

Health Expenditure Sustainability in Canada: Evidence from Expenditure Categories

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Presentation Prepared for WRTC Health Services Research Seminar,
Johnson-Shoyama School of Public Policy, University of Regina, January
21, 2011

Outline

- Introduction
 - Recent trends in government health expenditure
- What is health expenditure sustainability
 - Concept and measures
 - Evidence on total government health spending
- An expenditure category approach
 - Some health care expenditures are more sustainable than others

Introduction

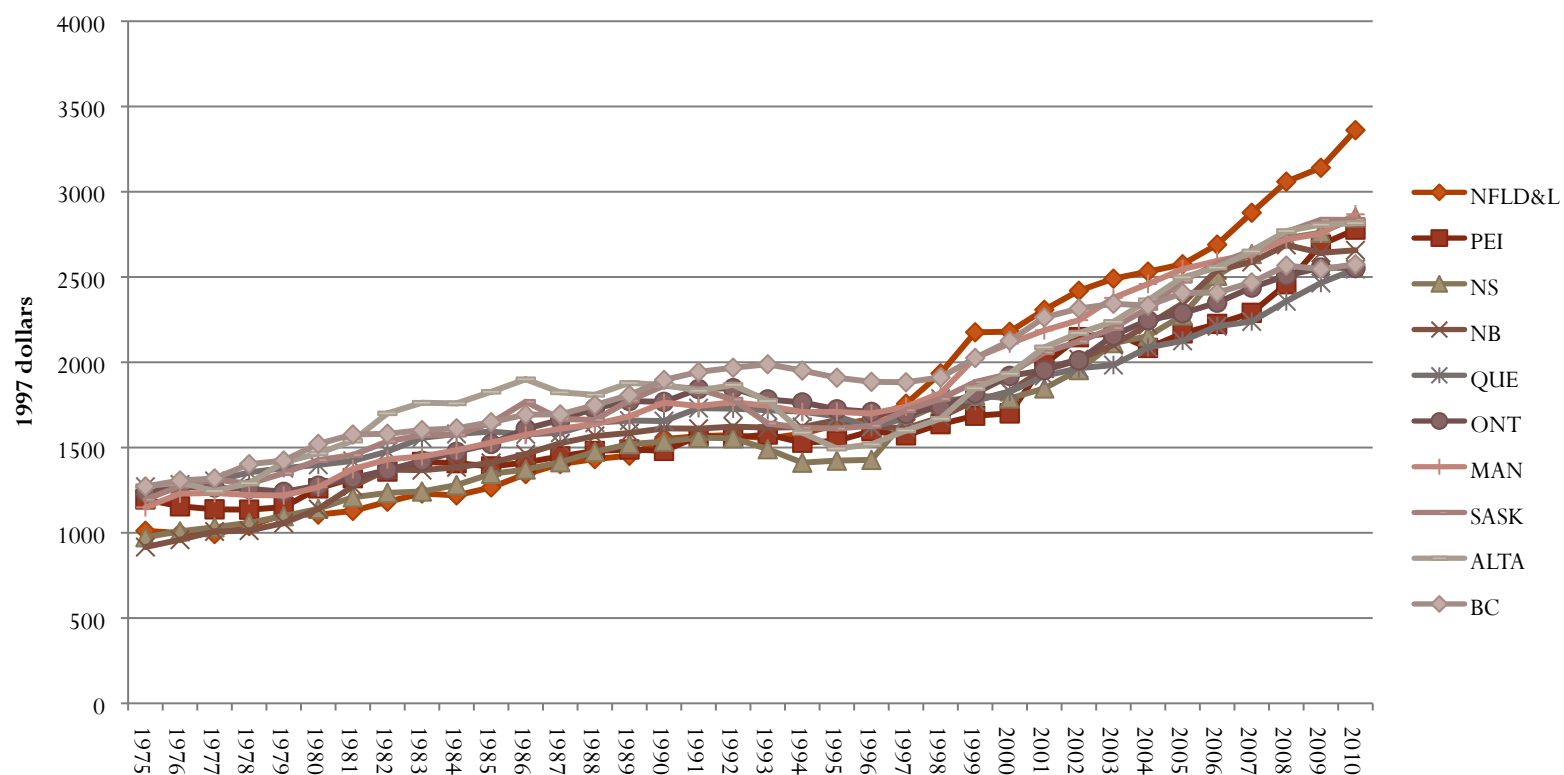
Recent Trends in Government Health Expenditure

Trends in Provincial Government Health Expenditure

- Recent trends show an acceleration in the expenditure curve
- Rising share of provincial government budgets devoted to health

