtotal Volume Effects	-8.4%	-3.7%	-1.9%	1.5%	0.9%	2.7%	-4.4%	-14.4%	-5.6%	-4.2%
AAG due to therapeutic mix	9.8%	7.8%	5.0%	-1.0%	5.6%	-1.8%	6.4%	22.1%	8.5%	6.4%
AAG due to drug mix	1.9%	1.0%	1.4%	-0.2%	0.5%	-0.3%	1.9%	-0.2%	1.7%	1.2%
Subtotal Therapeutic Choices	11.7%	8.8%	6.5%	-1.3%	6.1%	-2.1%	8.3%	21.8%	10.2%	7.7%
AAG due to prices	2.6%	2.0%	1.2%	-0.2%	3.3%	-0.6%	0.6%	2.7%	1.5%	2.6%
AAG due to generic use	-3.7%	-3.2%	-2.5%	0.4%	-1.6%	0.7%	-1.8%	-8.0%	-3.3%	-3.0%
Subtotal Price Effects	-1.1%	-1.2%	-1.3%	0.2%	1.8%	0.1%	-1.2%	-5.4%	-1.7%	-0.3%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

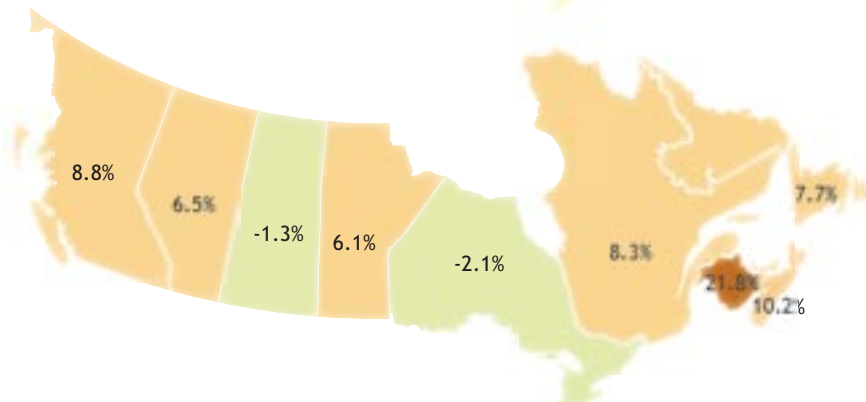
### Overall Growth Rate, 1998-2004



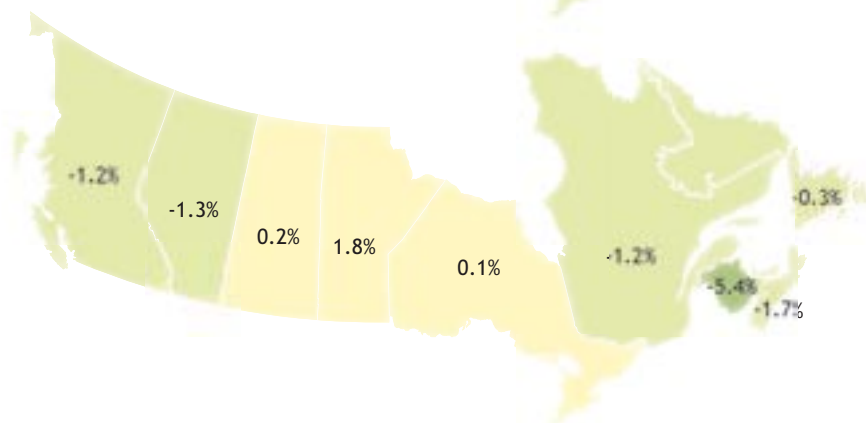
### Volume Effects



### Therapeutic Choices



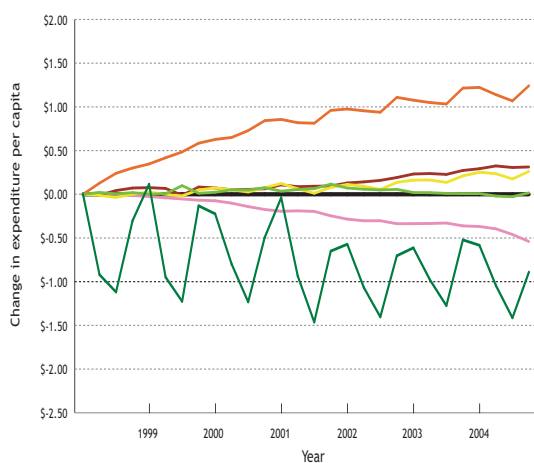
### Price Effects



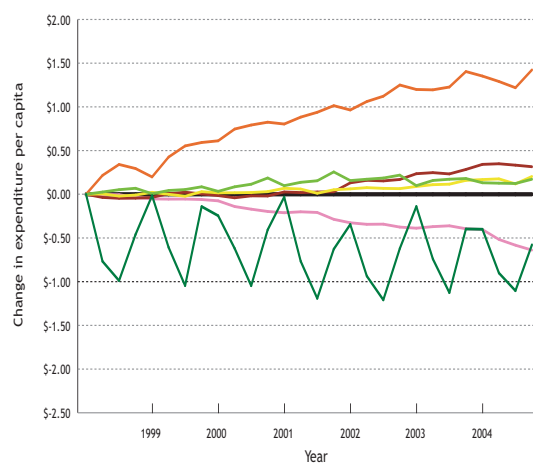
# Antiinfectives

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

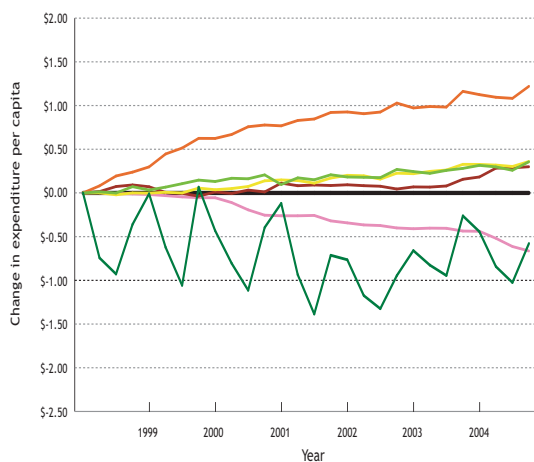
Canada



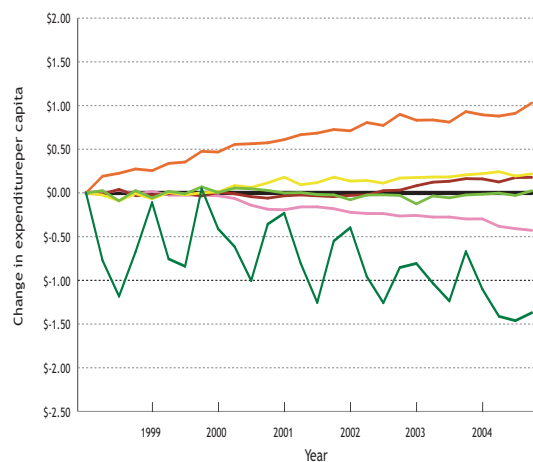
British Columbia



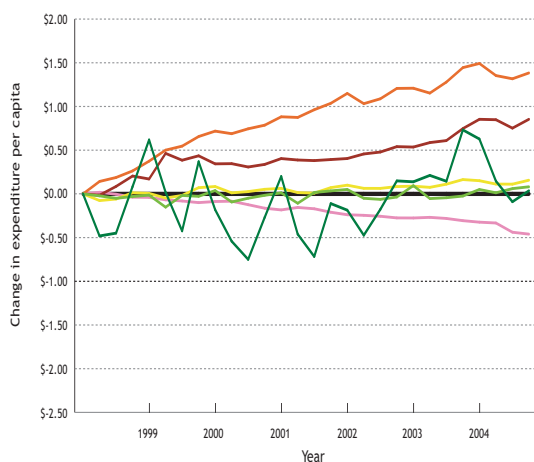
Alberta



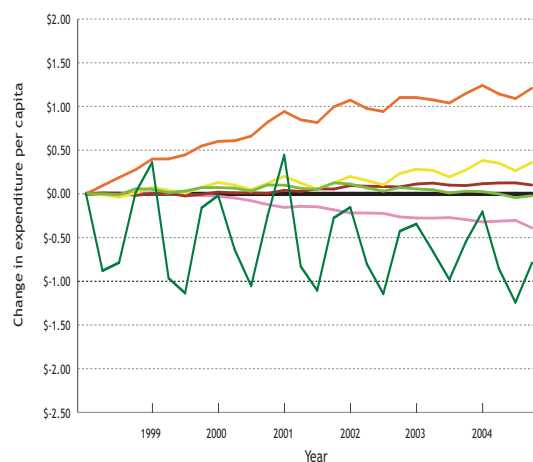
Saskatchewan



Manitoba

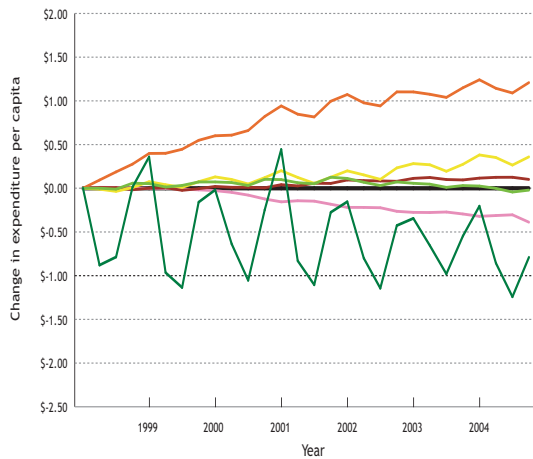


Ontario

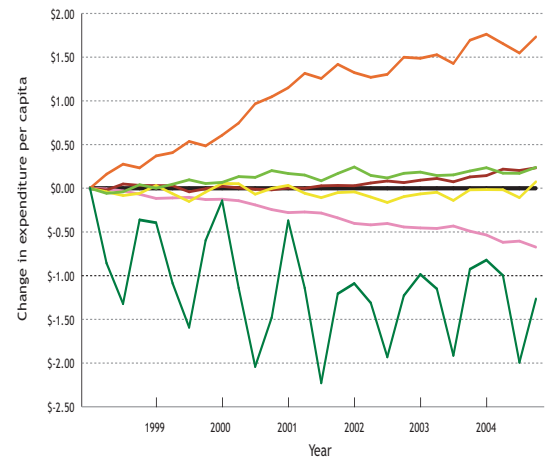


Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

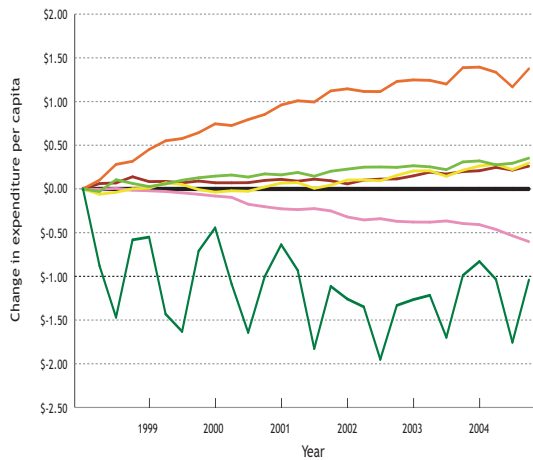
Quebec



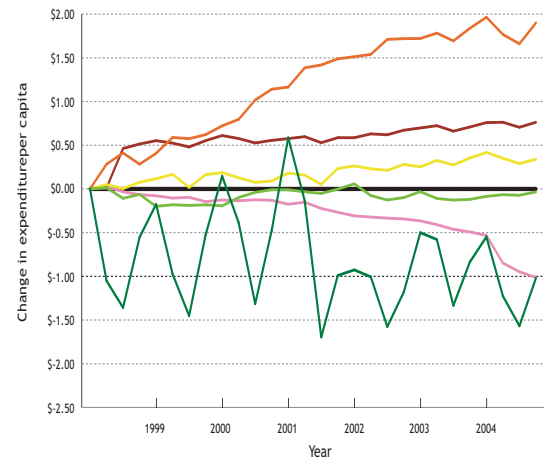
New Brunswick



Nova Scotia

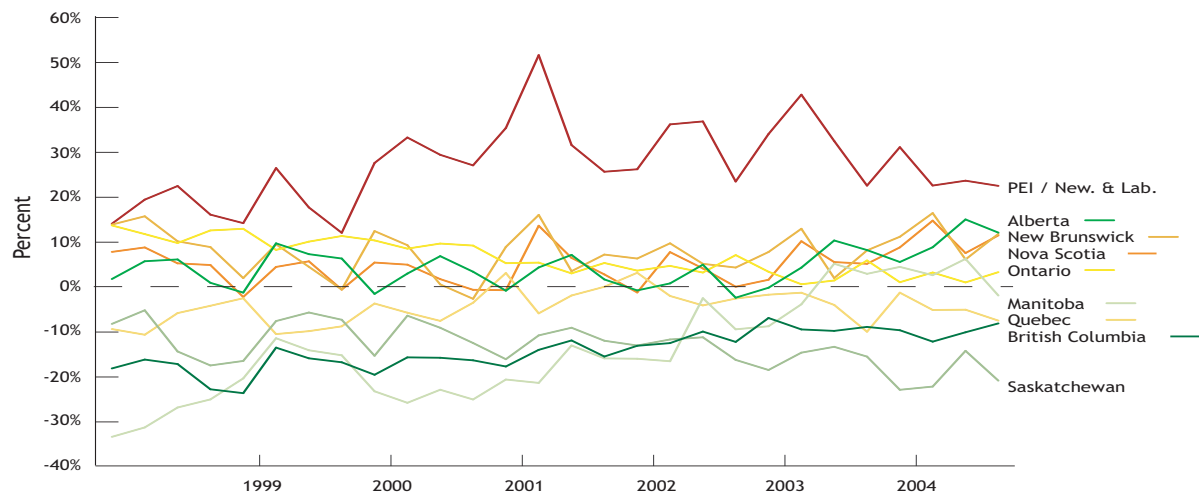


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

### Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, antiinfective drugs



## Expenditure Levels and Variations

Canadians spent \$21 per capita on oral solid antiarthritic medicines in 2004, making them the sixth largest therapeutic category. A vast majority of the expenditure in this category is on cyclooxygenase-2 (COX-2) inhibitors (70%) and prescription nonsteroidal anti-inflammatory drugs (20%).

Expenditure per capita on oral solid antiarthritic medicines was consistently lowest in British Columbia and highest in New Brunswick.

## Determinants of Variation

The majority of variation across provinces is attributed to differences in Volume Effects; however, Therapeutic Choices and Price Effects also varied.

In New Brunswick, higher-than-average Prescription Volume dispensed and larger-than-average Prescription Sizes resulted in per capita expenditure that was 37% above national average. Conversely, lower-than-average Volume Effects in British Columbia resulted in per capita expenditure that was 19% below the national average.

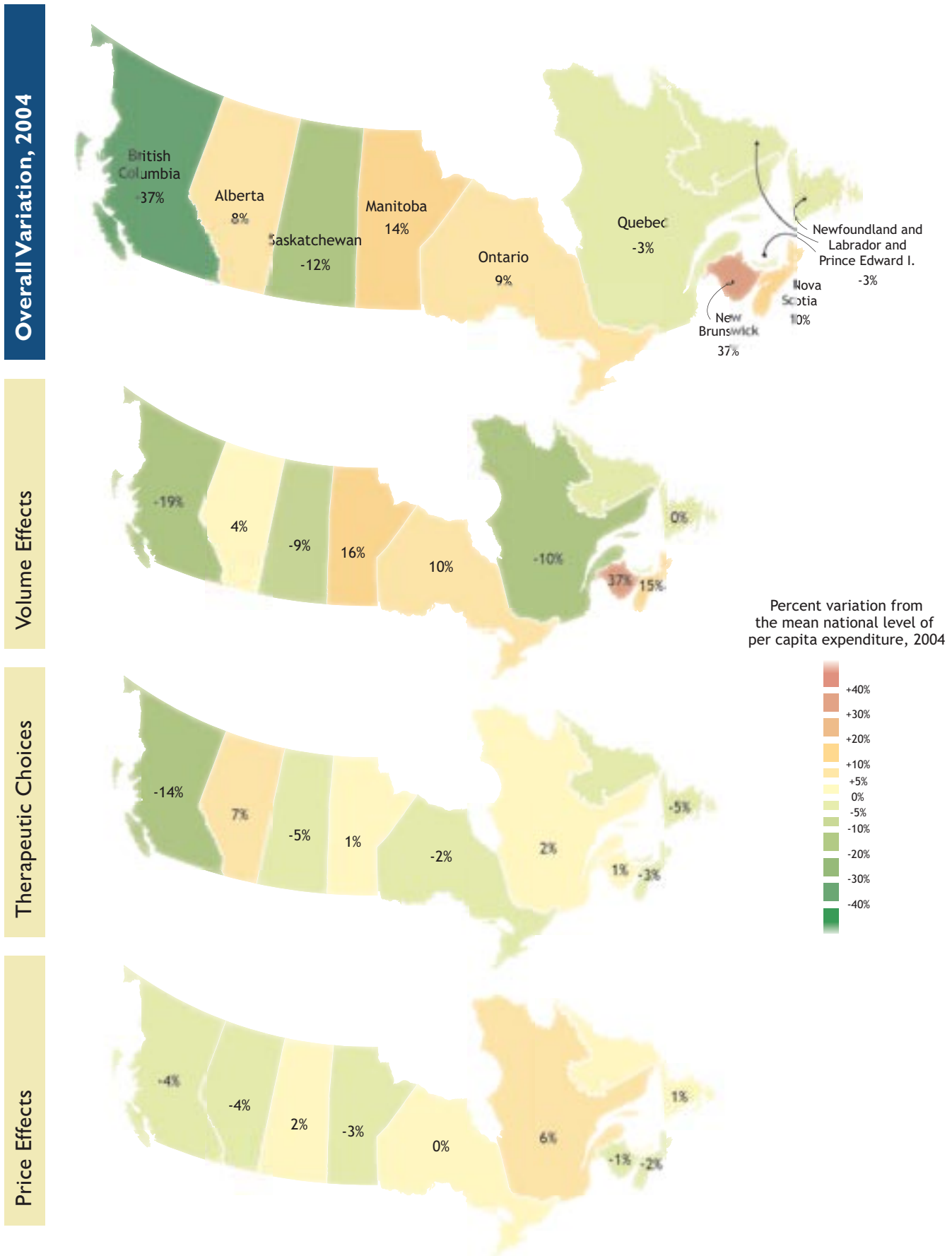
Therapeutic choices had a moderate effect on provincial variations in antiarthritic expenditure per capita. Notably, a relatively inexpensive Therapeutic Mix of drug classes chosen (-11%) and the selection of a relatively inexpensive Drug Mix from within those drug classes (-3%) pushed per capita expenditure in British Columbia even further below the national average than utilization rates alone. Most of the difference is due to lower-than-average use of COX-2 inhibitors in British Columbia.