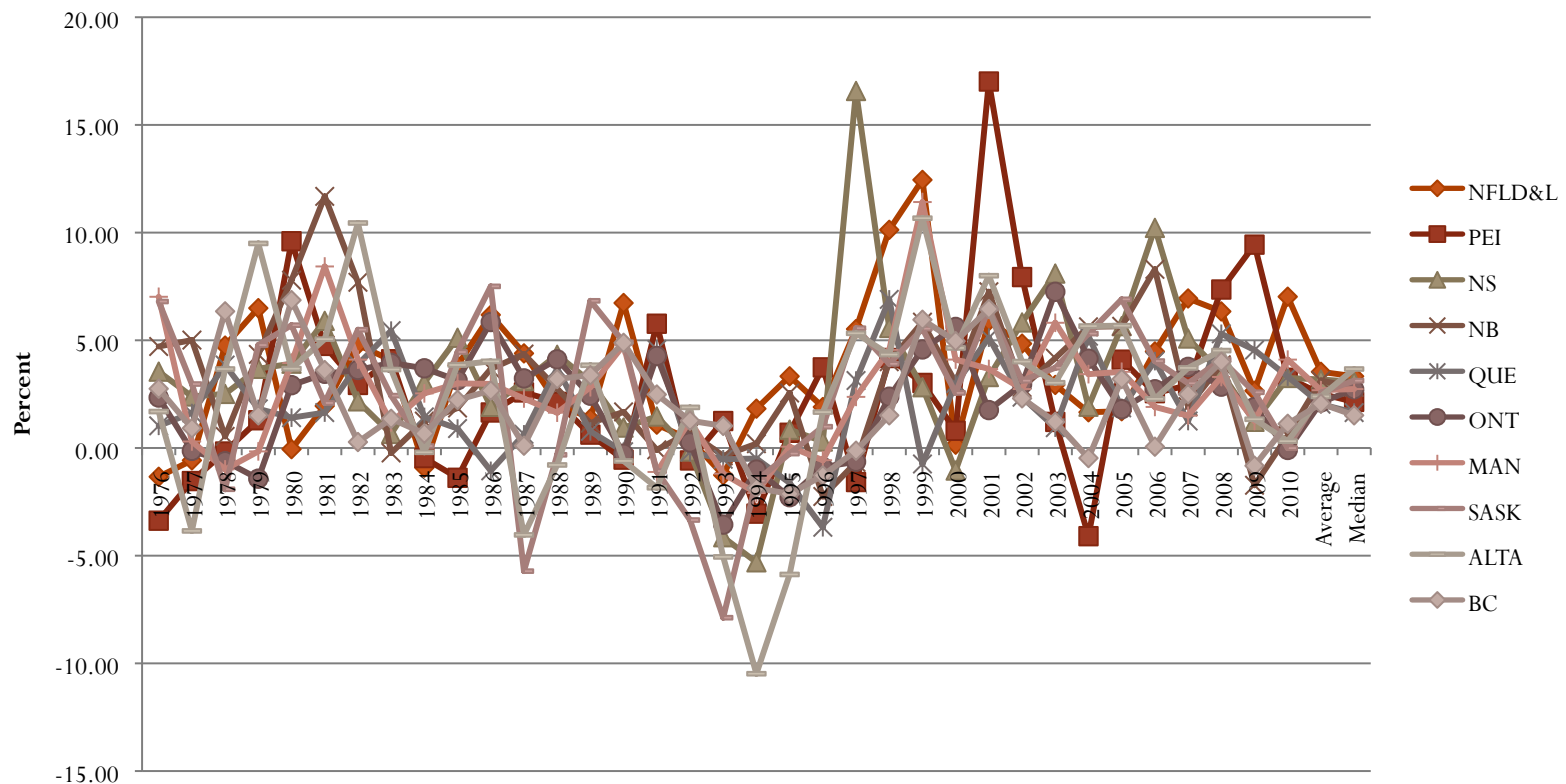
Health Spending is Rising

Real Per Capita Provincial Government Health Spending: 1975-2010



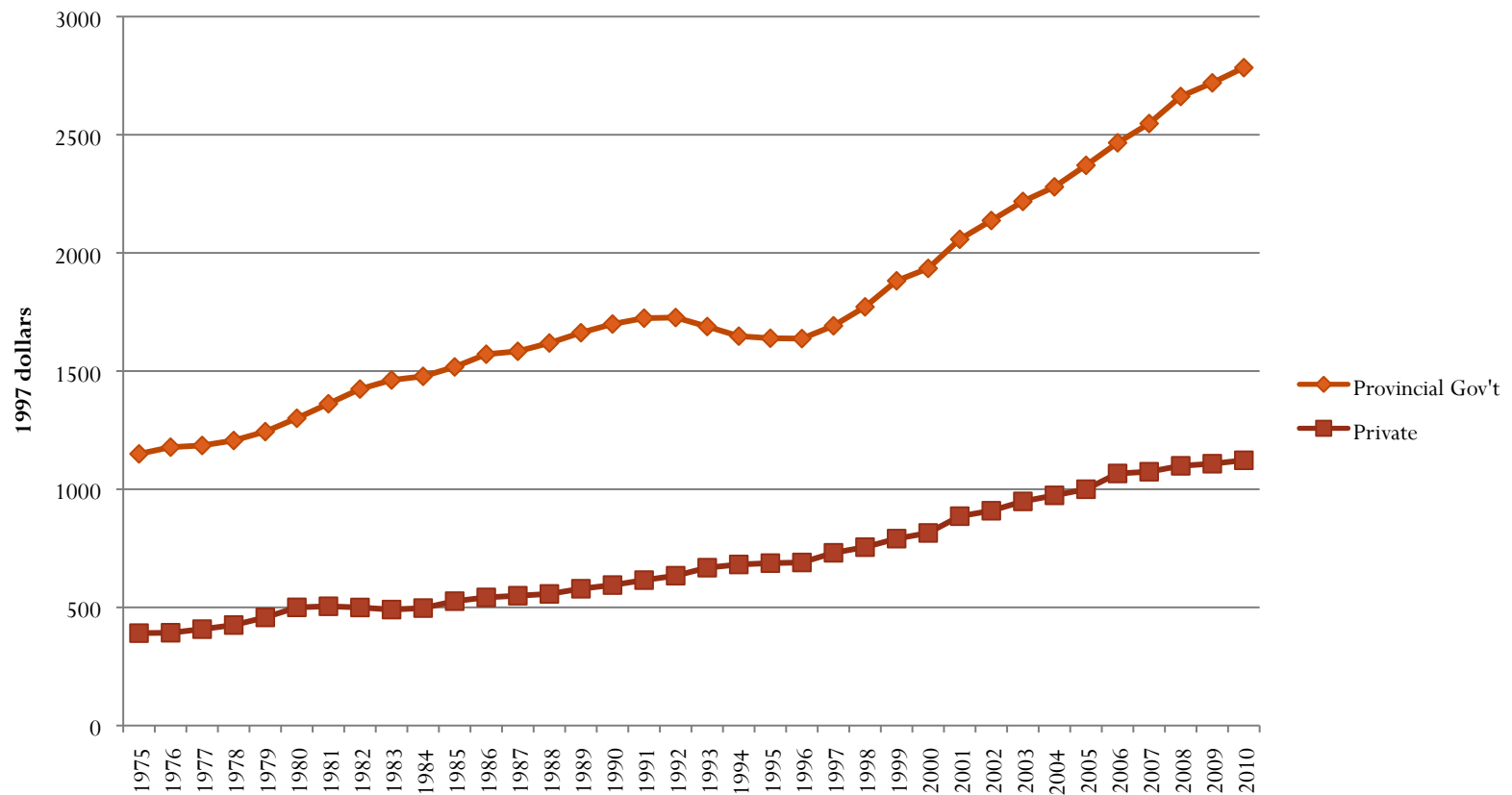
Recent Growth Rates Higher than 1990s

Growth Rates of Real Per Capita Provincial Government Health Expenditures: 1975-2010



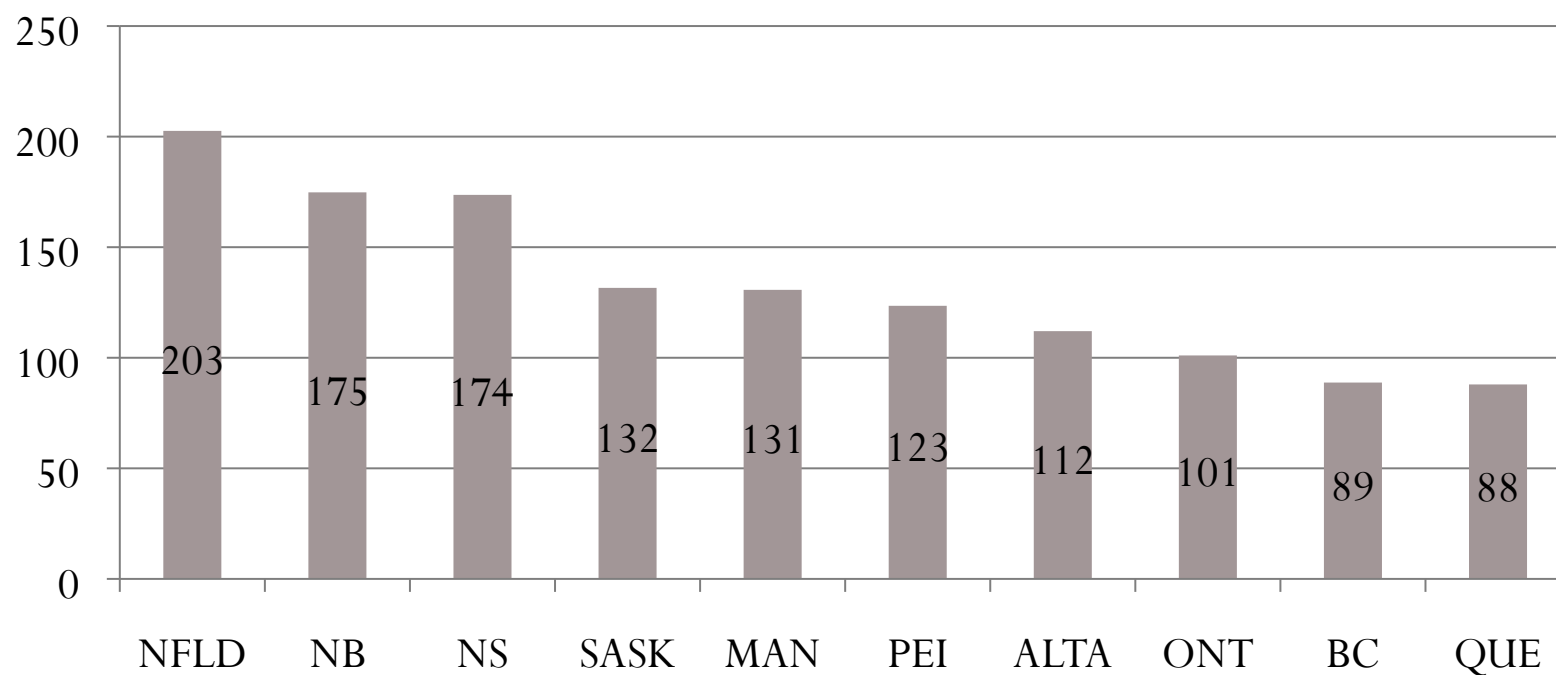
Should We Be Concerned?