Price Effects had a modest effect on provincial variation in expenditure on antiarthritic drugs. Most of this variation stemmed from differences in Prices per unit of drug, which were likely driven by differences in Prescription Size.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, antiarthritic drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$13	\$22	\$18	\$24	\$22	\$20	\$28	\$23	\$20
Per capita spending in Canada	\$21	\$21	\$21	\$21	\$21	\$21	\$21	\$21	\$21
<b>Total Difference</b>	<b>-36.7%</b>	<b>7.6%</b>	<b>-12.2%</b>	<b>14.1%</b>	<b>8.8%</b>	<b>-2.6%</b>	<b>36.6%</b>	<b>10.4%</b>	<b>-3.3%</b>
Difference due to prescription volume	-29.9%	-17.8%	1.3%	10.0%	-6.2%	27.6%	9.1%	-6.7%	-6.9%
Difference due to prescription size	10.6%	21.8%	-10.4%	5.7%	16.4%	-37.8%	28.3%	22.1%	6.9%
<b>Subtotal Volume Effects</b>	<b>-19.3%</b>	<b>4.0%</b>	<b>-9.1%</b>	<b>15.7%</b>	<b>10.2%</b>	<b>-10.3%</b>	<b>37.4%</b>	<b>15.3%</b>	<b>0.0%</b>
Difference due to therapeutic mix	-11.0%	-0.5%	-12.0%	-2.7%	3.3%	1.0%	3.9%	-4.1%	-8.4%
Difference due to drug mix	-2.6%	7.8%	7.2%	3.8%	-4.9%	0.7%	-3.3%	1.2%	3.8%
<b>Subtotal Therapeutic Choices</b>	<b>-13.6%</b>	<b>7.3%</b>	<b>-4.8%</b>	<b>1.0%</b>	<b>-1.6%</b>	<b>1.8%</b>	<b>0.6%</b>	<b>-2.9%</b>	<b>-4.6%</b>
Difference due to prices	-2.7%	-2.6%	4.4%	-0.6%	-0.6%	4.3%	-0.2%	-0.8%	3.1%
Difference due to generic use	-1.1%	-1.1%	-2.6%	-1.9%	0.7%	1.6%	-1.2%	-1.2%	-1.8%
<b>Subtotal Price Effects</b>	<b>-3.8%</b>	<b>-3.7%</b>	<b>1.8%</b>	<b>-2.6%</b>	<b>0.2%</b>	<b>5.9%</b>	<b>-1.4%</b>	<b>-2.0%</b>	<b>1.4%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).



# Antiarthritics

Change in Per Capita Expenditure, 1998-2004

## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on arthritis drugs more than doubled from \$9 in 1998 to \$21 in 2004. The average annual growth in per capita expenditure was approximately 14%, a rate at which per capita spending doubles in five years.

Despite very different levels of expenditure, growth in per capita expenditure on antiarthritic drugs was rapid in all provinces. Annual growth in spending per capita ranged from 11.7% in Saskatchewan to 18.6% in Manitoba.

## Determinants of Change

The determinants of change in arthritis drug expenditure are relatively consistent across Canada: increases in Volume Effects and Therapeutic Choices were significant in all provinces.

The volume of prescriptions dispensed increased in all provinces. The rise in Prescription Volume was particularly rapid between 1999 and 2002, when COX-2 inhibitors were first launched on the Canadian market. Growth in the use of COX-2 inhibitors also had the effect of increasing Prescription Size in all provinces.

The rapid uptake of COX-2 inhibitors also affected Therapeutic Choices in this category of medicine. In particular, all provinces experienced a significant increase in the cost of the Therapeutic Mix of drug classes selected because COX-2 inhibitors are more expensive than other prescription NSAIDs. Set against this trend was a slight reduction in the cost of the Drug Mix chosen from within drug classes. This trend toward a lower cost Drug Mix is only found in one other leading therapeutic category: gastrointestinal drugs.

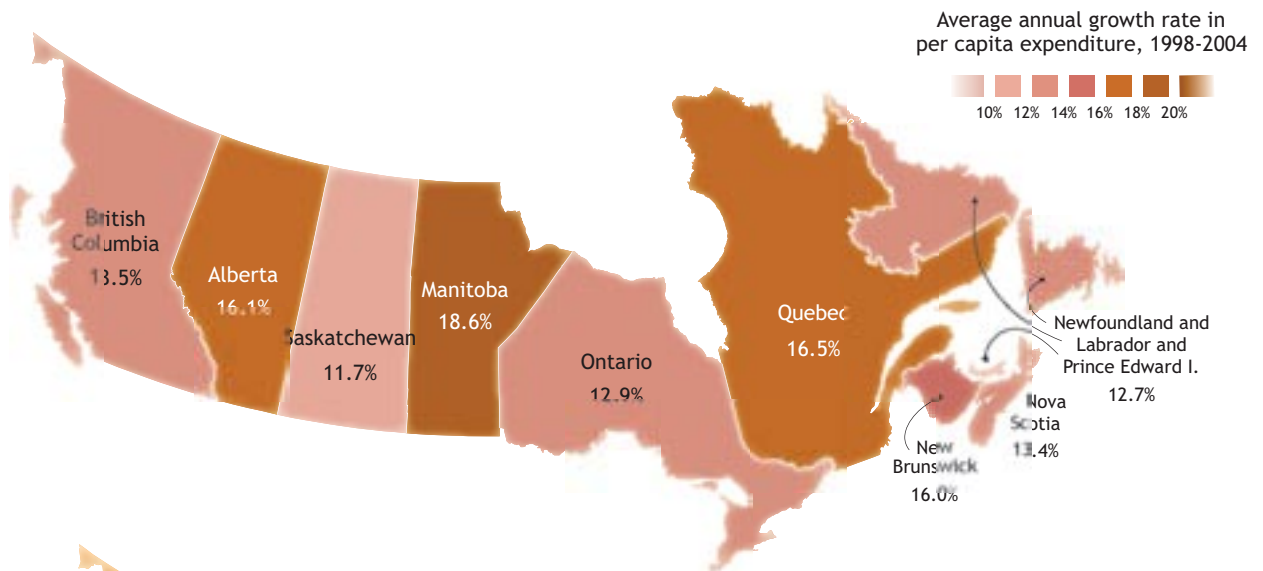
Price Effects generated small savings on antiarthritic drugs, most of which resulted from increased Generic Use.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, antiarthritic drugs

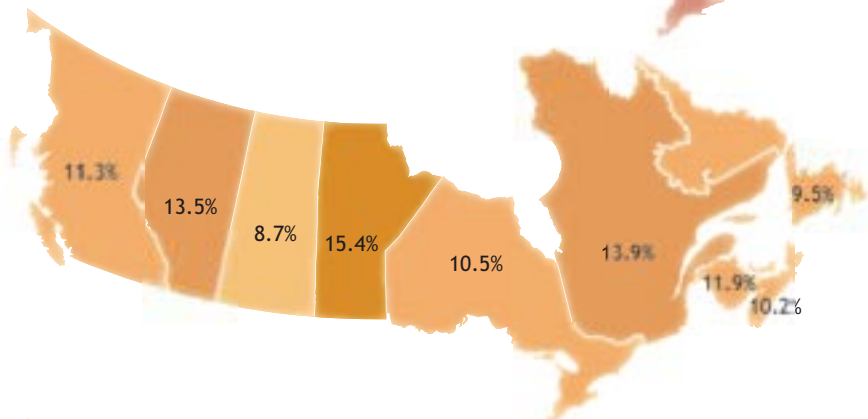
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$9	\$6	\$9	\$9	\$8	\$11	\$8	\$12	\$11	\$10
Per capita spending in 2004	\$21	\$13	\$22	\$18	\$24	\$22	\$20	\$28	\$23	\$20
Average Annual Growth (AAG)	14.4%	13.5%	16.1%	11.7%	18.6%	12.9%	16.5%	16.0%	13.4%	12.7%
AAG due to prescription volume	6.8%	5.6%	5.8%	5.4%	8.0%	5.9%	9.4%	5.2%	4.0%	3.7%
AAG due to prescription size	4.9%	5.6%	7.7%	3.3%	7.4%	4.6%	4.5%	6.7%	6.2%	5.8%
Subtotal Volume Effects	11.7%	11.3%	13.5%	8.7%	15.4%	10.5%	13.9%	11.9%	10.2%	9.5%
AAG due to therapeutic mix	5.2%	4.4%	4.8%	4.7%	5.2%	5.9%	4.6%	7.1%	5.3%	4.9%
AAG due to drug mix	-0.9%	-0.9%	-0.7%	-0.4%	-2.0%	-1.4%	-0.5%	-1.5%	-1.5%	-1.6%
Subtotal Therapeutic Choices	4.3%	3.5%	4.1%	4.3%	3.2%	4.5%	4.1%	5.6%	3.8%	3.3%
AAG due to prices	-0.6%	-0.2%	-0.8%	-0.1%	0.7%	-0.8%	-0.9%	-0.4%	0.4%	0.4%
AAG due to generic use	-1.1%	-1.1%	-0.8%	-1.2%	-0.8%	-1.3%	-0.6%	-1.1%	-1.0%	-0.5%
Subtotal Price Effects	-1.6%	-1.3%	-1.6%	-1.3%	-0.1%	-2.1%	-1.5%	-1.5%	-0.5%	-0.1%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