Average Real Per Capita Provincial Health Spending



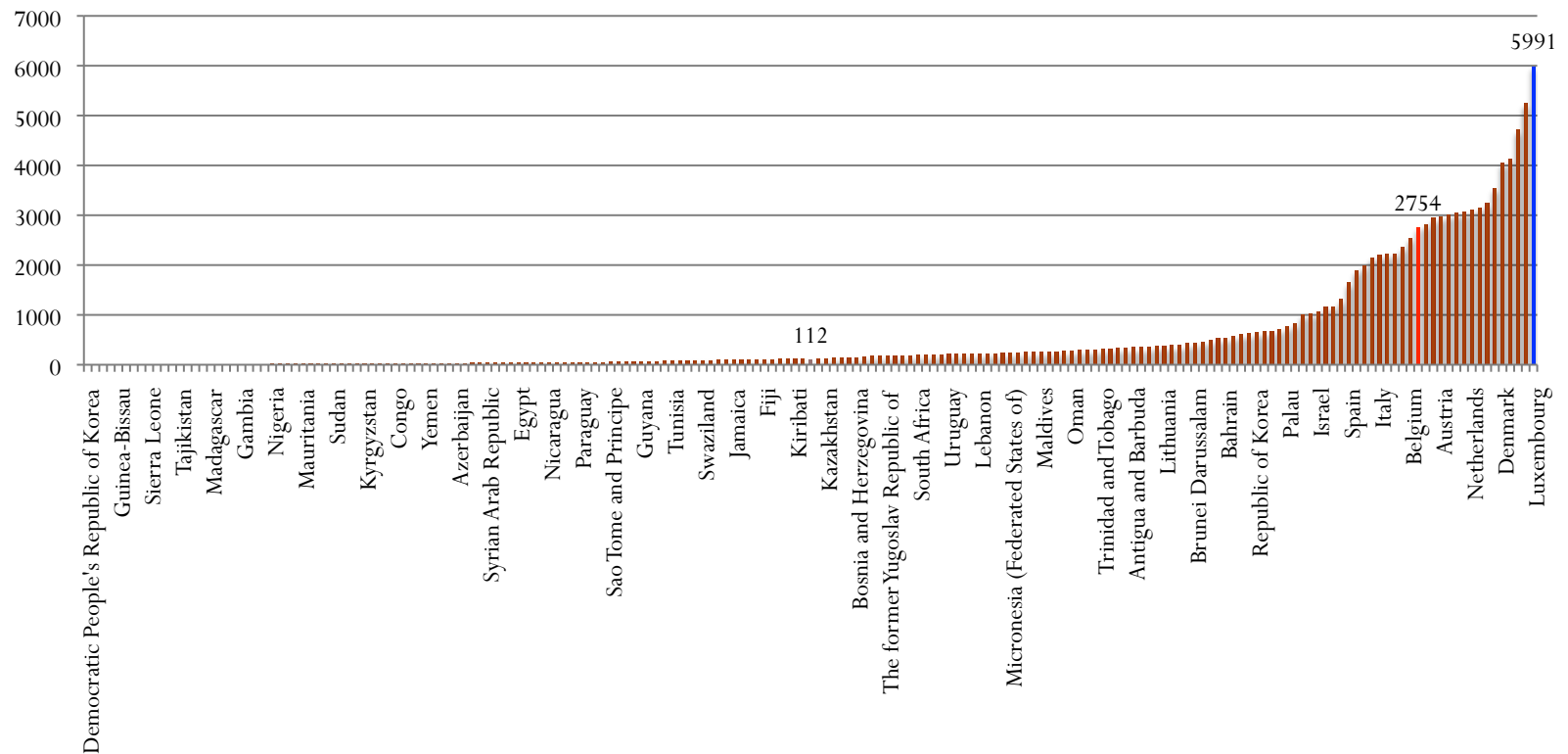
Increases Also Depend on Province

**Ranked Percent Growth in Real Per Capita
Provincial Government Health Expenditures:
1975-2009**

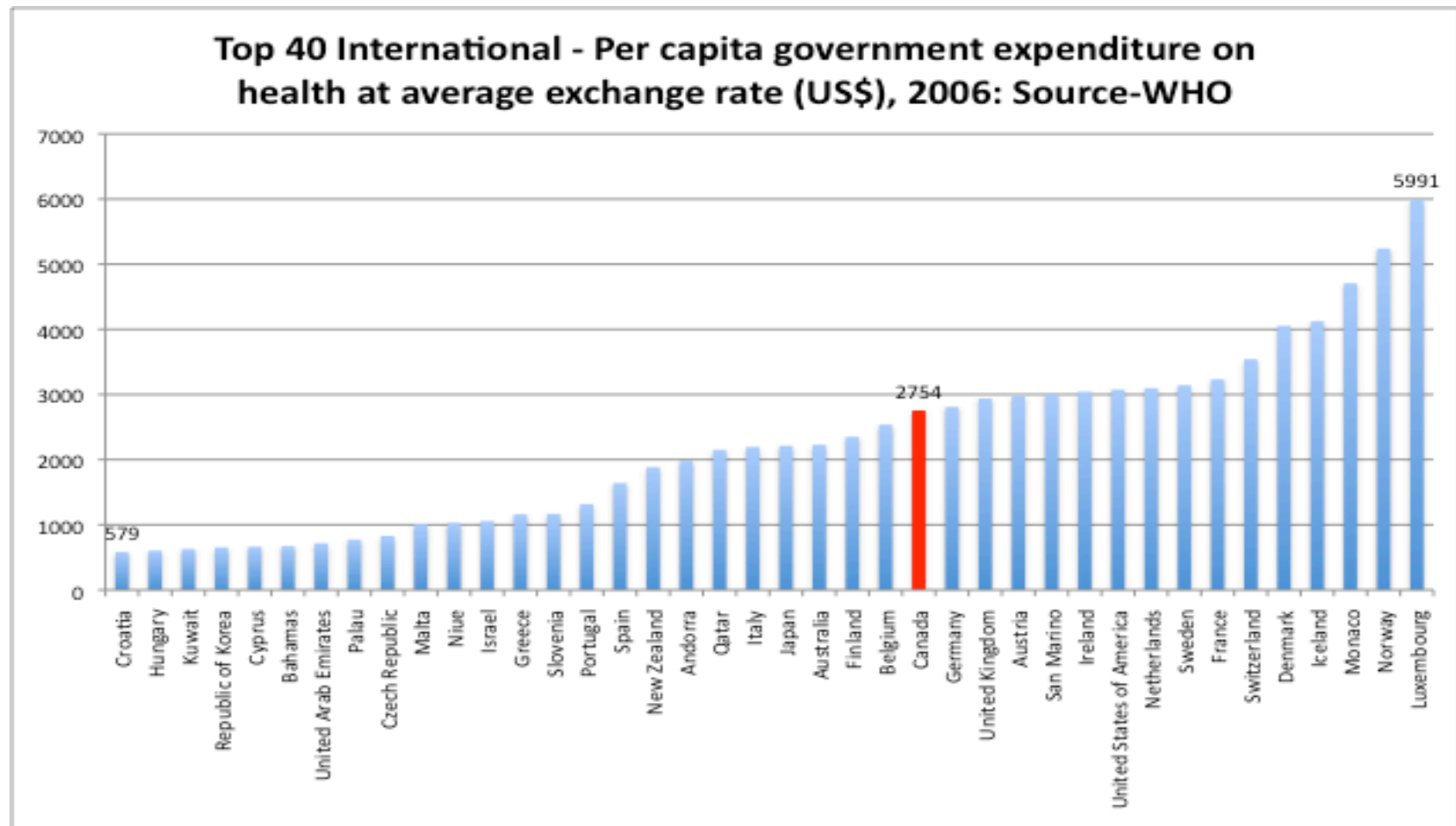


International Context on Government Health Spending

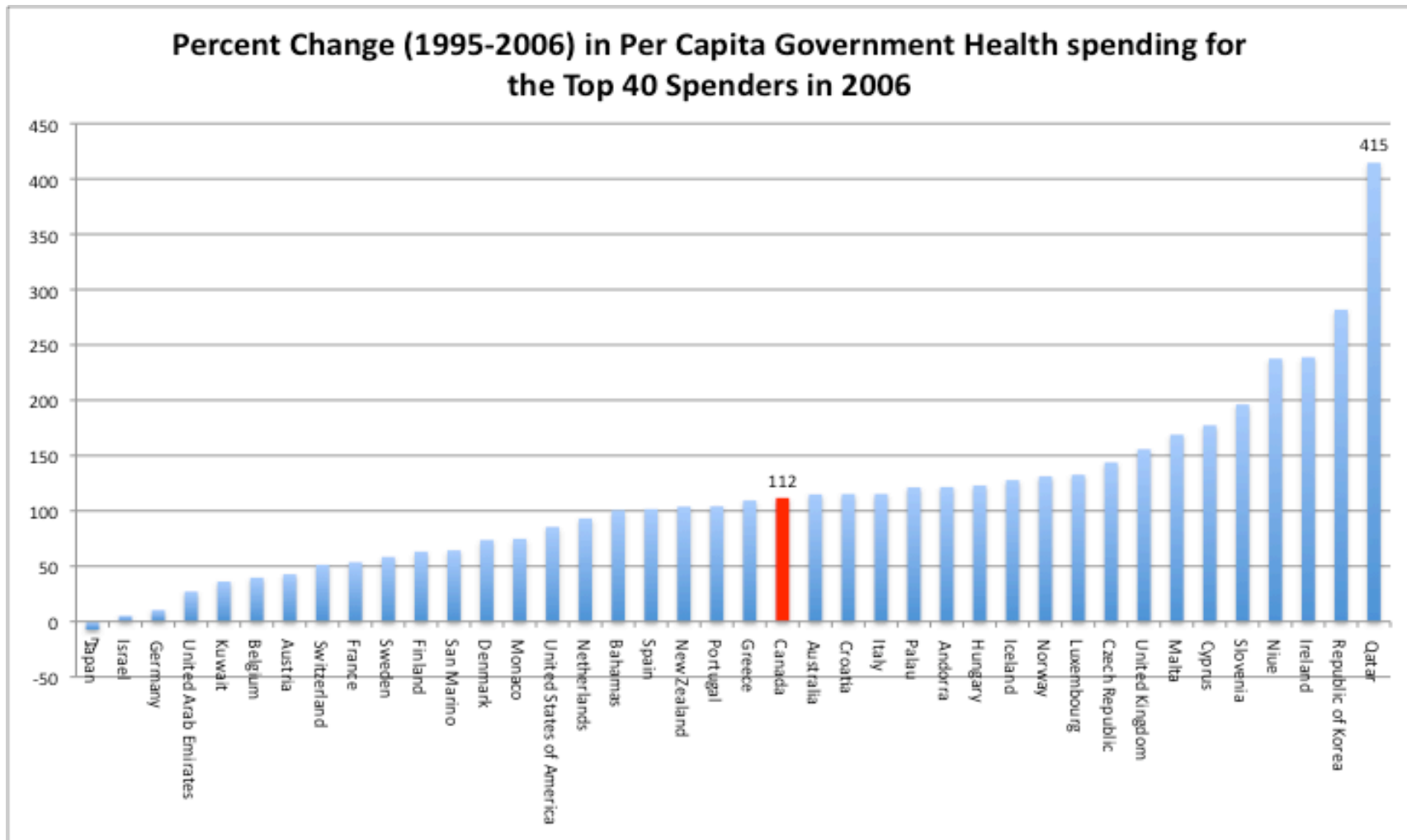
Per capita government expenditure on health at average exchange rate (US\$), 2006: Source-WHO



The Top 40 Spenders



Sustainability is relative...



What is health expenditure
sustainability?

Defining Sustainability

- Sustainability a term with many dimensions:
 - Maintaining a quality health care system
 - Fair access to health care
 - Being able to pay for equitable access and quality
- Marchildon et. al., (2004: 3)

“the sufficiency of resources over the long term to provide timely access to quality services that address Canadians’ evolving health needs.”
- Health sustainability complicated by fact expenditures are a flow of current benefits over time

Fiscal sustainability

- Linking sustainability to payment logical for economists
- Fiscal sustainability means having the money to pay for what you want to do both at present and in the future
- Comley & McKissack (2005)

Public sector fiscal sustainability defined as all “obligations, current and future can be met without changing current policy settings.”
- Fiscally sustainable health spending is where the health needs of all members of the population both current and future can be met with current tax and expenditure settings.

Two Views on Canadian Public Health System Sustainability

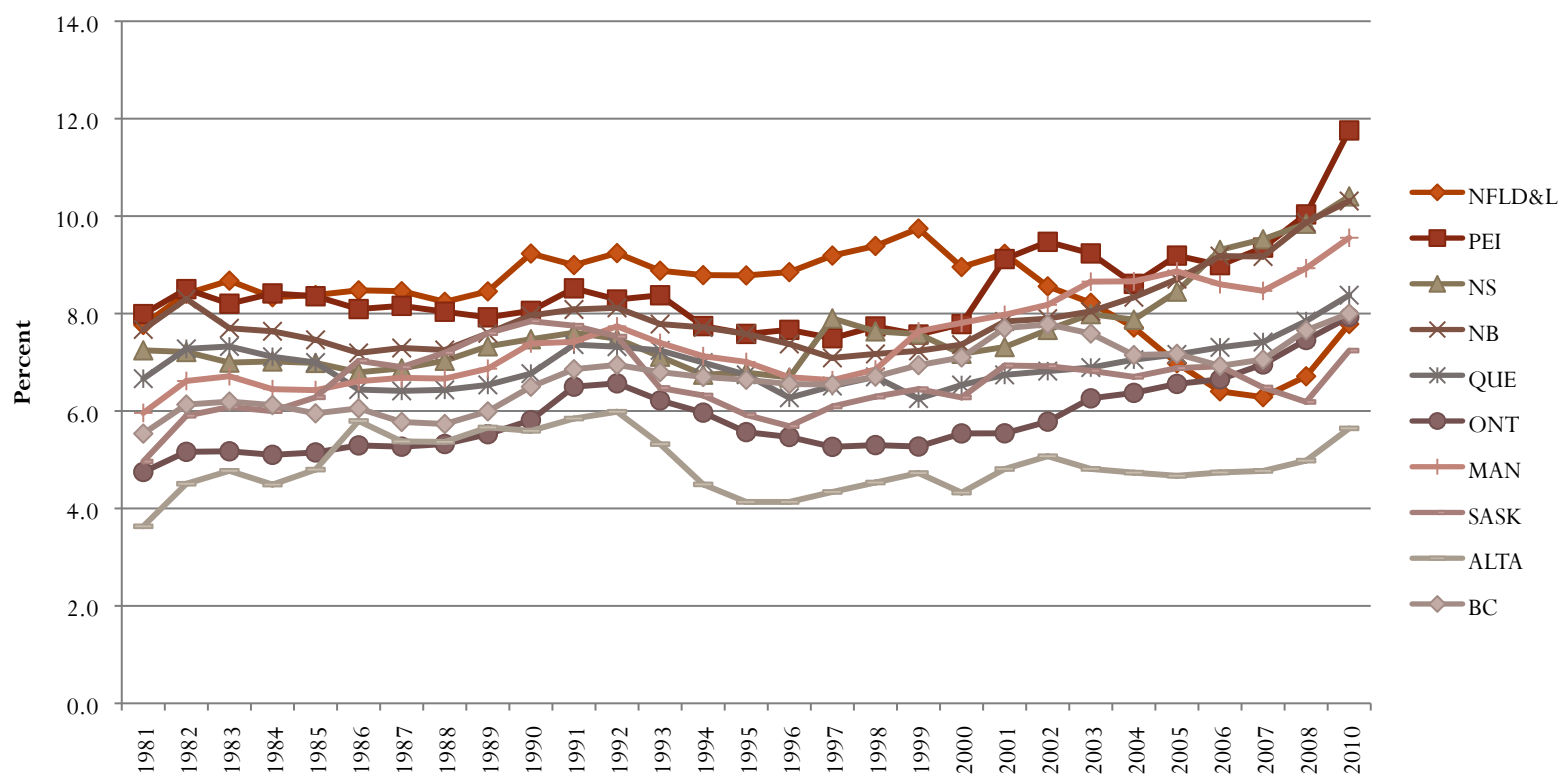
1. Canadian public health care is quite sustainable as the real issue is declining tax bases and changing social values
2. Canadian public health care is marked by rising costs that threaten to overwhelm the system