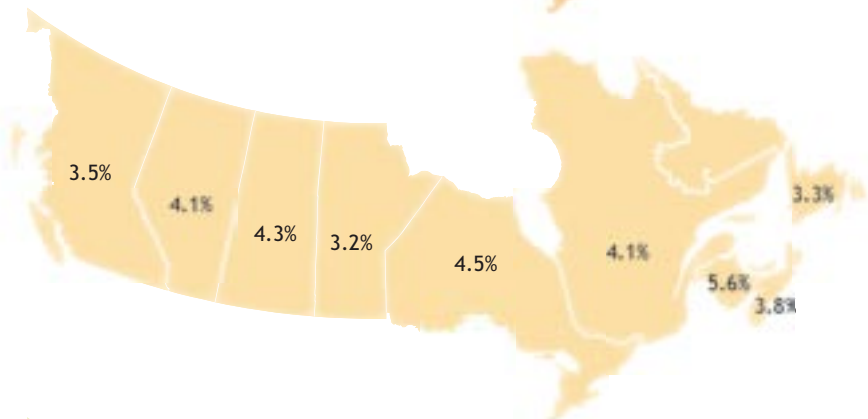
### Overall Growth Rate, 1998-2004



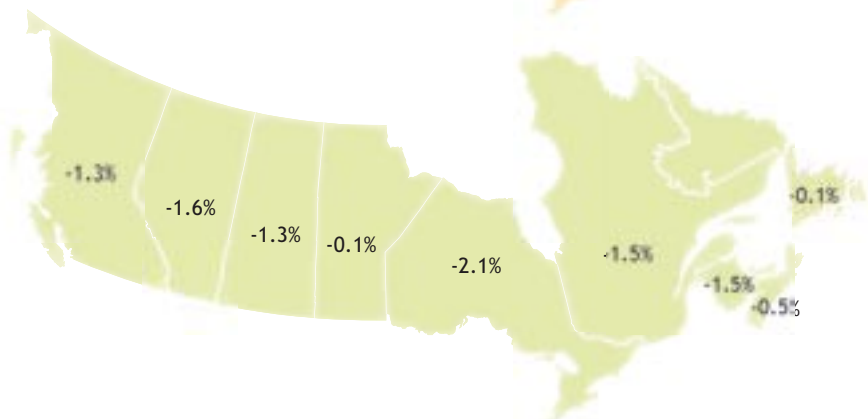
### Volume Effects



### Therapeutic Choices



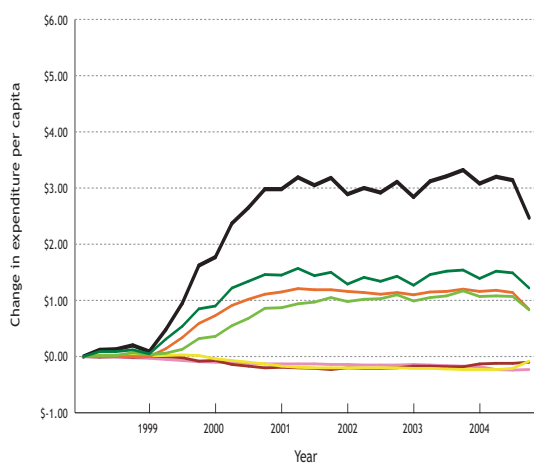
### Price Effects



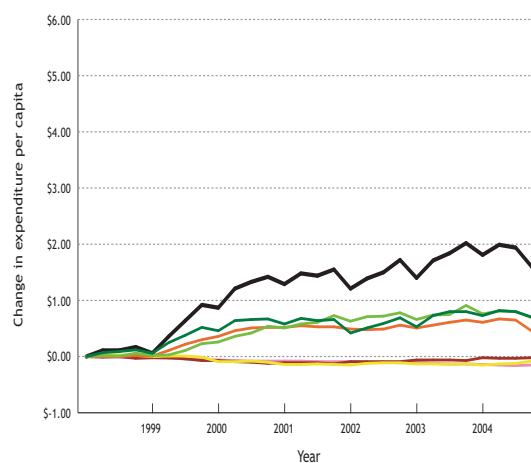
# Antiarthritics

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

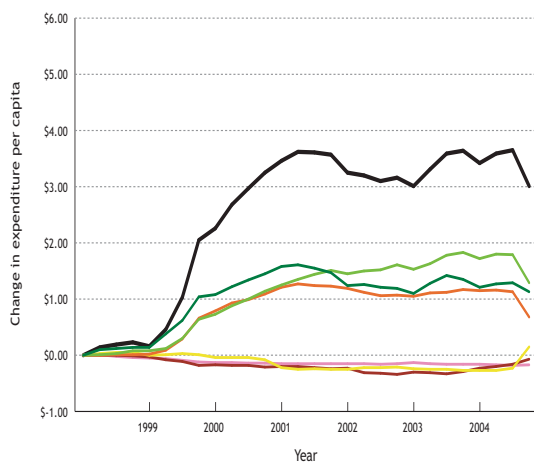
Canada



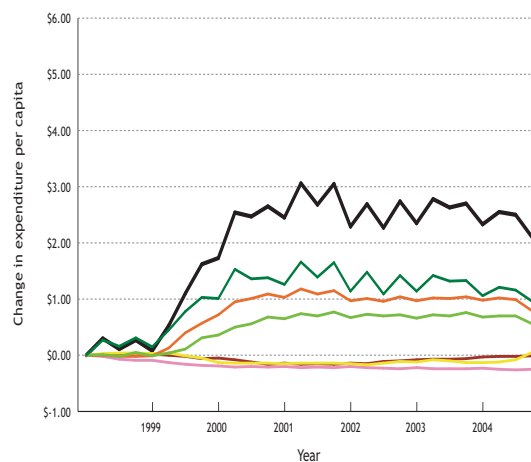
British Columbia



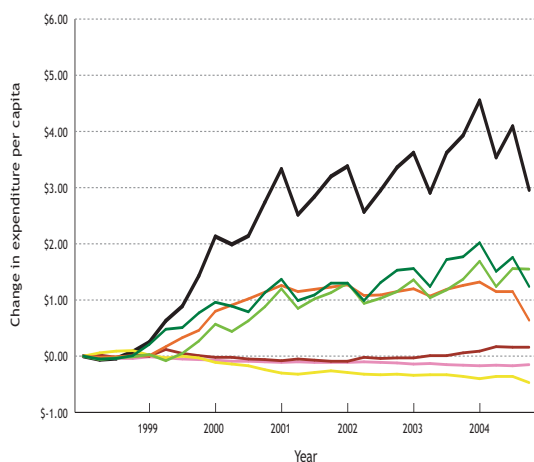
Alberta



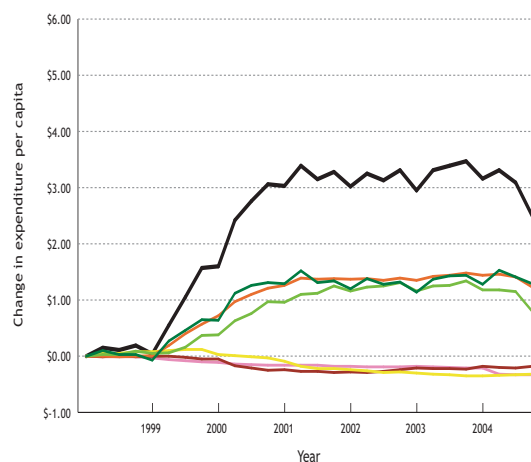
Saskatchewan



Manitoba

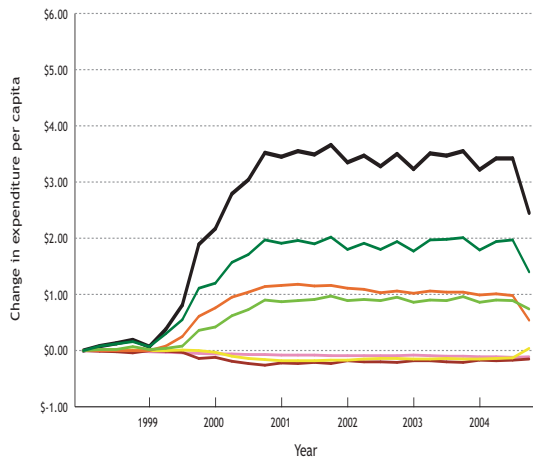


Ontario

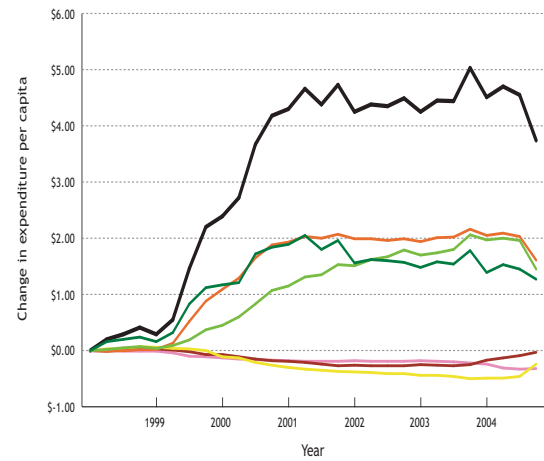


Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

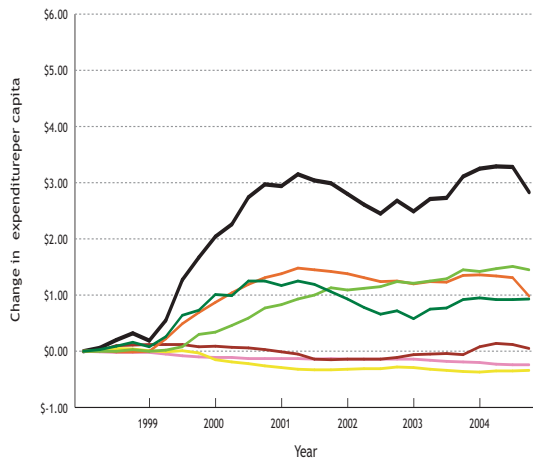
Quebec



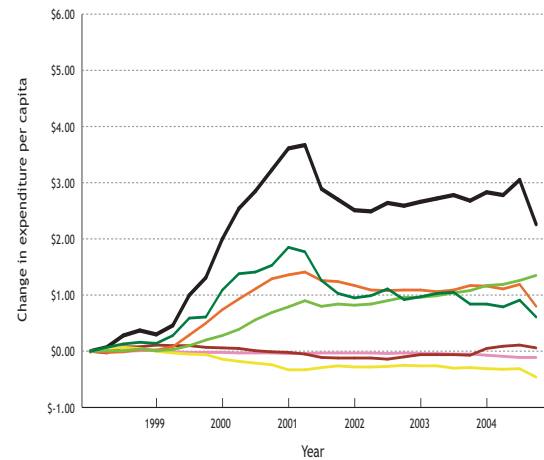
New Brunswick



Nova Scotia

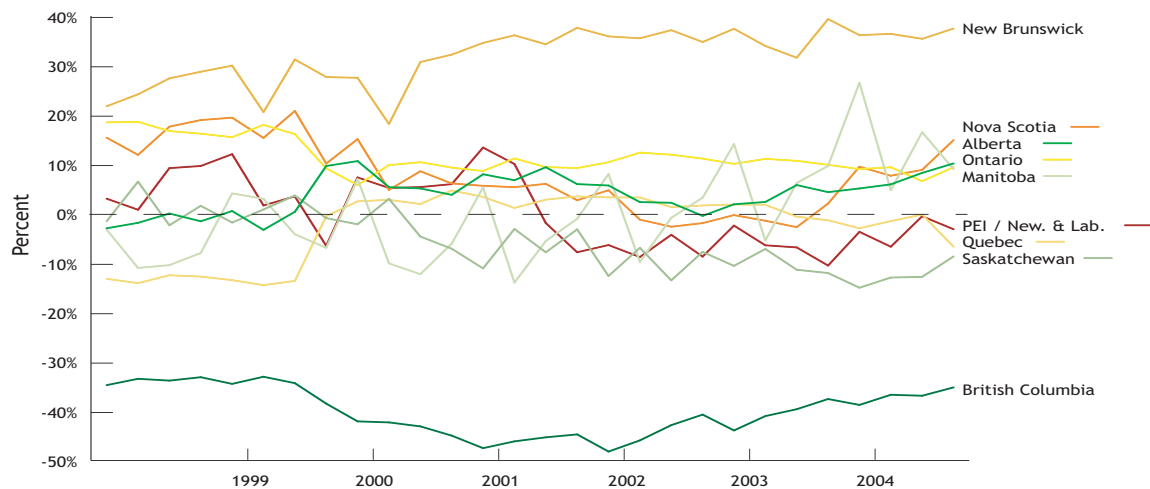


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

### Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, antiarthritic drugs



## Expenditure Levels and Variations

In 2004, Canadians spent approximately \$18 each on oral solid prescription analgesics. Spending in this category is spread relatively evenly across a variety of drug types, including acetaminophen with codeine (22%); synthetic narcotic analgesics such as oxycodone (22%); antimigraine drugs (21%); and morphine (19%).

In 2004, per capita expenditure in the provinces varied by \$13 or 130%, from \$10 in Saskatchewan to \$23 in Alberta. Alberta had consistently higher-than-average expenditure per capita and both Saskatchewan and Quebec had consistently lower-than-average expenditure. This is one of the few therapeutic categories in which an eastern province was consistently below the national average and a western province was consistently above the average.

## Determinants of Variation

All determinants affected variation in per capita expenditure on oral solid prescription analgesics. Volume Effects and Therapeutic Choices were most notable for wide deviations from the national average. However,

Price Effects were also a significant source of variation in this therapeutic category.

Deviations from the national average for Prescription Volume were particularly high for oral solid prescription analgesics. Moreover, provinces with significantly lower-than-average Prescription Volume—notably Saskatchewan and Quebec—also had lower-than-average Prescription Size. As a result, these provinces had rates of use well below the rest of the country.

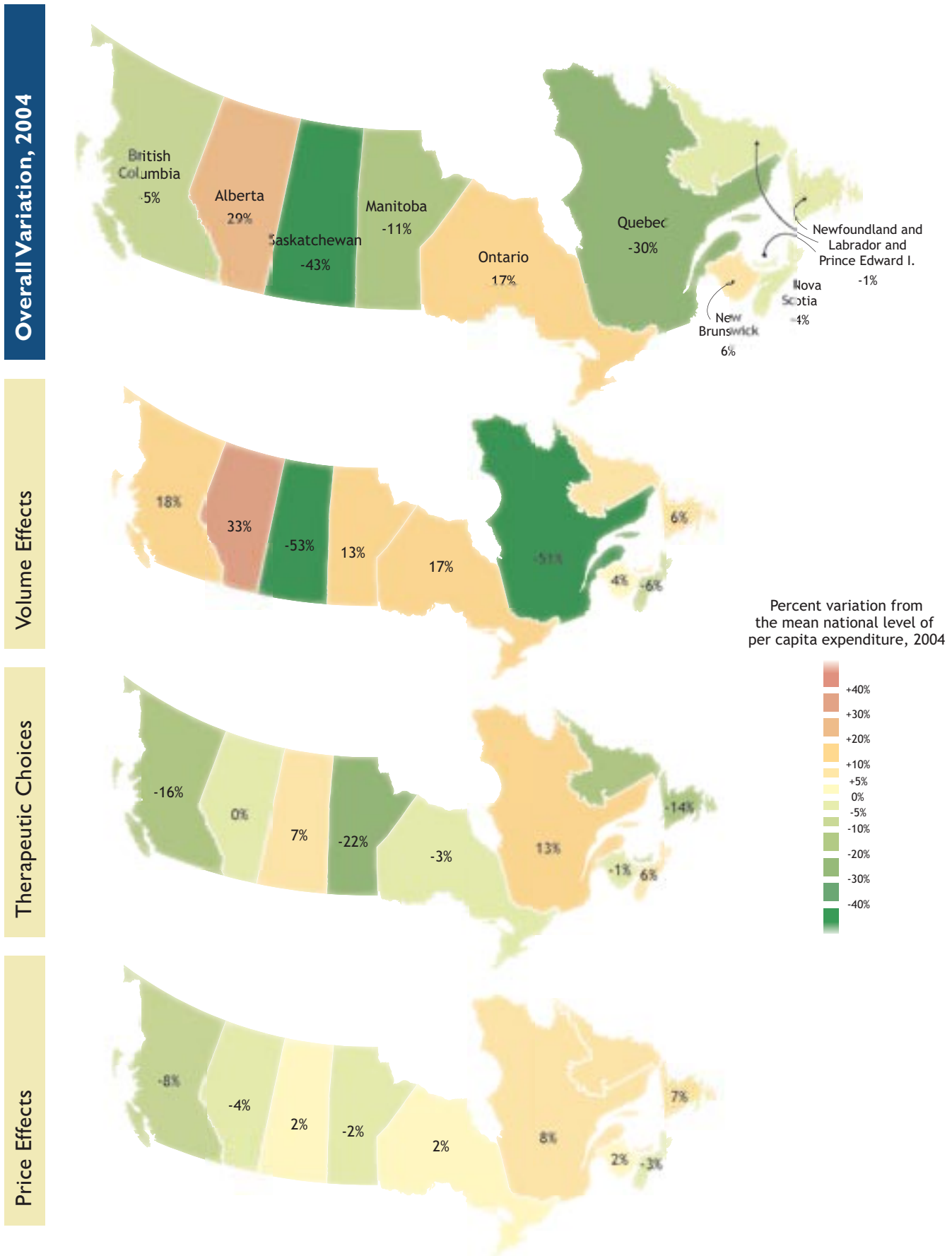
These two provinces also had the highest cost Therapeutic Choices. In particular, residents of Saskatchewan and Quebec tended to receive a higher cost Therapeutic Mix of drug classes from within this therapeutic category. A particularly low-cost Therapeutic Mix was found in Manitoba.

Price Effects also contributed to provincial variation in per capita expenditure on oral solid prescription analgesics. Notably, Quebec had relatively high unit Prices (including dispensing fees) and low rates of Generic Use, whereas British Columbia had relatively low Prices and high Generic Use.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, analgesic drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$17	\$23	\$10	\$16	\$21	\$13	\$19	\$18	\$18
Per capita spending in Canada	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18
<b>Total Difference</b>	<b>-5.1%</b>	<b>28.6%</b>	<b>-43.4%</b>	<b>-10.6%</b>	<b>17.0%</b>	<b>-29.9%</b>	<b>5.5%</b>	<b>-3.8%</b>	<b>-1.3%</b>
Difference due to prescription volume	10.9%	25.9%	-47.4%	6.3%	8.1%	-23.0%	-1.6%	-22.4%	15.3%
Difference due to prescription size	7.4%	7.5%	-5.2%	6.8%	9.1%	-28.0%	6.0%	16.1%	-9.6%
<b>Subtotal Volume Effects</b>	<b>18.3%</b>	<b>33.4%</b>	<b>-52.7%</b>	<b>13.1%</b>	<b>17.2%</b>	<b>-51.1%</b>	<b>4.3%</b>	<b>-6.4%</b>	<b>5.8%</b>
Difference due to therapeutic mix	-10.1%	-9.0%	13.8%	-22.3%	-11.5%	24.1%	3.4%	14.2%	-2.2%
Difference due to drug mix	-5.4%	8.6%	-6.6%	0.2%	9.0%	-10.7%	-4.7%	-8.6%	-11.3%
<b>Subtotal Therapeutic Choices</b>	<b>-15.5%</b>	<b>-0.4%</b>	<b>7.2%</b>	<b>-22.1%</b>	<b>-2.5%</b>	<b>13.4%</b>	<b>-1.3%</b>	<b>5.7%</b>	<b>-13.5%</b>
Difference due to prices	-4.0%	-2.6%	1.0%	-1.3%	1.0%	4.1%	2.6%	-3.0%	1.8%
Difference due to generic use	-3.9%	-1.8%	1.2%	-0.3%	1.3%	3.7%	-0.2%	-0.1%	4.6%
<b>Subtotal Price Effects</b>	<b>-7.9%</b>	<b>-4.4%</b>	<b>2.2%</b>	<b>-1.6%</b>	<b>2.3%</b>	<b>7.8%</b>	<b>2.4%</b>	<b>-3.1%</b>	<b>6.5%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).



## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on analgesics doubled from \$9 in 1998 to \$18 in 2004. Expenditure grew at a rate of almost 12% per year.

Rates of growth in expenditure on oral solid analgesics varied considerably across Canada. Annual rates of growth in per capita expenditure ranged from 7.7% in Nova Scotia to 19.5% in Manitoba. At prevailing rates, per capita expenditure would take less than four years to double in Manitoba and almost ten years to double in Nova Scotia.

## Determinants of Change

Despite variation in the pace of expenditure growth across provinces, the determinants of change were relatively consistent. Nationally, and for all provinces except Saskatchewan and Manitoba, Therapeutic Choices had a greater impact on expenditure inflation than did Volume Effects.

Volume Effects had a notable impact on overall expenditure. Each year between 1998 and 2004, Volume Effects increased per capita expenditures by just over 2% in Nova Scotia and Ontario to over 9% in Manitoba. The remaining provinces experienced approxi-

mately 4% to 5% annual growth in per capita analgesic drug expenditure due to Volume Effects.

Changes in the Therapeutic Mix of drug classes selected from within the analgesic therapeutic category increased per capita expenditure in the non-Atlantic provinces by roughly 4% per year. This reflects increased use of narcotic oral analgesics versus non-narcotic oral analgesics. Changes in the Drug Mix within drug classes contributed between 1% to 4% to annual expenditure inflation in the non-Atlantic provinces. In the Atlantic provinces, Drug Mix contributed approximately 4% to 5% to annual drug expenditure growth, whereas Therapeutic Mix contributed 2.6% or less.

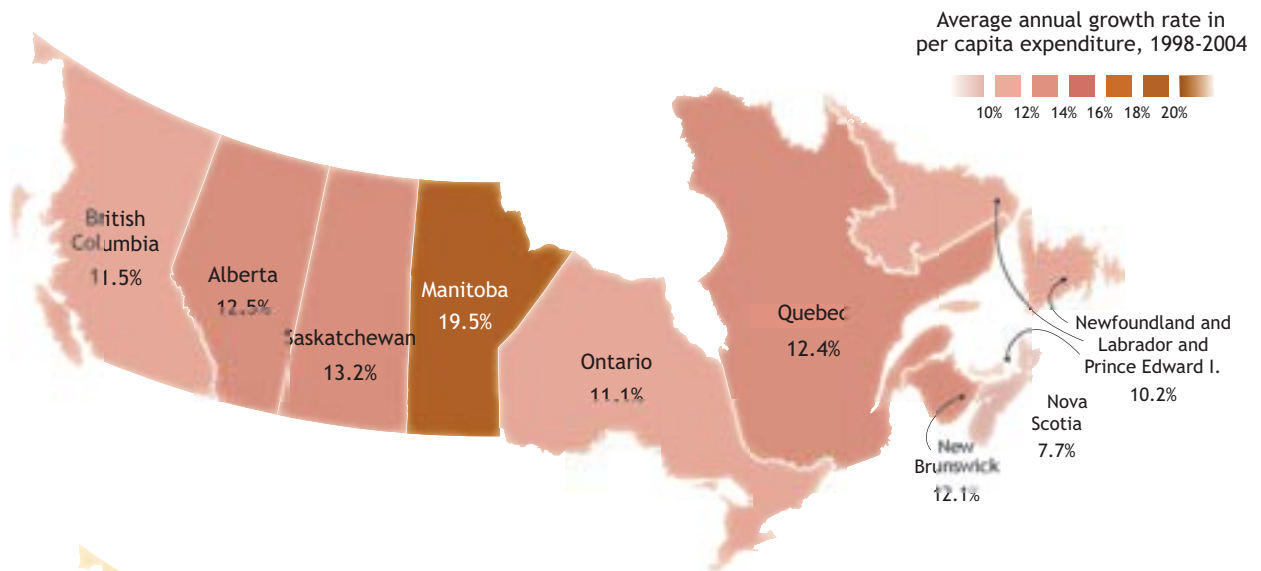
With the exception of rapid price increases in Manitoba, Price Effects contributed relatively little to trends in per capita expenditure on oral solid analgesics.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, analgesic drugs

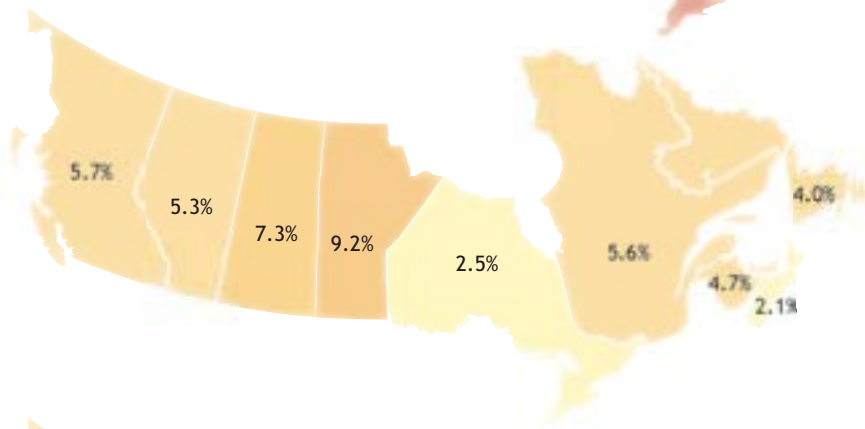
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$9	\$9	\$12	\$5	\$6	\$11	\$6	\$10	\$11	\$10
Per capita spending in 2004	\$18	\$17	\$23	\$10	\$16	\$21	\$13	\$19	\$18	\$18
<b>Average Annual Growth (AAG)</b>	<b>11.8%</b>	<b>11.5%</b>	<b>12.5%</b>	<b>13.2%</b>	<b>19.5%</b>	<b>11.1%</b>	<b>12.4%</b>	<b>12.1%</b>	<b>7.7%</b>	<b>10.2%</b>
AAG due to prescription volume	2.4%	3.5%	2.5%	5.8%	6.4%	1.0%	3.9%	3.1%	-1.2%	1.5%
AAG due to prescription size	1.8%	2.3%	2.8%	1.5%	2.7%	1.5%	1.7%	1.6%	3.3%	2.5%
<b>Subtotal Volume Effects</b>	<b>4.2%</b>	<b>5.7%</b>	<b>5.3%</b>	<b>7.3%</b>	<b>9.2%</b>	<b>2.5%</b>	<b>5.6%</b>	<b>4.7%</b>	<b>2.1%</b>	<b>4.0%</b>
AAG due to therapeutic mix	3.9%	3.9%	3.7%	3.9%	4.3%	3.4%	4.8%	2.6%	2.3%	1.2%
AAG due to drug mix	3.0%	1.8%	3.6%	2.8%	2.3%	4.1%	1.1%	4.5%	5.3%	5.0%
<b>Subtotal Therapeutic Choices</b>	<b>6.9%</b>	<b>5.7%</b>	<b>7.4%</b>	<b>6.8%</b>	<b>6.5%</b>	<b>7.5%</b>	<b>5.9%</b>	<b>7.0%</b>	<b>7.6%</b>	<b>6.3%</b>
AAG due to prices	1.3%	0.8%	0.3%	-0.1%	4.9%	1.6%	1.5%	1.1%	-0.1%	1.5%
AAG due to generic use	-0.6%	-0.7%	-0.5%	-0.9%	-1.2%	-0.5%	-0.6%	-0.8%	-1.9%	-1.5%
<b>Subtotal Price Effects</b>	<b>0.7%</b>	<b>0.1%</b>	<b>-0.2%</b>	<b>-1.0%</b>	<b>3.7%</b>	<b>1.1%</b>	<b>0.9%</b>	<b>0.3%</b>	<b>-2.0%</b>	<b>0.0%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

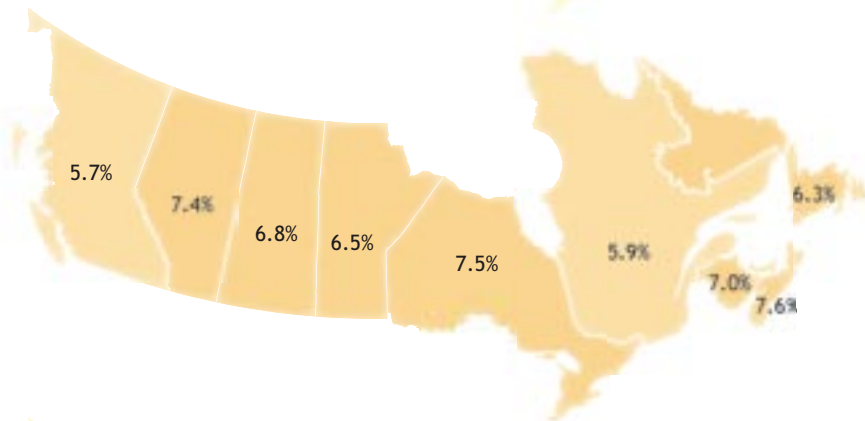
### Overall Growth Rate, 1998-2004



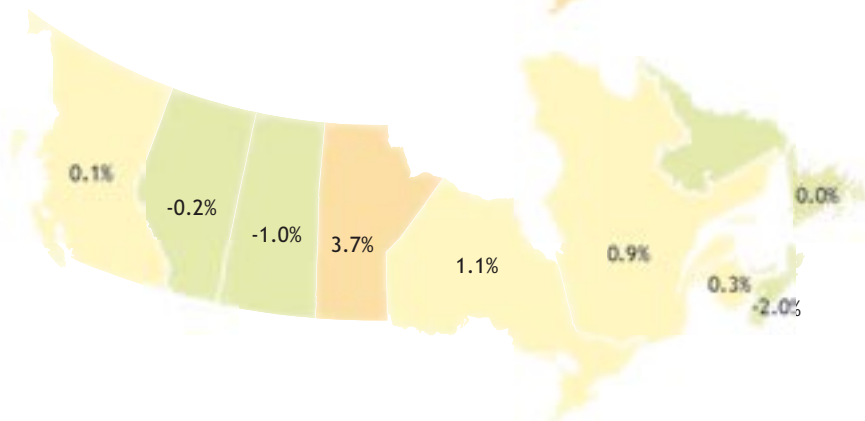
### Volume Effects



### Therapeutic Choices



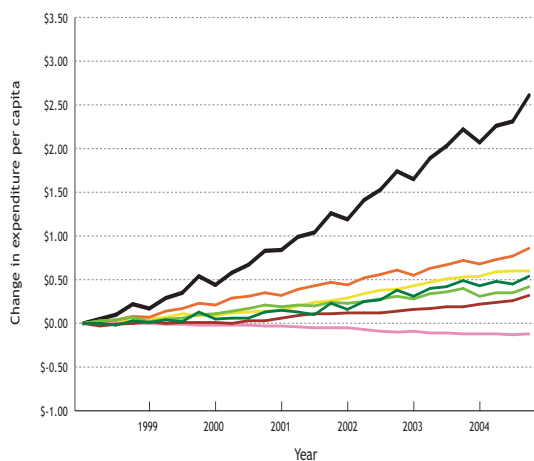
### Price Effects



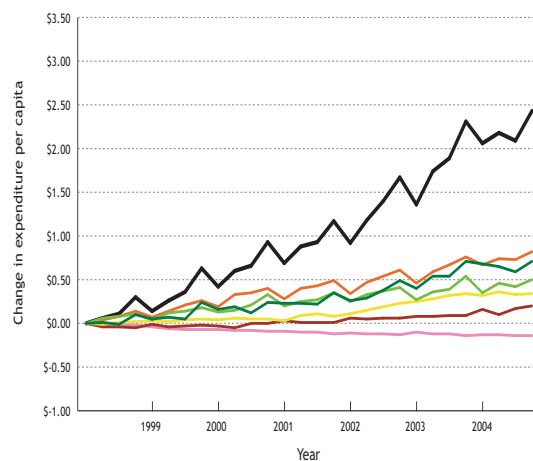
# Analgesics

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

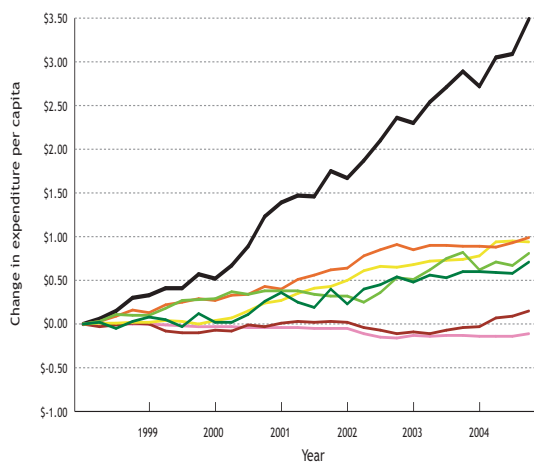
## Canada



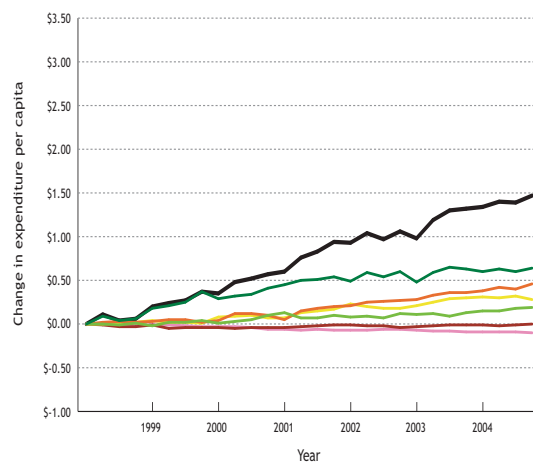
## British Columbia



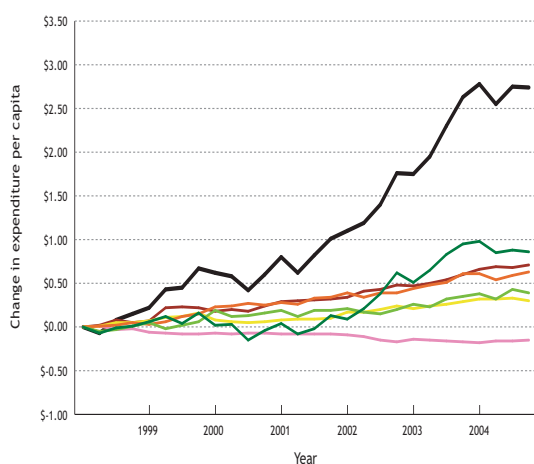
## Alberta



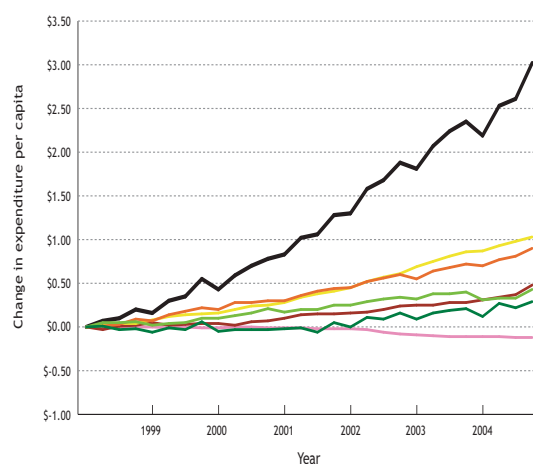
## Saskatchewan



## Manitoba

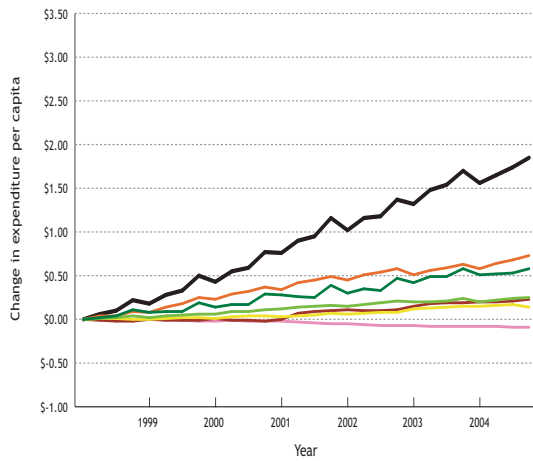


## Ontario

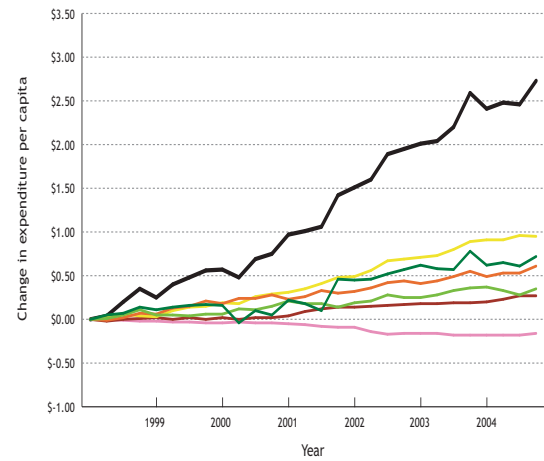


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

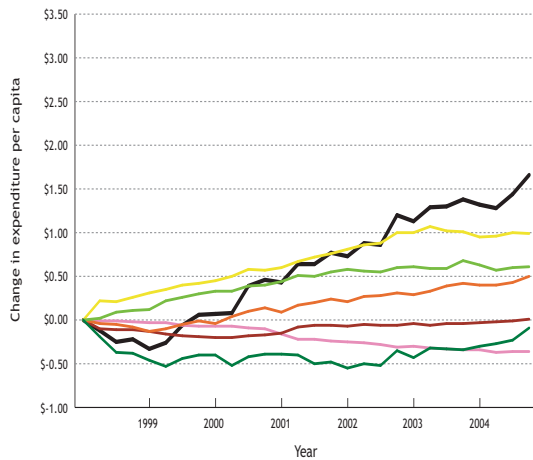
### Quebec



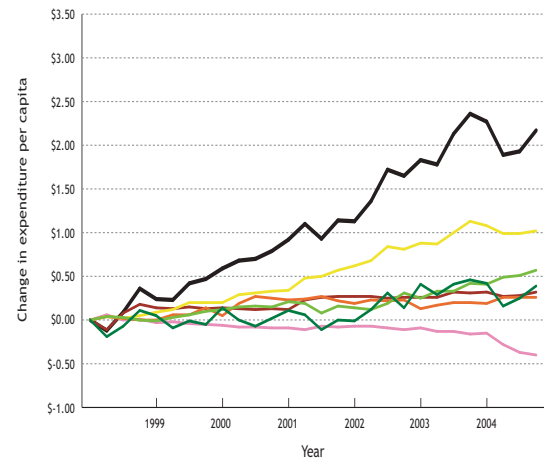
### New Brunswick



### Nova Scotia

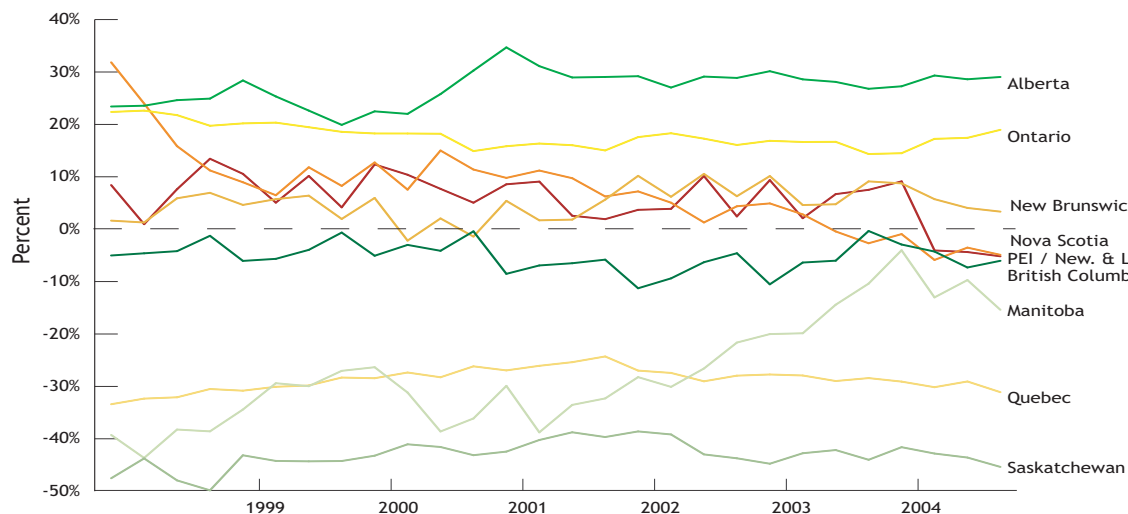


### PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
 Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, analgesic drugs



## Expenditure Levels and Variations

Canadians spent an average of \$18 per capita on neurological drugs in 2004. Most of this expenditure was on drugs to manage seizure disorders (60%); Alzheimer's disease and dementia (24%); and Parkinson's disease (10%).

In 2004, per capita expenditure in the provinces varied by \$7 or 54%, from \$13 in Prince Edward Island and Newfoundland and Labrador to \$20 in Manitoba and Quebec.

Provincial variation in neurological drug expenditure increased over the period from 1998 to 2004, with Saskatchewan and Prince Edward Island and Newfoundland and Labrador trending below the national average.

## Determinants of Variation

All determinants affected provincial variation in per capita expenditure on neurological drugs.

Volume Effects had a significant impact on differences in per capita expenditures across provinces. The individual differences in Prescription Volume and Prescription Size were greater than the combined dif-

ferences in these Volume Effects because provinces tended to either prescribe fewer, longer prescriptions or more, shorter prescriptions. Notwithstanding this, differences in the volume of neurologicals purchased drove per capita expenditures in Manitoba and Quebec significantly above the national average.

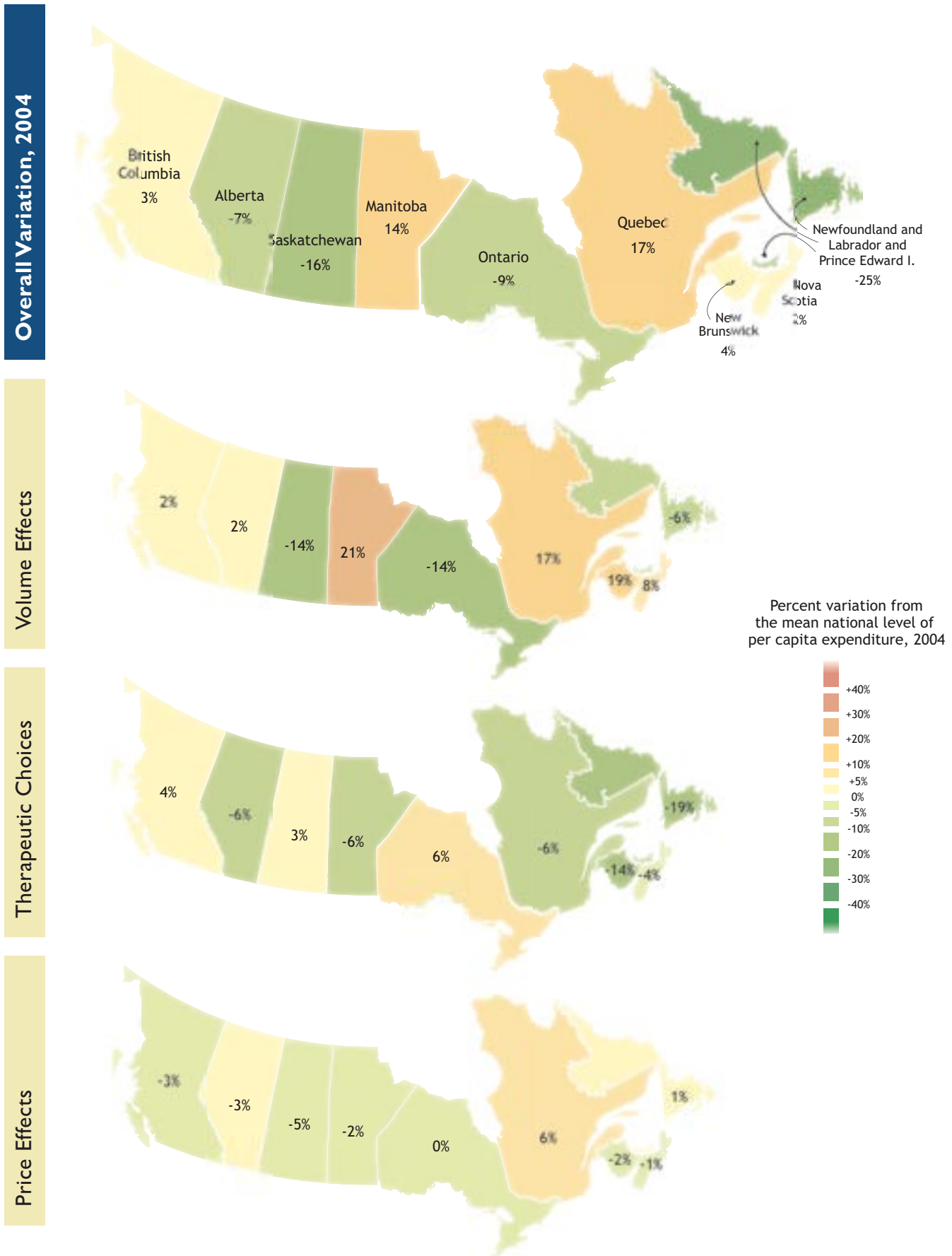
Therapeutic Choices added to variations in per capita expenditure on neurological drugs across provinces. Notably, the mix of both drug classes and specific drugs (Therapeutic Mix and Drug Mix) was less costly in Prince Edward Island and Newfoundland and Labrador than in the rest of Canada. In contrast to all other provinces, in Ontario, the Therapeutic Mix of neurological drug classes used was more costly than the national average.

Price Effects caused some variation in per capita expenditure on neurological drugs. Quebec had relatively high unit Prices (including dispensing fees) and low rates of Generic Use.