Measures

- Is H/GDP ratio rising?
- Is H/G ratio rising?
- Compare expenditure growth rates (h) to resource base growth measures (r):
 - Growth of real per capita provincial government health expenditures
 - Growth of real per capita income
 - Growth of real per capita total provincial government revenues
 - Growth of real per capita federal cash transfers
- If $h > r$, there is a sustainability problem.

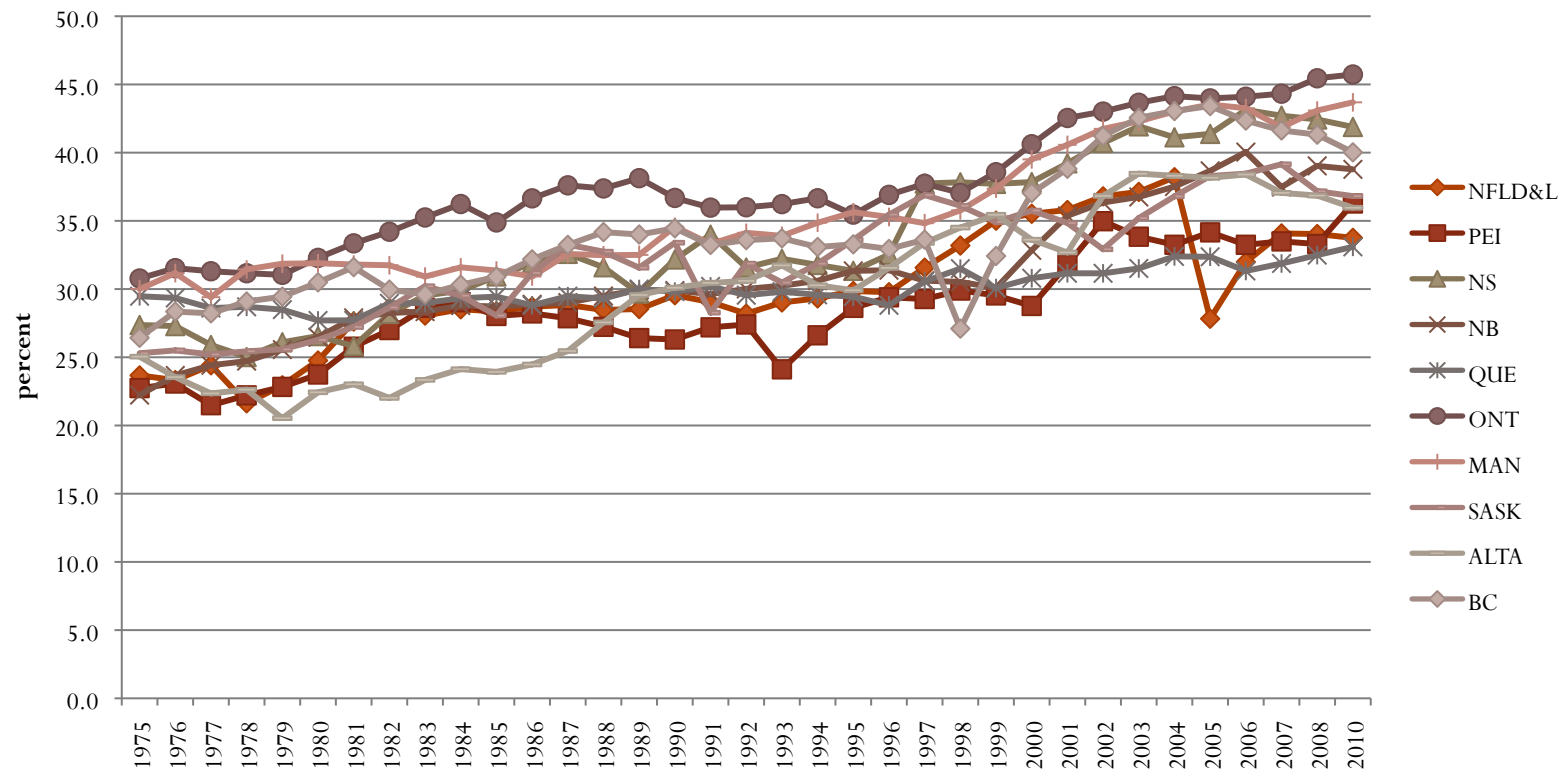
Rising share of GDP

**Provincial Government Health Spending as a Share of GDP:
1981-2010**



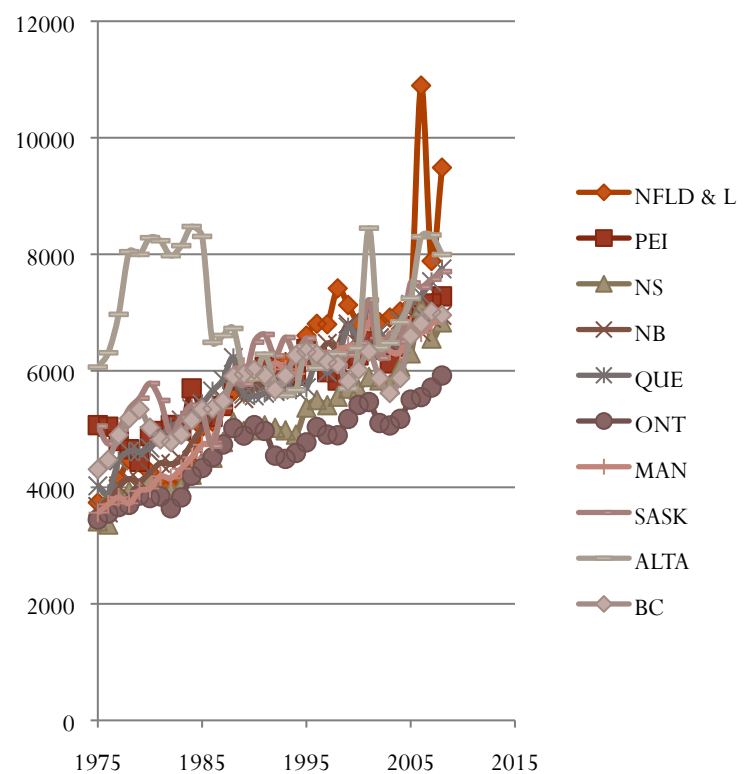
Rising share of government spending

Provincial Government Health Spending as a Share of Program Spending: 1975-2010

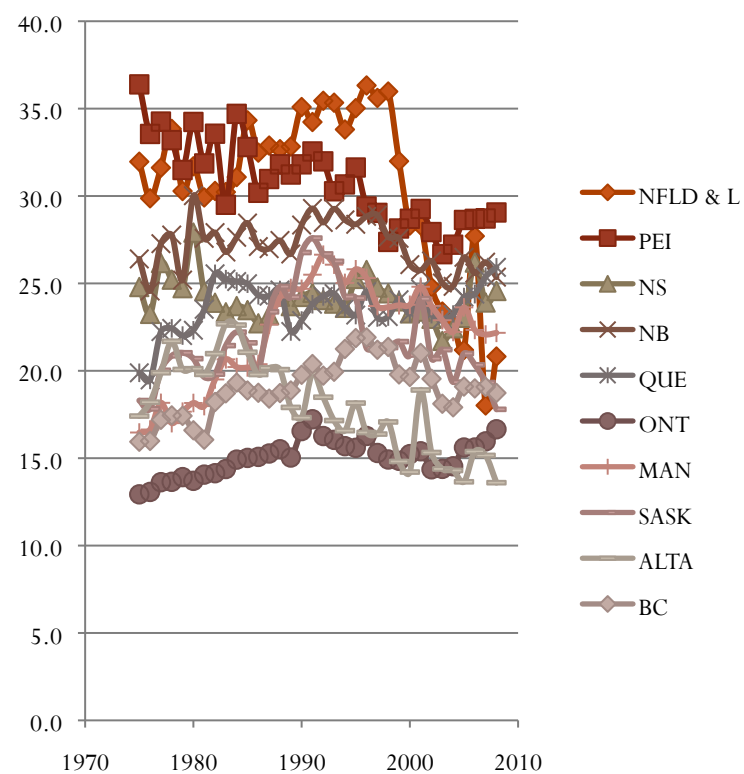


Is It Simply A Revenue Problem?