### Percent difference between provincial averages and the national average of drug expenditure, 2004, neurological drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$18	\$16	\$15	\$20	\$16	\$20	\$18	\$18	\$13
Per capita spending in Canada	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18
<b>Total Difference</b>	<b>3.4%</b>	<b>-7.1%</b>	<b>-15.7%</b>	<b>13.6%</b>	<b>-8.7%</b>	<b>16.8%</b>	<b>3.9%</b>	<b>2.1%</b>	<b>-24.6%</b>
Difference due to prescription volume	-7.9%	-23.1%	-32.0%	1.3%	-30.9%	57.3%	-16.3%	-35.6%	-27.9%
Difference due to prescription size	10.2%	24.7%	17.8%	19.6%	17.1%	-40.1%	35.7%	43.3%	21.7%
<b>Subtotal Volume Effects</b>	<b>2.3%</b>	<b>1.6%</b>	<b>-14.2%</b>	<b>21.0%</b>	<b>-13.8%</b>	<b>17.1%</b>	<b>19.4%</b>	<b>7.7%</b>	<b>-6.2%</b>
Difference due to therapeutic mix	-4.6%	-10.0%	-2.9%	-6.6%	9.4%	-4.2%	-5.7%	-1.2%	-6.8%
Difference due to drug mix	8.5%	4.4%	6.2%	0.8%	-3.9%	-1.6%	-7.9%	-3.2%	-12.3%
<b>Subtotal Therapeutic Choices</b>	<b>4.0%</b>	<b>-5.5%</b>	<b>3.3%</b>	<b>-5.8%</b>	<b>5.5%</b>	<b>-5.8%</b>	<b>-13.6%</b>	<b>-4.3%</b>	<b>-19.1%</b>
Difference due to prices	-1.8%	-1.8%	0.1%	0.5%	0.5%	1.9%	-0.3%	0.0%	1.7%
Difference due to generic use	-1.1%	-1.3%	-4.9%	-2.0%	-0.9%	3.7%	-1.6%	-1.1%	-1.0%
<b>Subtotal Price Effects</b>	<b>-2.9%</b>	<b>-3.1%</b>	<b>-4.8%</b>	<b>-1.5%</b>	<b>-0.4%</b>	<b>5.5%</b>	<b>-1.9%</b>	<b>-1.2%</b>	<b>0.7%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).



## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on neurological drugs more than doubled from \$8 in 1998 to \$18 in 2004. Expenditure grew at a rate of 15% per year, making neurologicals the third fastest growing therapeutic category of medicines in this analysis.

Per capita spending increased most rapidly in Manitoba, Quebec, and Alberta; it grew least rapidly in Prince Edward Island and Newfoundland and Labrador and Saskatchewan.

## Determinants of Change

Nationally, and for all provinces except for British Columbia, Alberta and Manitoba, Therapeutic Choices had a more significant impact on expenditure inflation than Volume Effects.

Despite the role of Therapeutic Choices on expenditure trends, Prescription Volume was an important expenditure-driver in this therapeutic category. Prescription Volume increased in all provinces. This was partially offset in some provinces by a reduction in Prescription Size. Combined, these Volume

Effects increased per capita expenditure on neurological drugs at annual rates ranging from 5.1% in Ontario to 11.7% in Manitoba.

Therapeutic Choices contributed almost 10% per year to national expenditure inflation within this drug category. Changes in the Therapeutic Mix of drug classes selected from within the neurological category had a modest impact on expenditure growth (1.1% to 5.5% per year across provinces). Changes in the Drug Mix within specific classes of neurological drug had a more significant impact on expenditure growth (3.9% to 7.6% per year across provinces). Most of this impact stemmed from the mix of drugs selected, specifically, the increased use of clonazepam.

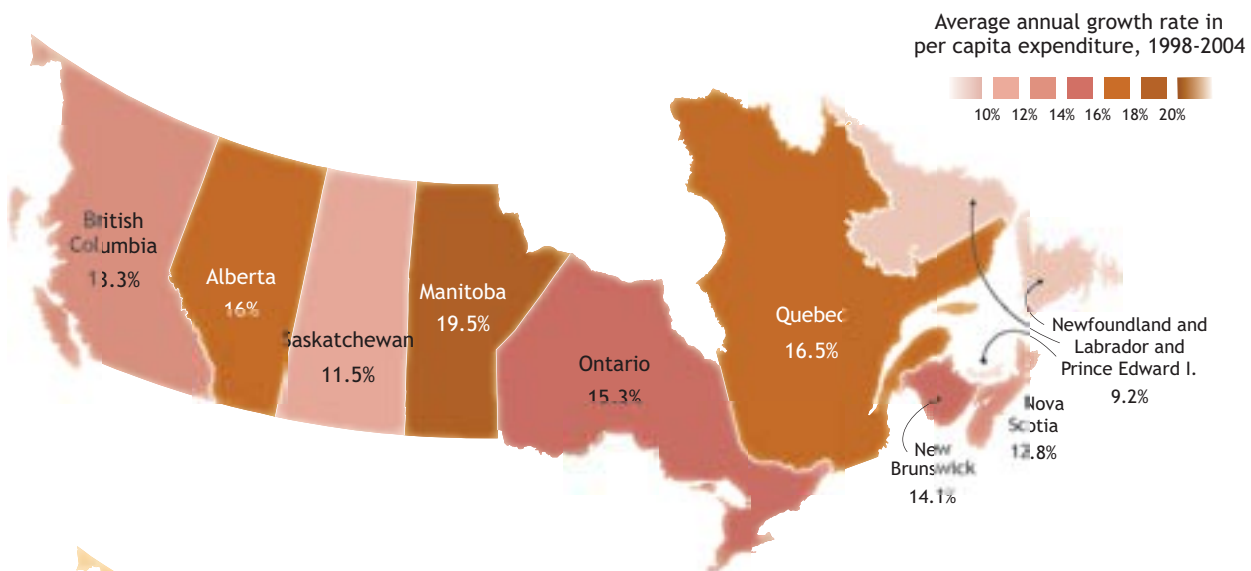
Owing largely to Generic Use, Price Effects caused a decline in per capita expenditure on neurological drugs in all provinces.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, neurological drugs

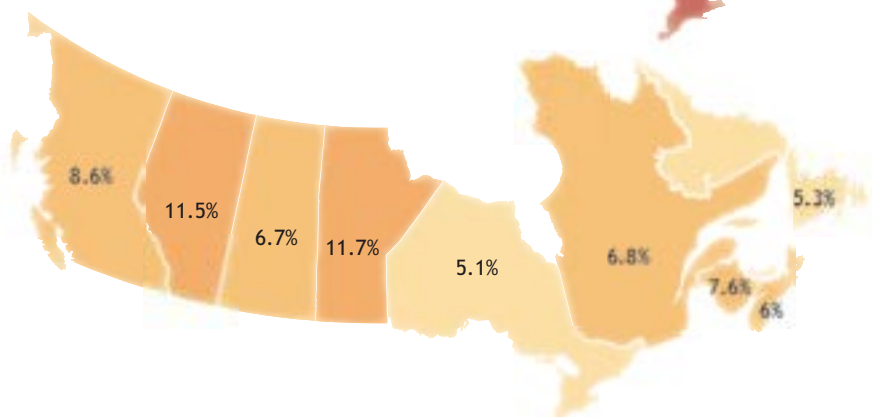
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$8	\$9	\$7	\$8	\$7	\$7	\$8	\$8	\$9	\$8
Per capita spending in 2004	\$18	\$18	\$16	\$15	\$20	\$16	\$20	\$18	\$18	\$13
Average Annual Growth (AAG)	15.2%	13.3%	16.0%	11.5%	19.5%	15.3%	16.5%	14.1%	12.8%	9.2%
AAG due to prescription volume	9.6%	10.1%	8.8%	6.8%	11.0%	8.6%	11.6%	5.9%	3.9%	2.3%
AAG due to prescription size	-3.0%	-1.4%	2.7%	-0.1%	0.7%	-3.5%	-4.8%	1.8%	2.1%	3.0%
Subtotal Volume Effects	6.6%	8.6%	11.5%	6.7%	11.7%	5.1%	6.8%	7.6%	6.0%	5.3%
AAG due to therapeutic mix	3.5%	1.1%	1.4%	1.6%	1.3%	5.5%	3.5%	2.4%	2.8%	2.1%
AAG due to drug mix	6.3%	5.8%	5.7%	5.8%	7.1%	5.7%	7.6%	6.1%	5.7%	3.9%
Subtotal Therapeutic Choices	9.7%	6.9%	7.1%	7.4%	8.3%	11.2%	11.0%	8.5%	8.5%	6.0%
AAG due to prices	0.5%	0.1%	-0.3%	-0.3%	1.1%	0.6%	0.4%	0.2%	0.2%	-0.4%
AAG due to generic use	-1.7%	-2.2%	-2.4%	-2.4%	-1.7%	-1.6%	-1.7%	-2.2%	-1.9%	-1.6%
Subtotal Price Effects	-1.1%	-2.2%	-2.7%	-2.6%	-0.6%	-1.0%	-1.2%	-2.0%	-1.7%	-2.0%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

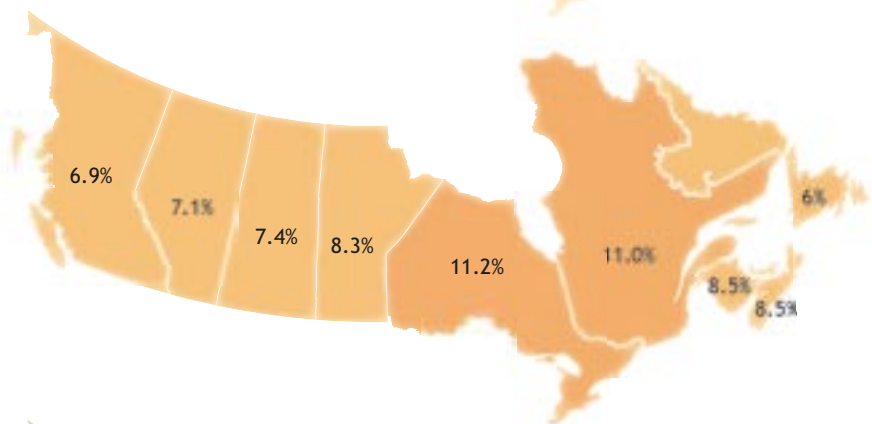
### Overall Growth Rate, 1998-2004



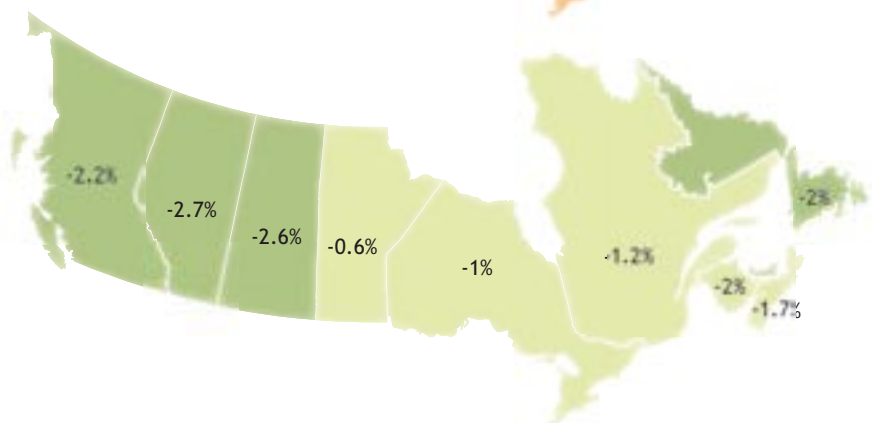
### Volume Effects



### Therapeutic Choices



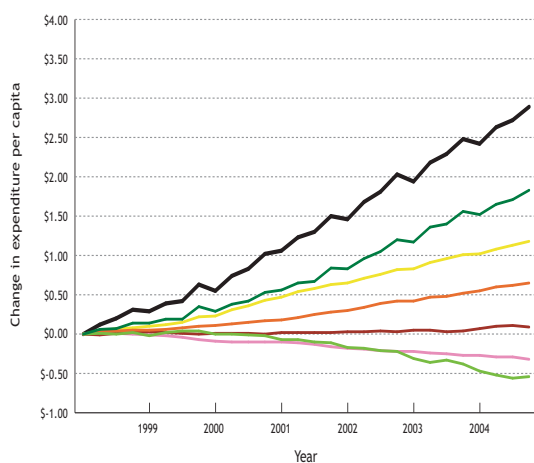
### Price Effects



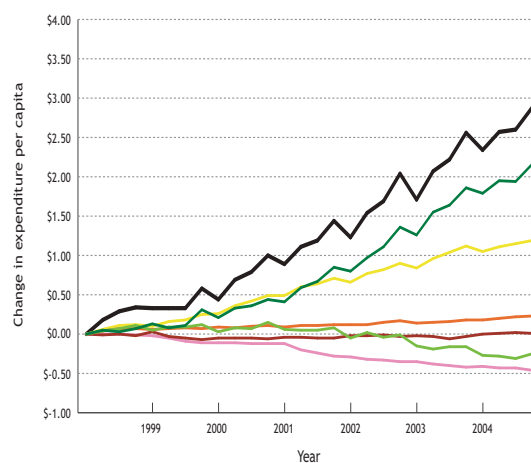
# Neurologicals

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

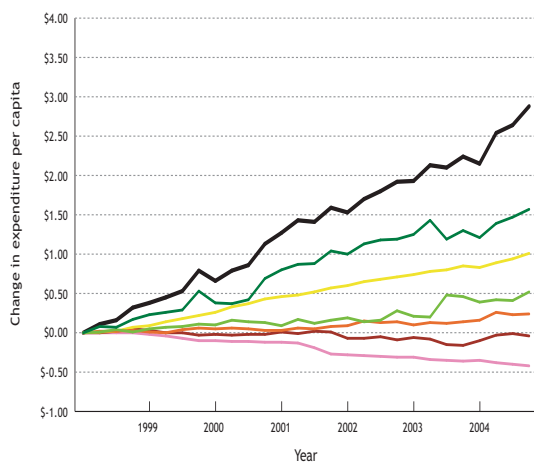
## Canada



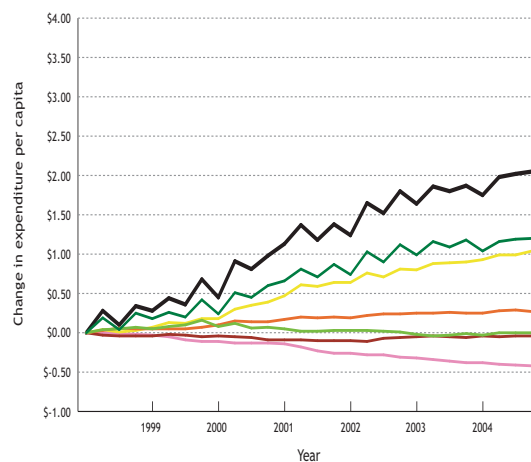
## British Columbia



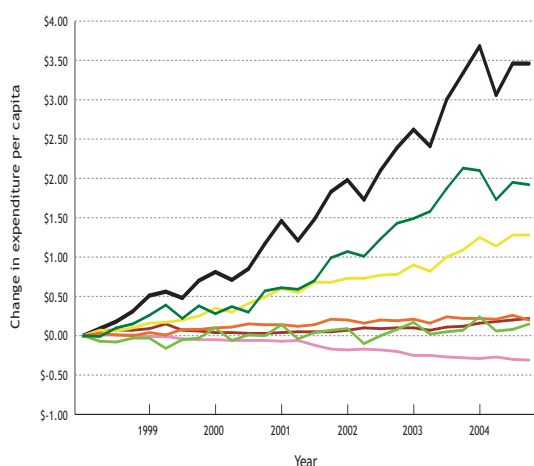
## Alberta



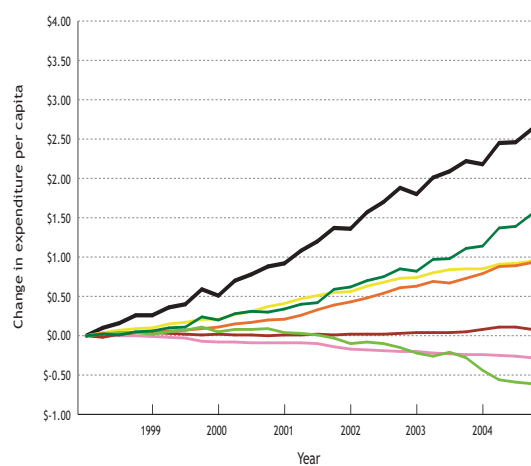
## Saskatchewan



## Manitoba

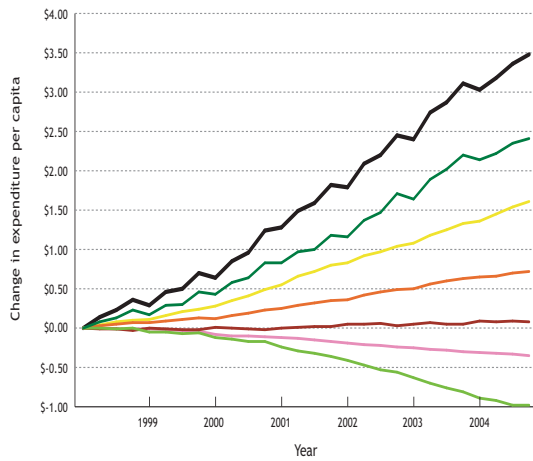


## Ontario

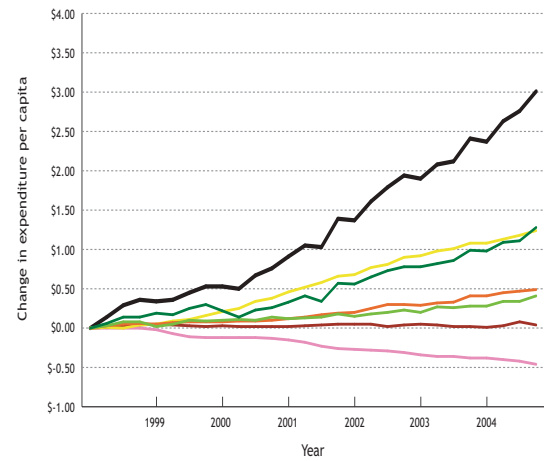


Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

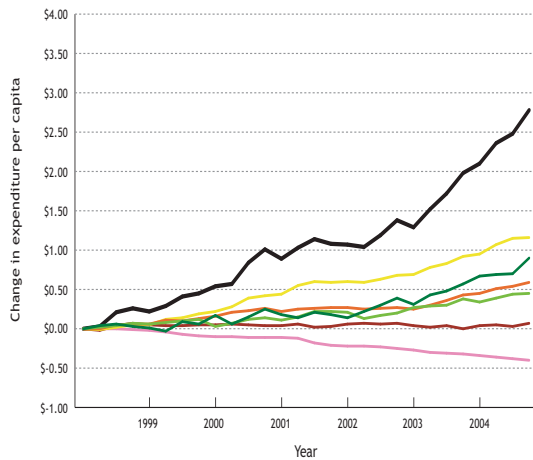
### Quebec



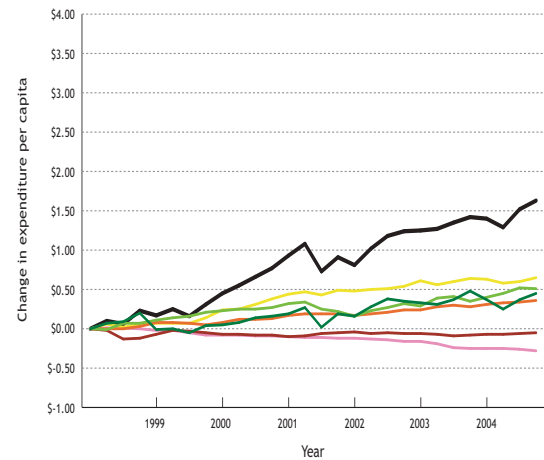
### New Brunswick



### Nova Scotia

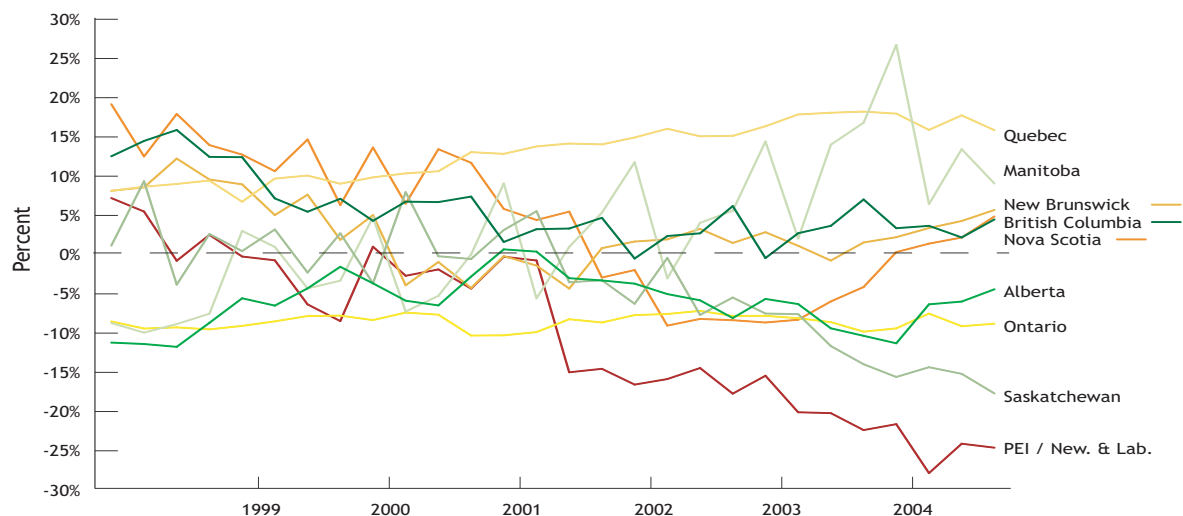


### PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix — Total change —  
Therapeutic mix — Generic use — Price changes —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, neurological drugs



# Hormones and Related Therapy

Level of Per Capita Expenditure, 2004

## Expenditure Levels and Variations

Canadians spent \$17 per capita on oral solid hormones and related therapies in 2004. Two-thirds of the spending in this category was on drugs to treat osteoporosis (67%). Most of the remaining expenditure was on hormone replacement therapy. (Oral contraceptives are not included in this category.)

In 2004, per capita expenditure in the provinces varied by \$12 or 120%, from \$10 in Prince Edward Island and Newfoundland and Labrador to \$22 in Quebec. Expenditure per capita in Quebec was consistently above national average from 1998 to 2004.

## Determinants of Variation

Provincial variations in per capita expenditure on oral solid prescription hormones were driven primarily by Volume Effects.

For example, residents of Quebec received far more (though shorter) prescriptions from this therapeutic category than residents in other provinces. In contrast, residents of Saskatchewan filled far fewer (and shorter) prescriptions than did residents in other provinces.

Therapeutic Choices also played an important role in determining relative expenditure per capita across provinces. In comparison to Ontario, Alberta, and Saskatchewan, the Therapeutic Mix of drug classes from which patients were prescribed treatment was less costly in other provinces. This reflects the fact that a higher-than-average share of oral solid hormone prescriptions in Ontario and Alberta are for osteoporosis (bone density drugs) rather than other drugs in this class (hormone replacement therapy).

Variation in prices of oral solid prescription hormones varied significantly, with the Prices of drugs (including dispensing fees) much higher in Saskatchewan and Ontario than in the rest of Canada.

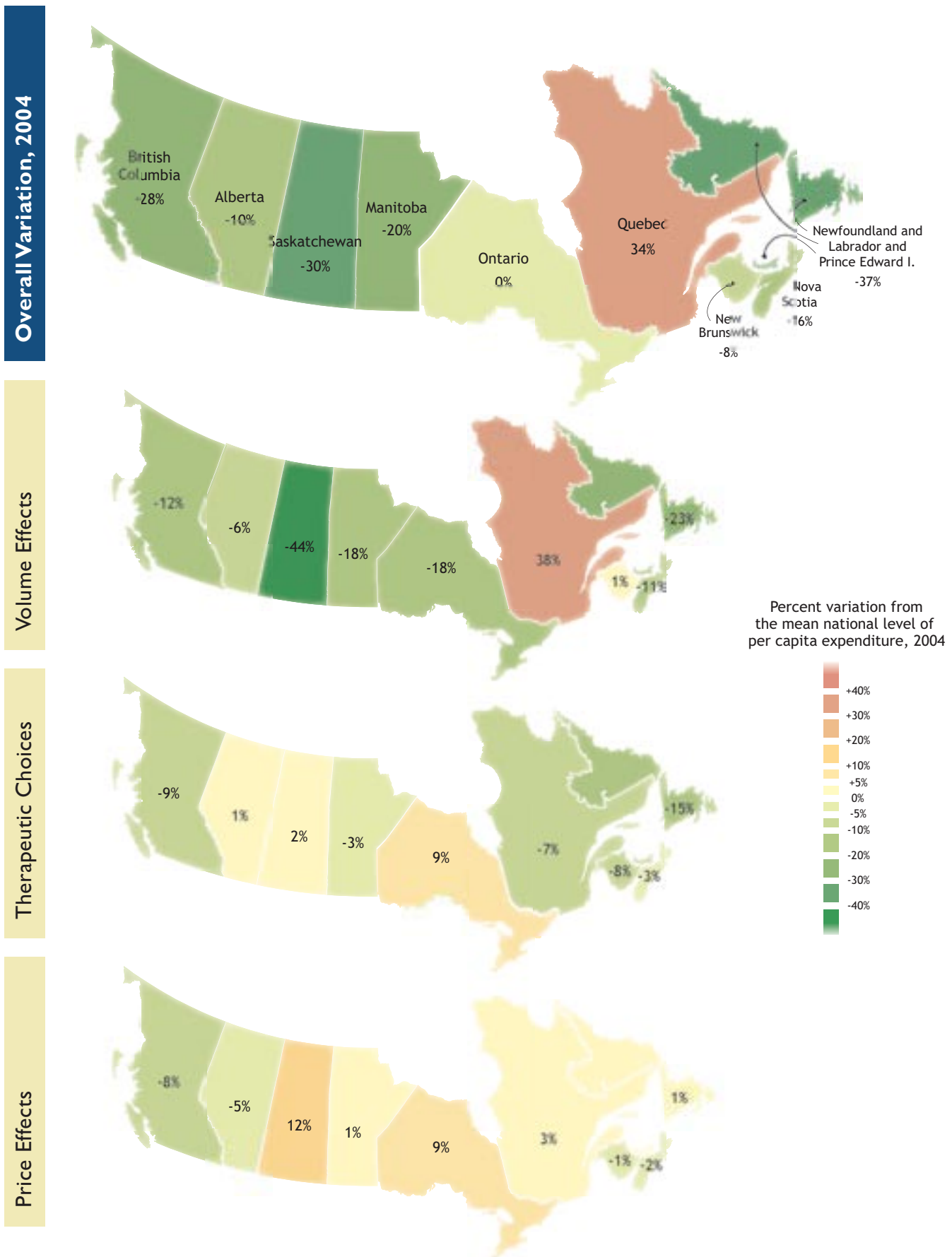
### Percent difference between provincial averages and the national average of drug expenditure, 2004, hormones

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$12	\$15	\$12	\$13	\$17	\$22	\$15	\$14	\$10
Per capita spending in Canada	\$17	\$17	\$17	\$17	\$17	\$17	\$17	\$17	\$17
<b>Total Difference</b>	<b>-28.0%</b>	<b>-10.4%</b>	<b>-30.3%</b>	<b>-20.4%</b>	<b>-0.4%</b>	<b>33.8%</b>	<b>-8.2%</b>	<b>-15.5%</b>	<b>-37.4%</b>
Difference due to prescription volume	-39.5%	-37.0%	-25.8%	-24.6%	-36.4%	81.2%	-26.3%	-38.7%	-33.9%
Difference due to prescription size	27.8%	30.8%	-18.0%	6.1%	18.2%	-42.8%	26.9%	27.4%	10.6%
<b>Subtotal Volume Effects</b>	<b>-11.7%</b>	<b>-6.2%</b>	<b>-43.8%</b>	<b>-18.4%</b>	<b>-18.2%</b>	<b>38.4%</b>	<b>0.5%</b>	<b>-11.2%</b>	<b>-23.3%</b>
Difference due to therapeutic mix	-2.6%	3.3%	3.0%	-6.4%	12.2%	-8.2%	-11.0%	-4.7%	-12.1%
Difference due to drug mix	-6.0%	-2.8%	-1.0%	3.9%	-3.0%	1.0%	2.8%	1.9%	-2.7%
<b>Subtotal Therapeutic Choices</b>	<b>-8.6%</b>	<b>0.5%</b>	<b>2.0%</b>	<b>-2.5%</b>	<b>9.2%</b>	<b>-7.2%</b>	<b>-8.1%</b>	<b>-2.8%</b>	<b>-14.8%</b>
Difference due to prices	-7.2%	-4.5%	11.8%	0.8%	9.2%	1.4%	-0.5%	-1.4%	0.5%
Difference due to generic use	-0.5%	-0.1%	-0.3%	-0.4%	-0.6%	1.1%	-0.2%	-0.1%	0.2%
<b>Subtotal Price Effects</b>	<b>-7.7%</b>	<b>-4.6%</b>	<b>11.5%</b>	<b>0.5%</b>	<b>8.5%</b>	<b>2.6%</b>	<b>-0.6%</b>	<b>-1.5%</b>	<b>0.7%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

# Hormones and Related Therapy

Determinants of Variation in Per Capita Expenditure, 2004



# Hormones and Related Therapy

Change in Per Capita Expenditure, 1998-2004

## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on hormones and related therapies increased by almost 90% from \$9 in 1998 to \$17 in 2004. Expenditure grew at close to 12% per year.

The annual rate of growth in hormone expenditure per capita between 1998 and 2004 varied considerably across provinces. Expenditure per capita grew most rapidly in Manitoba (17.6% per year), followed by Quebec (12.6%). Expenditure growth was slowest in Saskatchewan (6.8%).

## Determinants of Change

Volume Effects had a modest impact on expenditure in all provinces. This expenditure-determinant had an inflationary impact on per capita expenditure from 1998 to 2002, after which Prescription Volume declined.

The average size of prescriptions dispensed increased in all provinces except British Columbia. The rate at which prescription size increased is particularly notable in Saskatchewan—the change resulting from a sudden, one-time shift in prescription size in 2002.

Nationally and for all provinces, Therapeutic Choices among oral solid hormone drugs were the largest determinant of drug expenditure inflation over the period. Changes in the Therapeutic Mix of drug classes selected was the primary cause of cost increase stemming from Therapeutic Choices. This trend captures the increased utilization of bone metabolism drugs for the treatment of osteoporosis.

Price Effects had a modest to significant impact on provincial expenditure from 1998 to 2004. Savings stemming from the use of generic hormone drugs were moderate, ranging from -0.1% to -0.5% per year across provinces. However, falling prices (including dispensing fees) generated substantial annual savings in Saskatchewan, Quebec, and Ontario. All three of these provinces experienced a significant increase in Prescription Size during the study period, which has the effect of reducing unit prices that include dispensing fees.

## Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, hormones

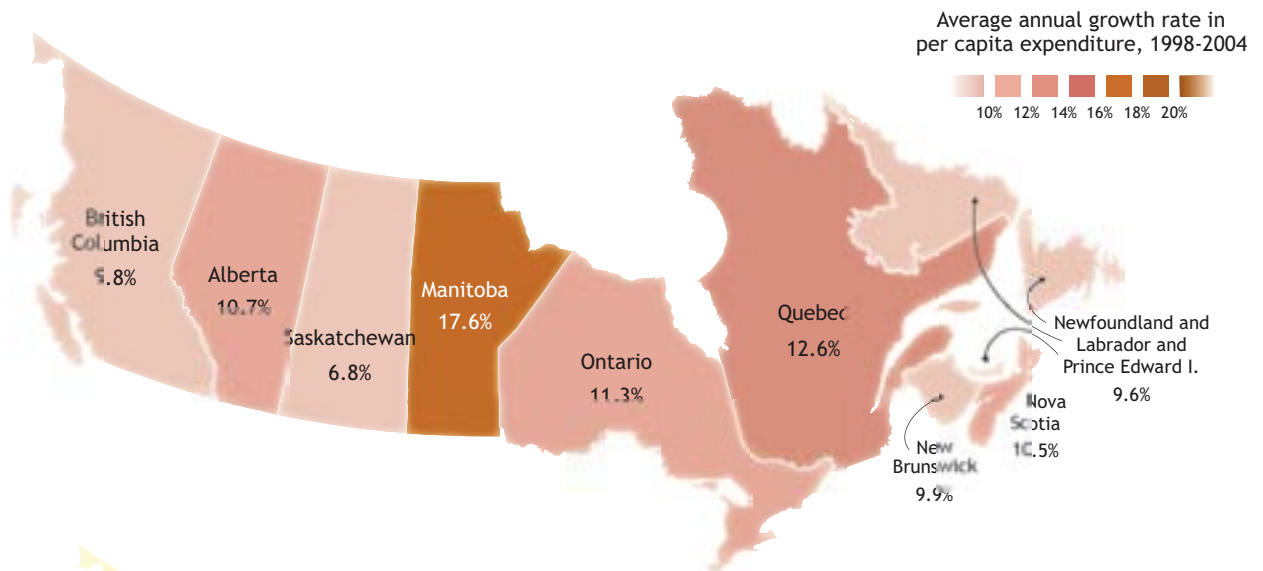
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$9	\$7	\$8	\$8	\$5	\$9	\$11	\$9	\$8	\$6
Per capita spending in 2004	\$17	\$12	\$15	\$12	\$13	\$17	\$22	\$15	\$14	\$10
Average Annual Growth (AAG)	11.5%	9.8%	10.7%	6.8%	17.6%	11.3%	12.6%	9.9%	10.5%	9.6%
AAG due to prescription volume	1.5%	1.3%	0.0%	-0.2%	4.9%	0.5%	2.9%	-1.9%	-1.8%	-3.4%
AAG due to prescription size	0.8%	-0.8%	4.6%	14.4%	1.5%	8.2%	7.0%	2.5%	2.2%	2.4%
Subtotal Volume Effects	2.3%	0.5%	4.6%	14.2%	6.4%	8.7%	9.8%	0.6%	0.4%	-1.0%
AAG due to therapeutic mix	9.4%	6.1%	6.6%	5.8%	8.8%	9.1%	10.3%	8.4%	8.6%	8.2%
AAG due to drug mix	1.0%	1.9%	0.8%	0.1%	0.0%	1.5%	0.5%	0.5%	1.1%	0.8%
Subtotal Therapeutic Choices	10.4%	8.0%	7.4%	5.9%	8.8%	10.5%	10.7%	8.8%	9.6%	9.0%
AAG due to prices	-0.9%	1.8%	-1.0%	-13.0%	2.8%	-7.5%	-7.9%	0.7%	0.7%	2.0%
AAG due to generic use	-0.3%	-0.5%	-0.3%	-0.2%	-0.4%	-0.4%	-0.1%	-0.3%	-0.3%	-0.4%
Subtotal Price Effects	-1.2%	1.3%	-1.3%	-13.3%	2.4%	-7.9%	-8.0%	0.4%	0.4%	1.6%

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

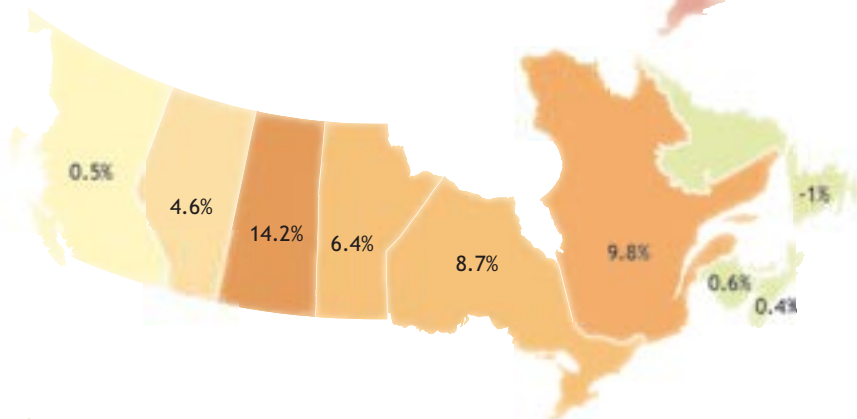
# Hormones and Related Therapy

Determinants of Change in Per Capita Expenditure, 1998-2004

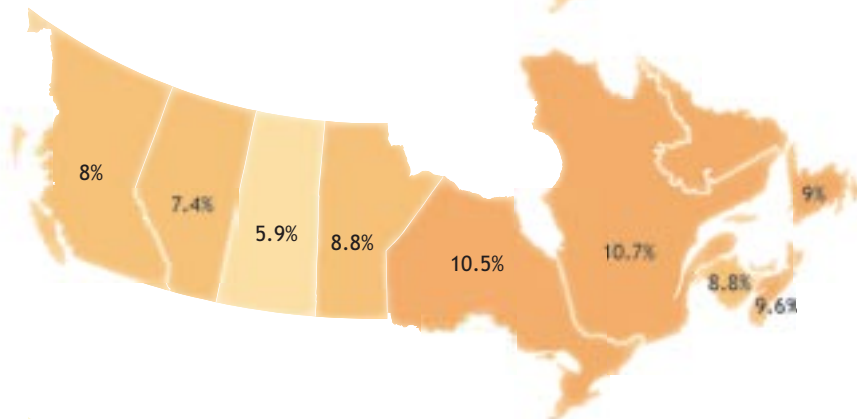
## Overall Growth Rate, 1998-2004



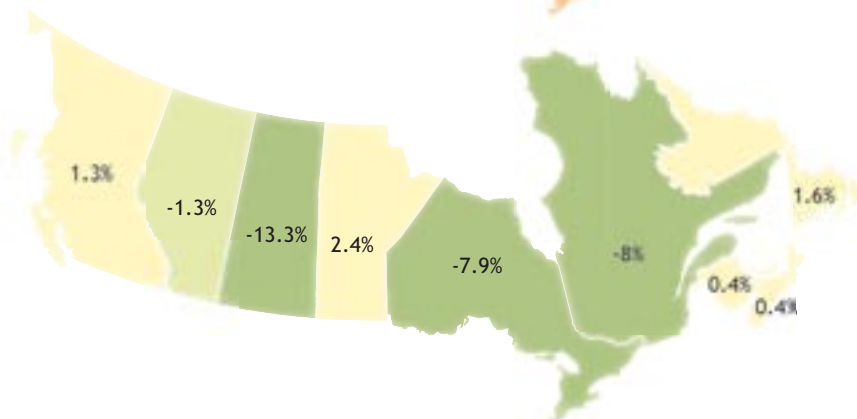
## Volume Effects



## Therapeutic Choices



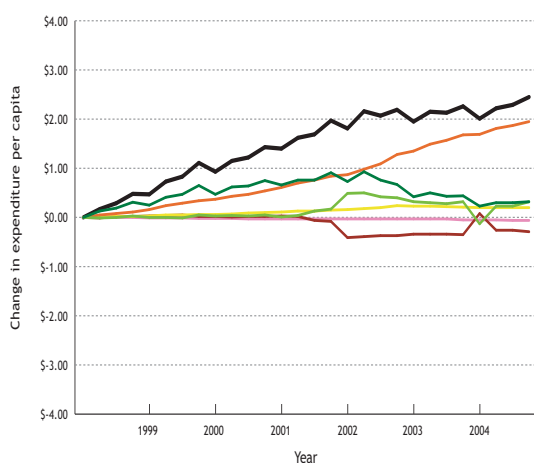
## Price Effects



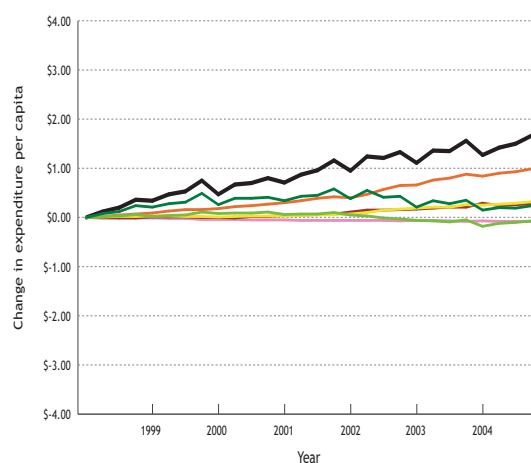
# Hormones and Related Therapy

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

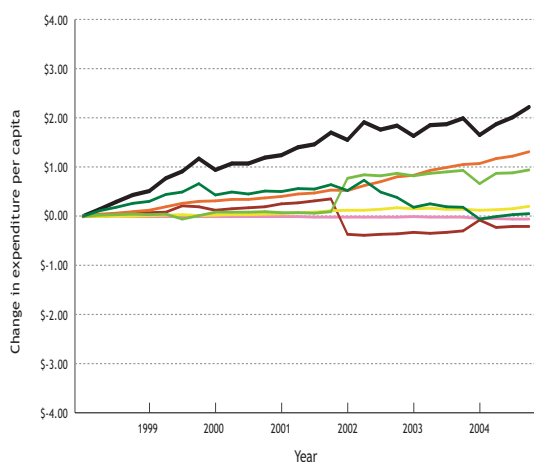
Canada



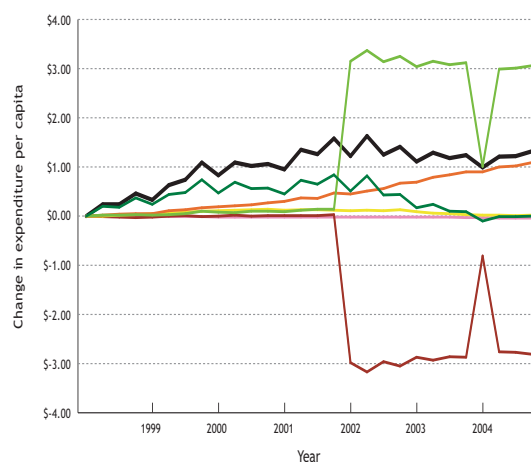
British Columbia



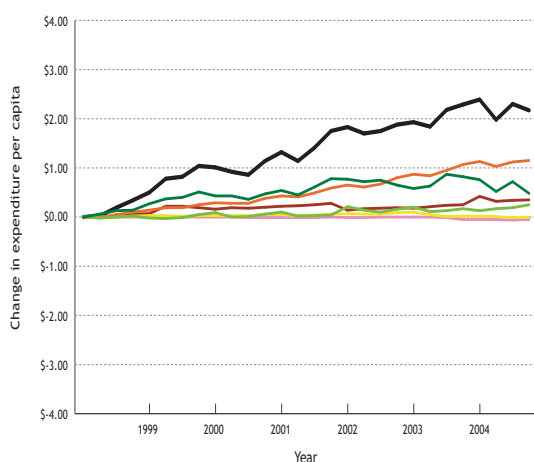
Alberta



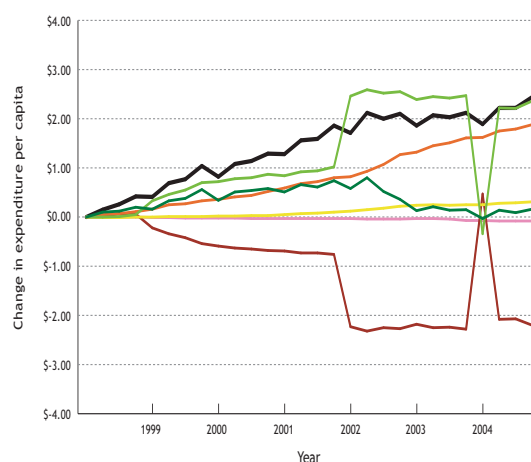
Saskatchewan



Manitoba



Ontario

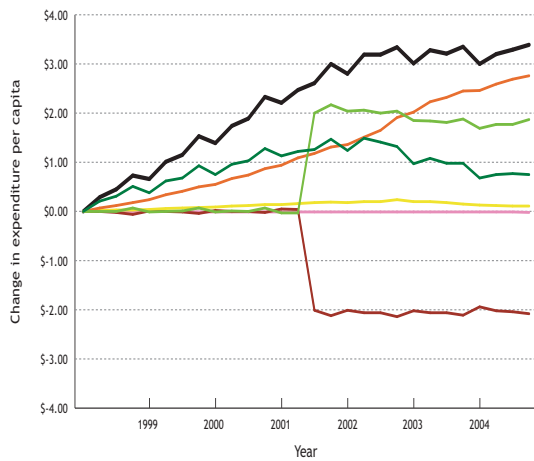


Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

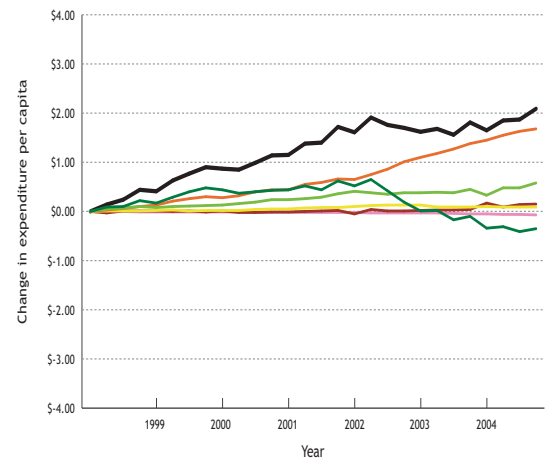
# Hormones and Related Therapy

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

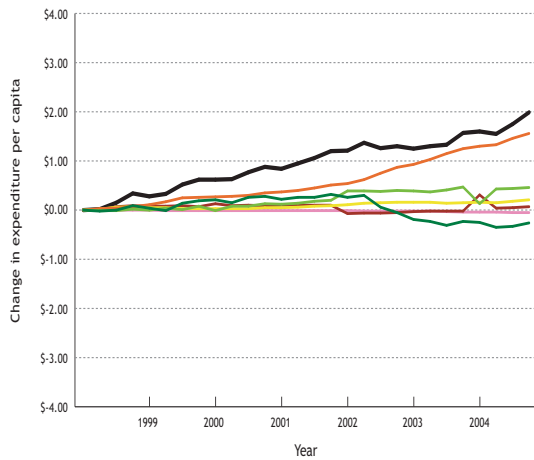
Quebec



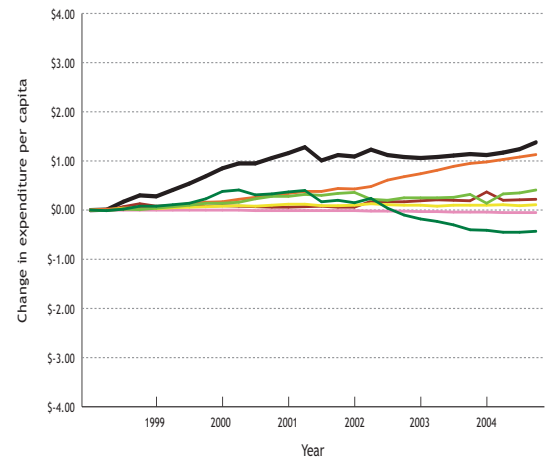
New Brunswick



Nova Scotia

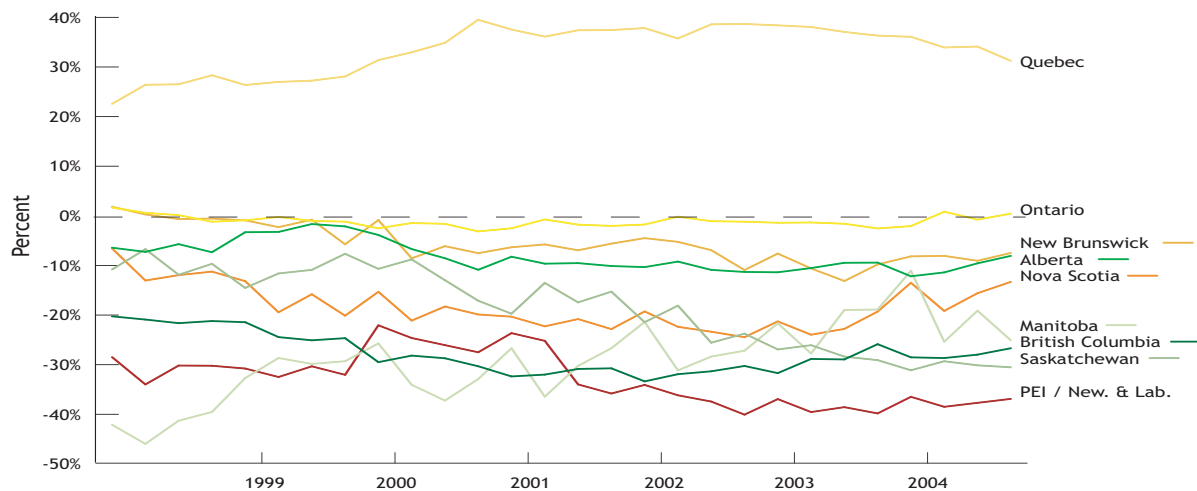


PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, hormones



## Expenditure Levels and Variations

In 2004, Canadians spent \$13 per capita on oral solid prescription drugs for diabetes. All of this spending is for medicines commonly used to treat type-2 diabetes.

The level of per capita expenditure on diabetes therapy varied considerably across provinces. In 2004, per capita expenditure in the provinces varied by \$8 or 88%, from \$9 in British Columbia to \$17 in New Brunswick.

## Determinants of Variation

All determinants affected provincial variation in per capita expenditure on oral solid diabetes therapies.

As with other therapeutics categories, there was an inverse relationship between the Prescription Volume and Prescription Size. After accounting for this relationship, British Columbia, Alberta, and Saskatchewan consumed fewer oral solid diabetes therapies than the Canadian average. Volume Effects were considerably lower in British Columbia and Saskatchewan when compared to other provinces.

Therapeutic Choices also contributed to provincial variation in per capita expenditure on oral solid diabetes treatments. Owing to the fact that oral solid diabetes treatments are a portion of a much larger therapeutic category, the group of oral solid diabetes drugs is comprised largely of a single drug class: medicines for type-2 diabetes. As a result, the impact of Therapeutic Choices comes by way of the Drug Mix, the selection of specific types of drugs within that drug class.

The unit Prices paid for diabetes drugs varied considerably across provinces. This likely reflects the impact of Prescription Size on average prices (including dispensing fees). Residents of Saskatchewan had a higher-than-average rate of Generic Use from within this therapeutic category.

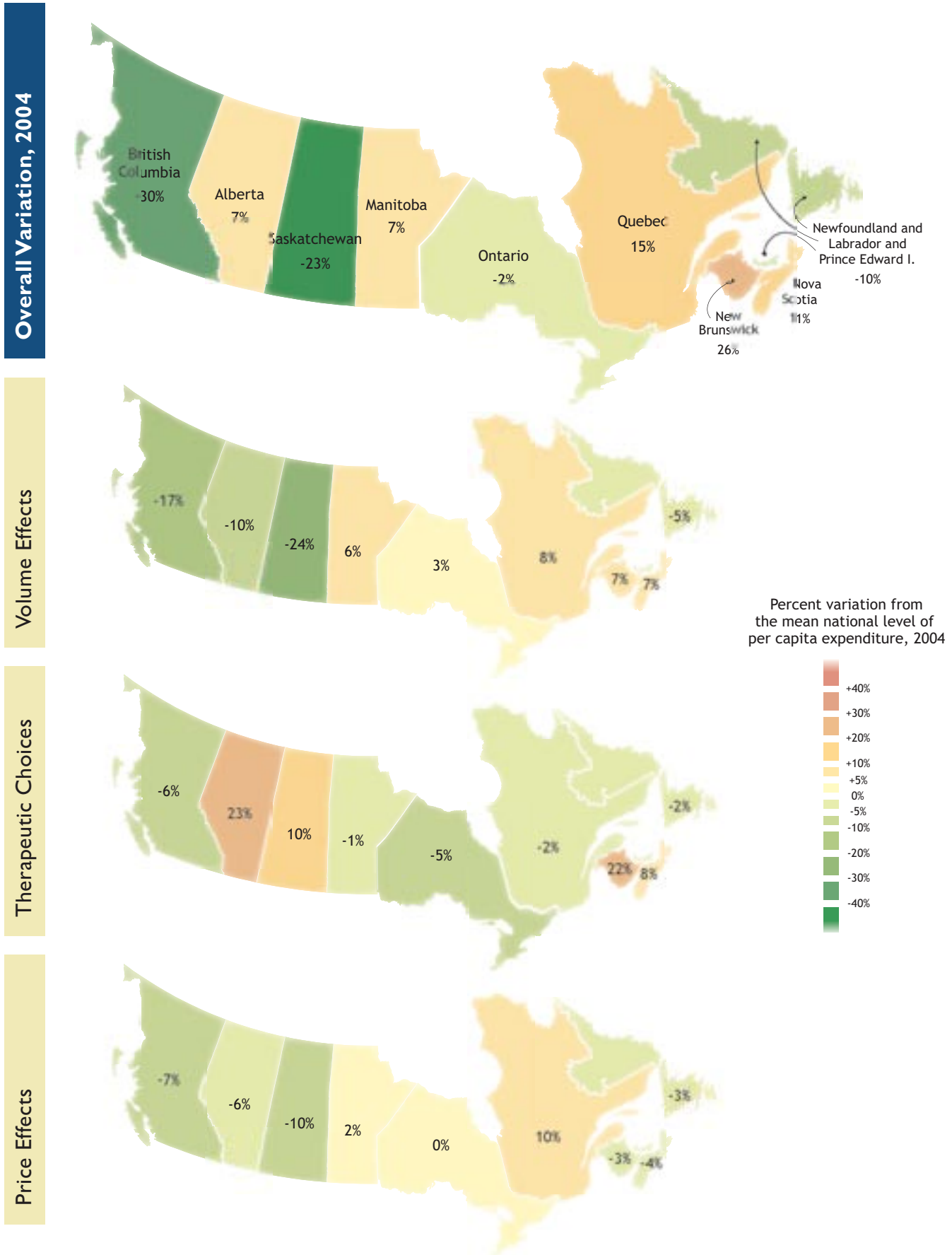
### Percent difference between provincial averages and the national average of drug expenditure, 2004, diabetes drugs

Variable	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in province	\$9	\$14	\$10	\$14	\$13	\$15	\$17	\$15	\$12
Per capita spending in Canada	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13
<b>Total Difference</b>	<b>-30.2%</b>	<b>6.8%</b>	<b>-22.7%</b>	<b>7.0%</b>	<b>-1.6%</b>	<b>15.2%</b>	<b>26.1%</b>	<b>11.1%</b>	<b>-9.9%</b>
Difference due to prescription volume	-42.5%	-40.7%	-21.9%	11.6%	-22.4%	59.5%	-19.6%	-14.5%	-8.1%
Difference due to prescription size	25.6%	30.9%	-1.7%	-5.3%	25.7%	-51.9%	26.7%	20.9%	3.1%
<b>Subtotal Volume Effects</b>	<b>-16.9%</b>	<b>-9.9%</b>	<b>-23.5%</b>	<b>6.3%</b>	<b>3.3%</b>	<b>7.6%</b>	<b>7.1%</b>	<b>6.5%</b>	<b>-5.0%</b>
Difference due to therapeutic mix	-1.1%	-0.2%	-10.6%	-0.6%	0.7%	-0.8%	-1.5%	0.3%	-0.1%
Difference due to drug mix	-5.0%	22.9%	21.0%	-0.2%	-5.8%	-1.3%	23.1%	8.0%	-2.0%
<b>Subtotal Therapeutic Choices</b>	<b>-6.1%</b>	<b>22.7%</b>	<b>10.4%</b>	<b>-0.8%</b>	<b>-5.1%</b>	<b>-2.0%</b>	<b>21.6%</b>	<b>8.4%</b>	<b>-2.2%</b>
Difference due to prices	-6.3%	-5.1%	2.8%	2.0%	-0.1%	7.3%	-1.4%	-2.4%	-2.1%
Difference due to generic use	-0.8%	-0.9%	-12.4%	-0.5%	0.3%	2.4%	-1.2%	-1.3%	-0.7%
<b>Subtotal Price Effects</b>	<b>-7.2%</b>	<b>-6.1%</b>	<b>-9.6%</b>	<b>1.5%</b>	<b>0.2%</b>	<b>9.7%</b>	<b>-2.6%</b>	<b>-3.7%</b>	<b>-2.8%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

# Diabetes Therapy

Determinants of Variation in Per Capita Expenditure, 2004



# Diabetes Therapy

Change in Per Capita Expenditure, 1998-2004

## Pace of Change, 1998 to 2004

Across Canada, per capita expenditure on oral solid diabetes therapy increased by more than 200% from \$4 in 1998 to \$13 in 2004. While per capita expenditure on this drug category was the lowest among the top ten therapeutic categories, the rate of expenditure growth was the fastest.

Annual growth in expenditure on oral solid diabetes drugs varied from 17.5% in Nova Scotia to 32% in Manitoba.

## Determinants of Change

Determinants of change in per capita spending were relatively consistent across provinces: Volume Effects and Therapeutic Choices were significant in all provinces.

Prescription Volume and Prescription Size increased in all provinces (except for Quebec, where prescription size fell slightly). Combined, these Volume Effects caused per capita expenditure on oral solid diabetes drugs to increase at rates ranging from 10.9% per year in Nova Scotia to 20.5% per year in Manitoba. At the latter rate, expenditure per capita would double in less than four years.

Because a single class of drugs dominates this therapeutic category, changes in Therapeutic Mix are inconsequential. However, changes in the Drug Mix selected to treat type-2 diabetes had a significant impact on spending trends. Specifically, increased use of rosiglitazone and pioglitazone drove changes in Drug Mix.

The impact of Price Effects on per capita expenditure was modest over the period of study and across provinces. Most provinces experienced a small decline in Prices and increase in savings from Generic Use.

### Magnitude and determinants of change in per capita spending on oral solid prescription drugs among Canadian provinces, 1998-2004, diabetes drugs

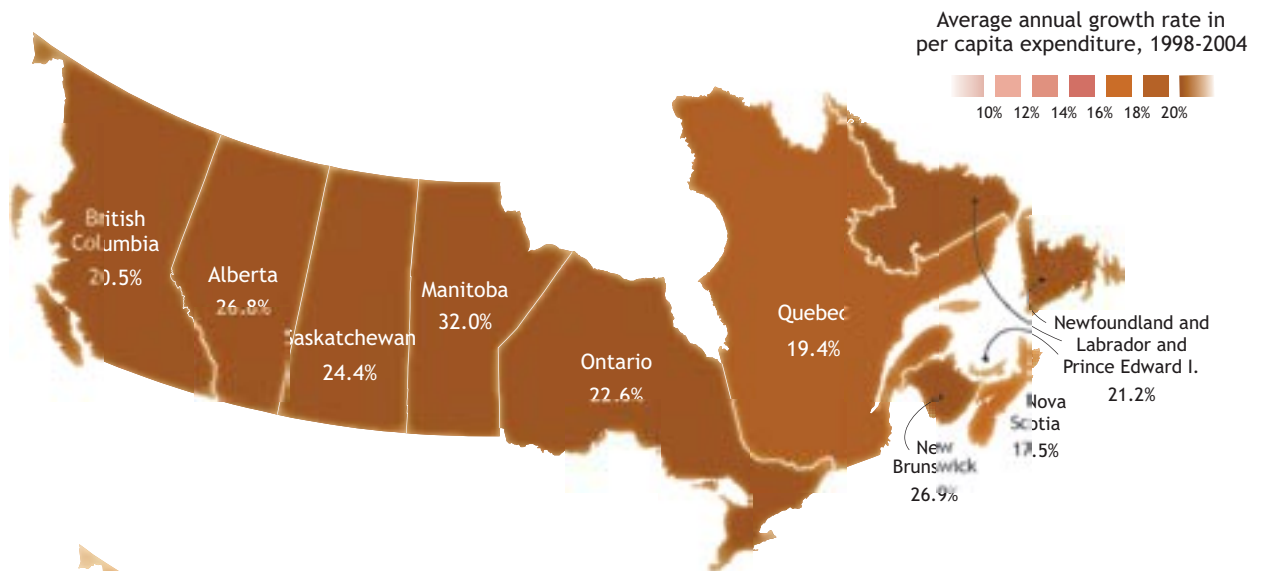
Variable	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PEI/NL
Per capita spending in 1998	\$4	\$3	\$3	\$3	\$3	\$4	\$5	\$4	\$6	\$4
Per capita spending in 2004	\$13	\$9	\$14	\$10	\$14	\$13	\$15	\$17	\$15	\$12
<b>Average Annual Growth (AAG)</b>	<b>22.0%</b>	<b>20.5%</b>	<b>26.8%</b>	<b>24.4%</b>	<b>32.0%</b>	<b>22.6%</b>	<b>19.4%</b>	<b>26.9%</b>	<b>17.5%</b>	<b>21.2%</b>
AAG due to prescription volume	12.3%	13.2%	13.6%	14.0%	18.6%	10.9%	13.5%	8.7%	6.5%	7.4%
AAG due to prescription size	2.0%	2.2%	6.1%	2.1%	1.9%	3.7%	-1.5%	7.2%	4.4%	6.7%
<b>Subtotal Volume Effects</b>	<b>14.2%</b>	<b>15.4%</b>	<b>19.7%</b>	<b>16.0%</b>	<b>20.5%</b>	<b>14.6%</b>	<b>12.0%</b>	<b>16.0%</b>	<b>10.9%</b>	<b>14.2%</b>
AAG due to therapeutic mix	-0.9%	-0.5%	-1.2%	-1.2%	-1.4%	-0.3%	-0.7%	-0.6%	0.3%	-0.1%
AAG due to drug mix	10.1%	6.8%	11.0%	13.5%	11.2%	9.2%	9.1%	14.2%	8.8%	9.7%
<b>Subtotal Therapeutic Choices</b>	<b>9.1%</b>	<b>6.2%</b>	<b>9.8%</b>	<b>12.3%</b>	<b>9.8%</b>	<b>8.9%</b>	<b>8.4%</b>	<b>13.6%</b>	<b>9.0%</b>	<b>9.5%</b>
AAG due to prices	-0.7%	-0.1%	-1.1%	-0.6%	2.4%	-0.6%	-0.5%	-1.9%	-0.9%	-2.0%
AAG due to generic use	-0.7%	-1.0%	-1.6%	-3.3%	-0.6%	-0.2%	-0.5%	-0.8%	-1.5%	-0.5%
<b>Subtotal Price Effects</b>	<b>-1.3%</b>	<b>-1.1%</b>	<b>-2.7%</b>	<b>-3.9%</b>	<b>1.7%</b>	<b>-0.9%</b>	<b>-1.0%</b>	<b>-2.7%</b>	<b>-2.4%</b>	<b>-2.5%</b>

Authors' calculations based on IMS Health (Canadian CompuScript Audit) and Statistics Canada (Population Estimates).

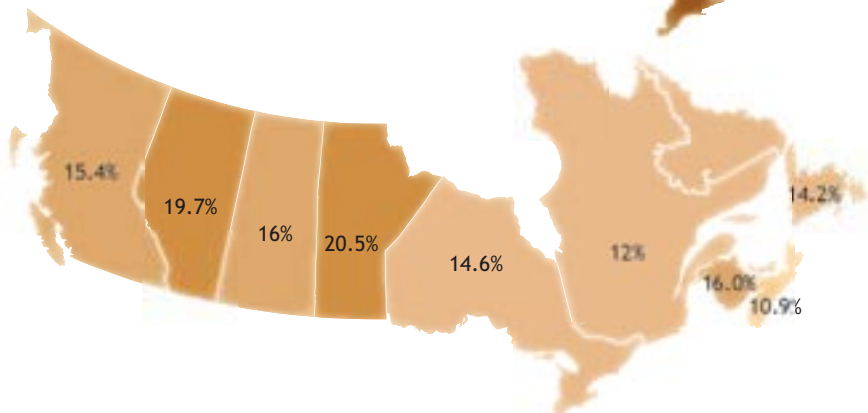
# Diabetes Therapy

Determinants of Change in Per Capita Expenditure, 1998-2004

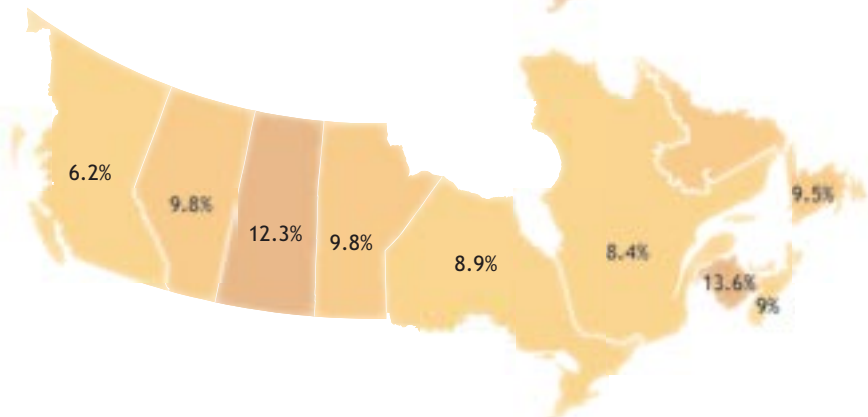
## Overall Growth Rate, 1998-2004



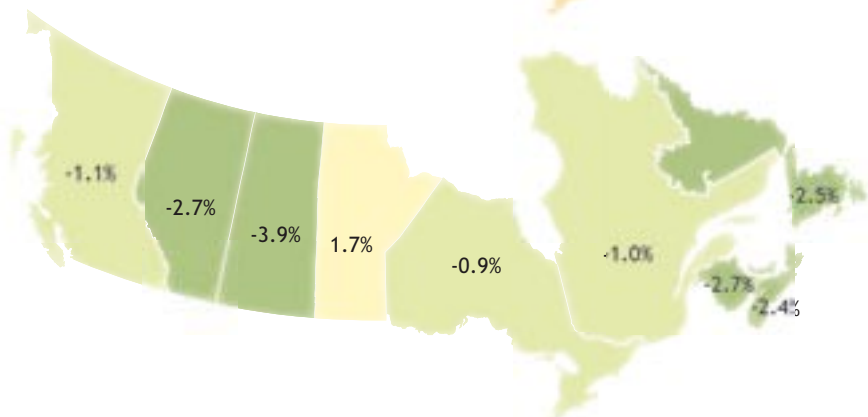
## Volume Effects



## Therapeutic Choices



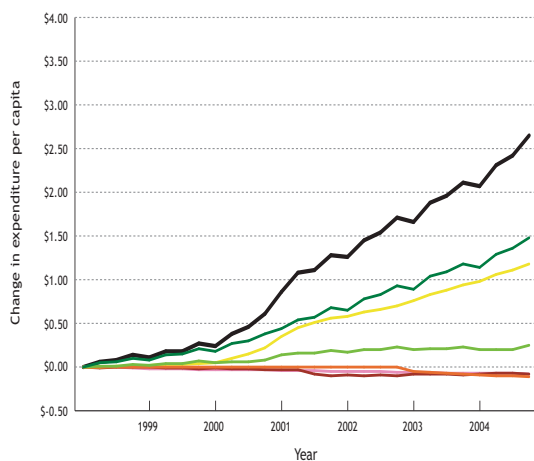
## Price Effects



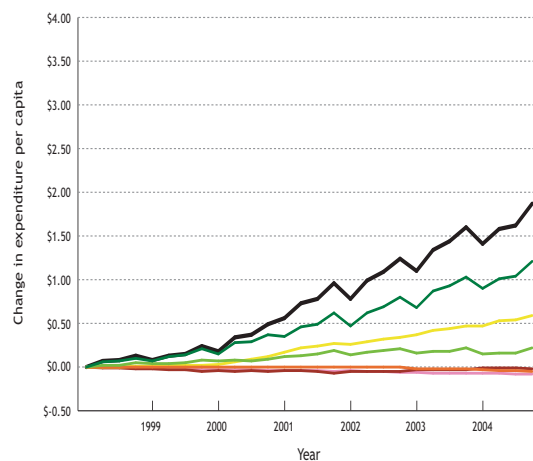
# Diabetes Therapy

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

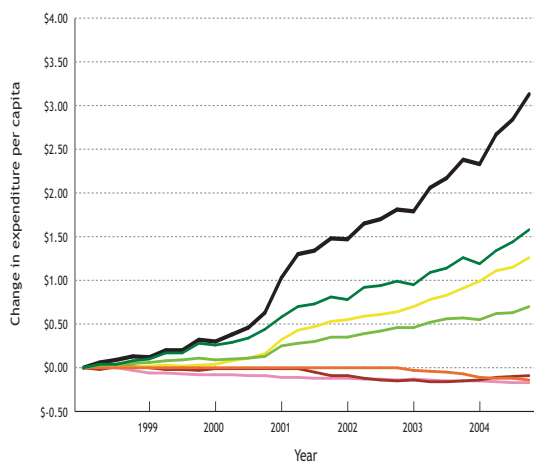
## Canada



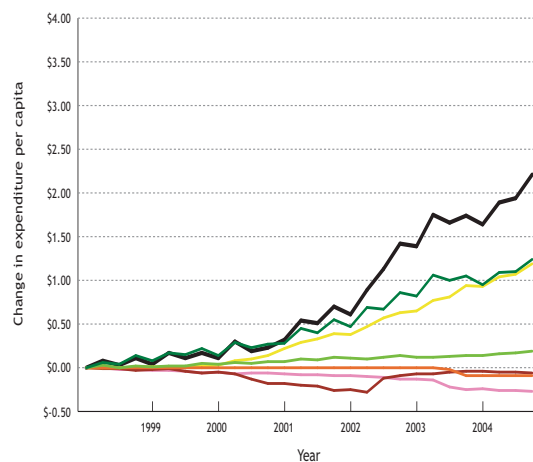
## British Columbia



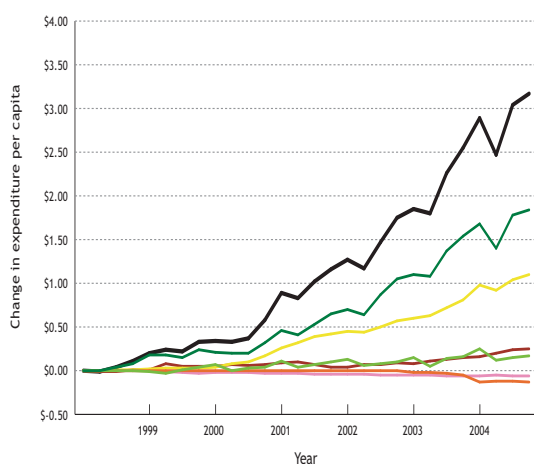
## Alberta



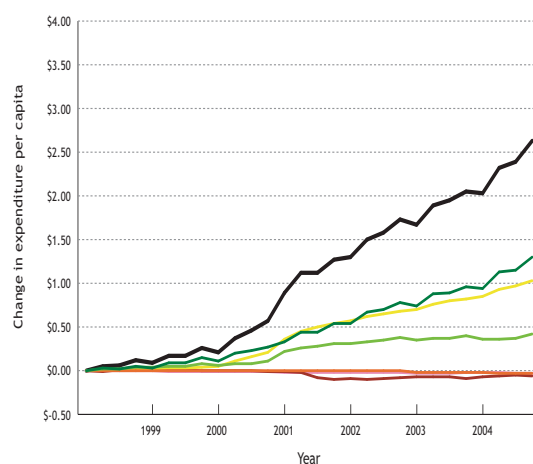
## Saskatchewan



## Manitoba



## Ontario

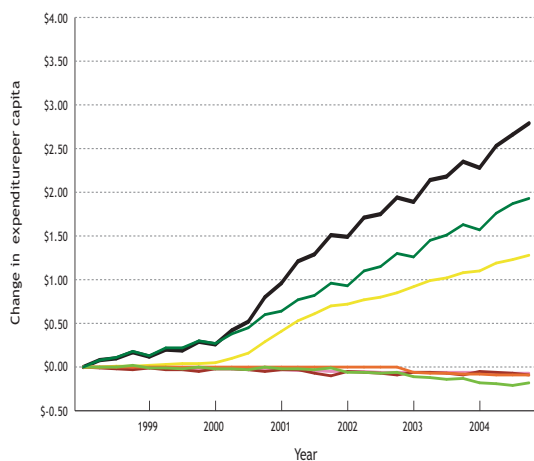


Prescription volume — Prescription size — Drug mix — Total change —  
 Therapeutic mix — Generic use — Price changes —

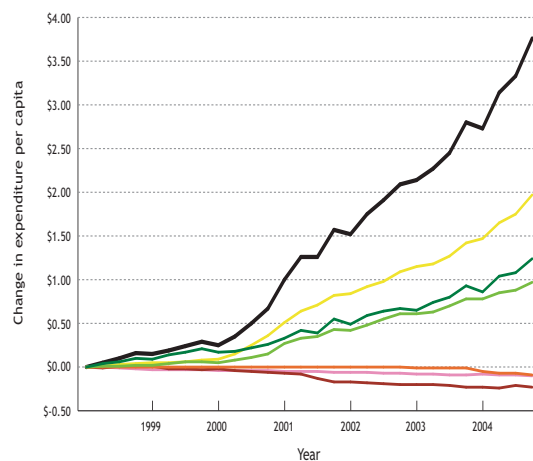
# Diabetes Therapy

Quarterly Trends in Per Capita Expenditure Levels and Variations, 1998-2004

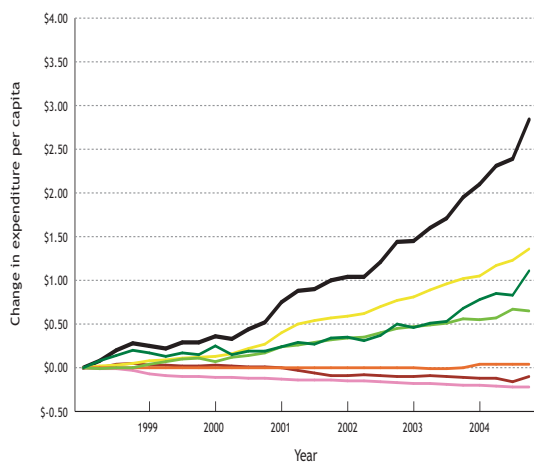
Quebec



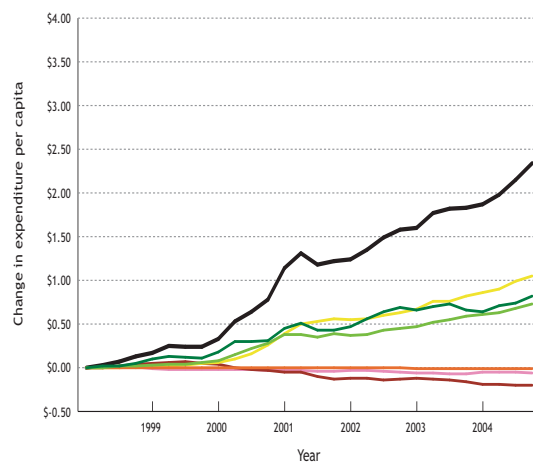
New Brunswick



Nova Scotia



PEI/Newfoundland & Labrador



Prescription volume — Prescription size — Drug mix —  
Therapeutic mix — Generic use — Price changes — Total change —

## Quarterly differences between provincial and national levels of per capita expenditure, 1998-2004, diabetes drugs