**Real Per Capita Provincial
Government Revenue(1997\$)**



**Provincial Revenue to GDP
(%)**



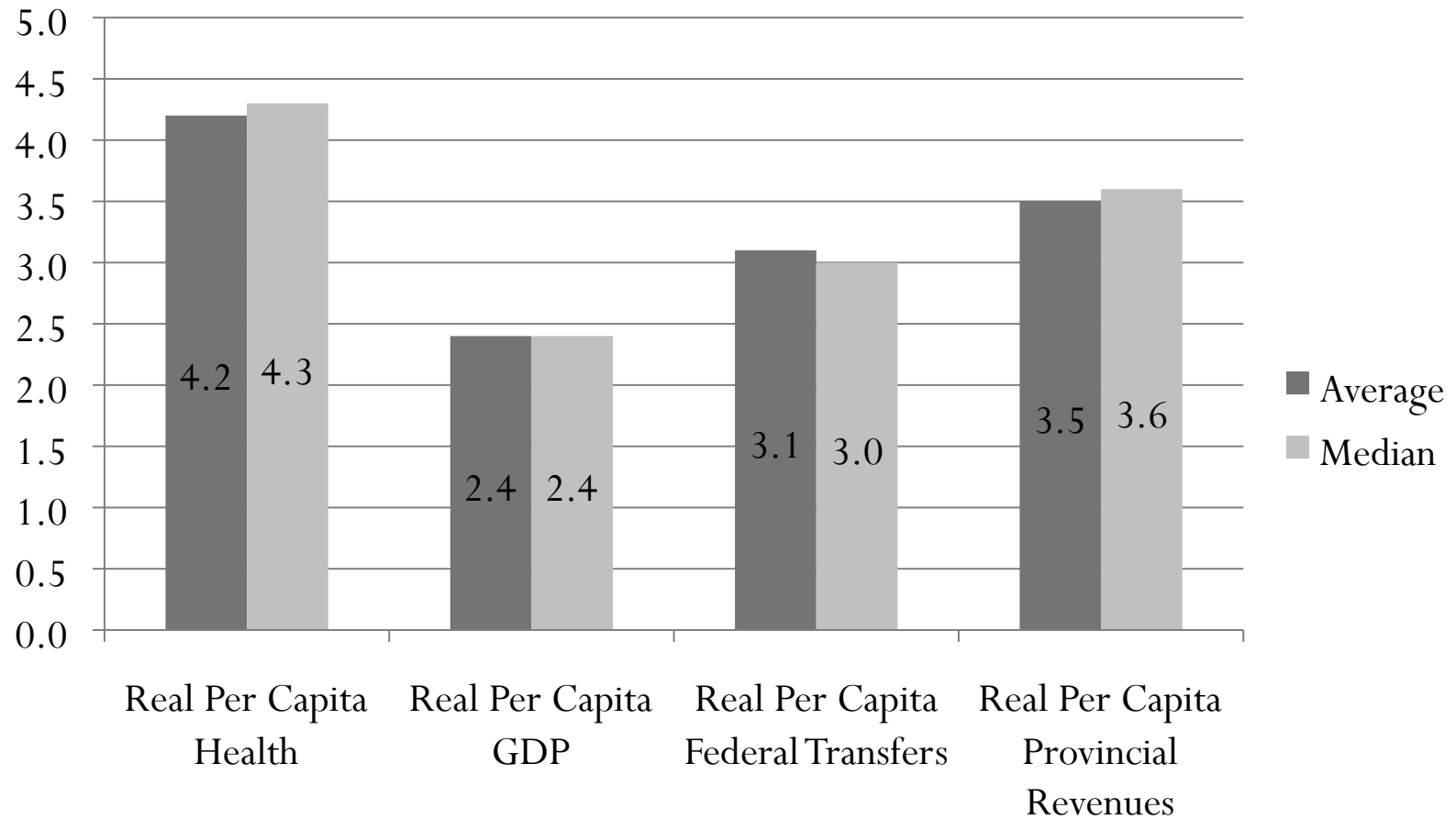
Growth Rates to Measure Sustainability

Table 1 Implied annual growth rates of real per capita

provincial government health spending and sustainability comparison variables (1966–2008). *RHLTPGC* real per capita provincial government health spending, *RGDPC* real per capita GDP, *RFEDTRANSC* Real per capita provincial government federal cash transfer revenue, *RPROVGREVC* real per capita provincial government revenues, *PROP65* proportion of population aged 65 years and over, *POP* provincial population

Province	RHLTPGC	RGDPC	RFEDTRANSC	RPROVGREVC	PROP65	POP
Newfoundland	4.7	4.2	3.3	4.2	2.0	0.1
Prince Edward Island	4.0	2.3	2.4	3.2	1.0	0.6
Nova Scotia	4.7	2.7	5.2	4.0	1.3	0.5
New Brunswick	4.4	2.5	2.8	3.6	1.4	0.5
Quebec	3.7	1.9	3.3	3.7	2.1	1.0
Ontario	4.1	1.5	3.1	3.0	1.1	1.5
Manitoba	4.3	1.9	3.7	3.6	1.0	0.5
Saskatchewan	3.3	2.4	2.6	3.2	1.1	0.1
Alberta	4.2	2.8	1.4	3.5	1.0	2.1
British Columbia	4.3	1.5	2.8	2.7	1.0	2.1
Average	4.2	2.4	3.1	3.5	1.3	0.9
Median	4.3	2.4	3.0	3.6	1.1	0.6

Canadian Provincial Growth Rates: 1965-2008



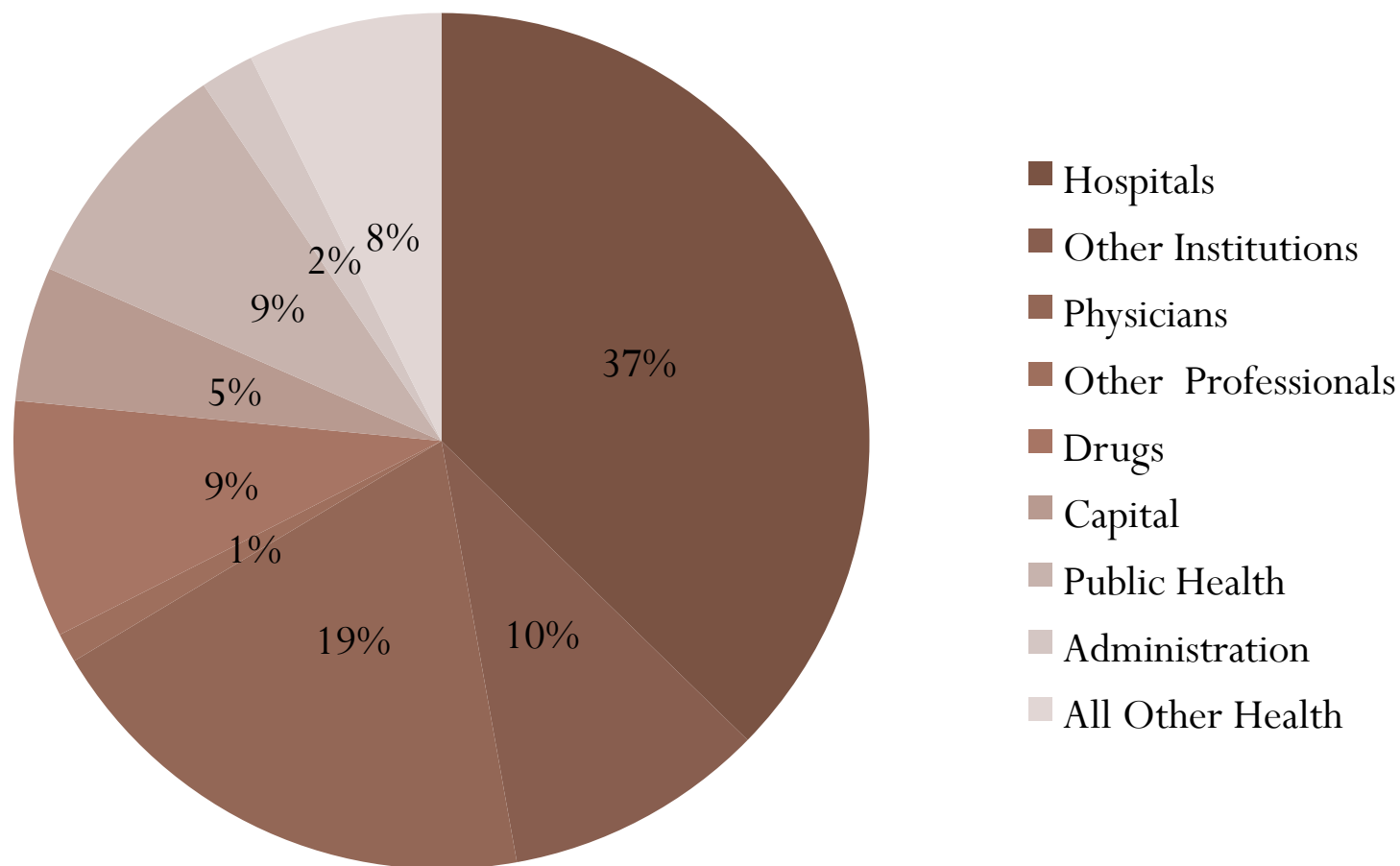
Criticisms of this approach to sustainability

- Figures for 1965-2008 include the first decade of public health care: atypical – upward spending bias due to start-up
- Only looks at provincial government health spending from a total perspective – one needs to break the spending down by categories as well as province.
- The best answer to the question of whether Canadian health care spending is sustainable is:

“It depends”

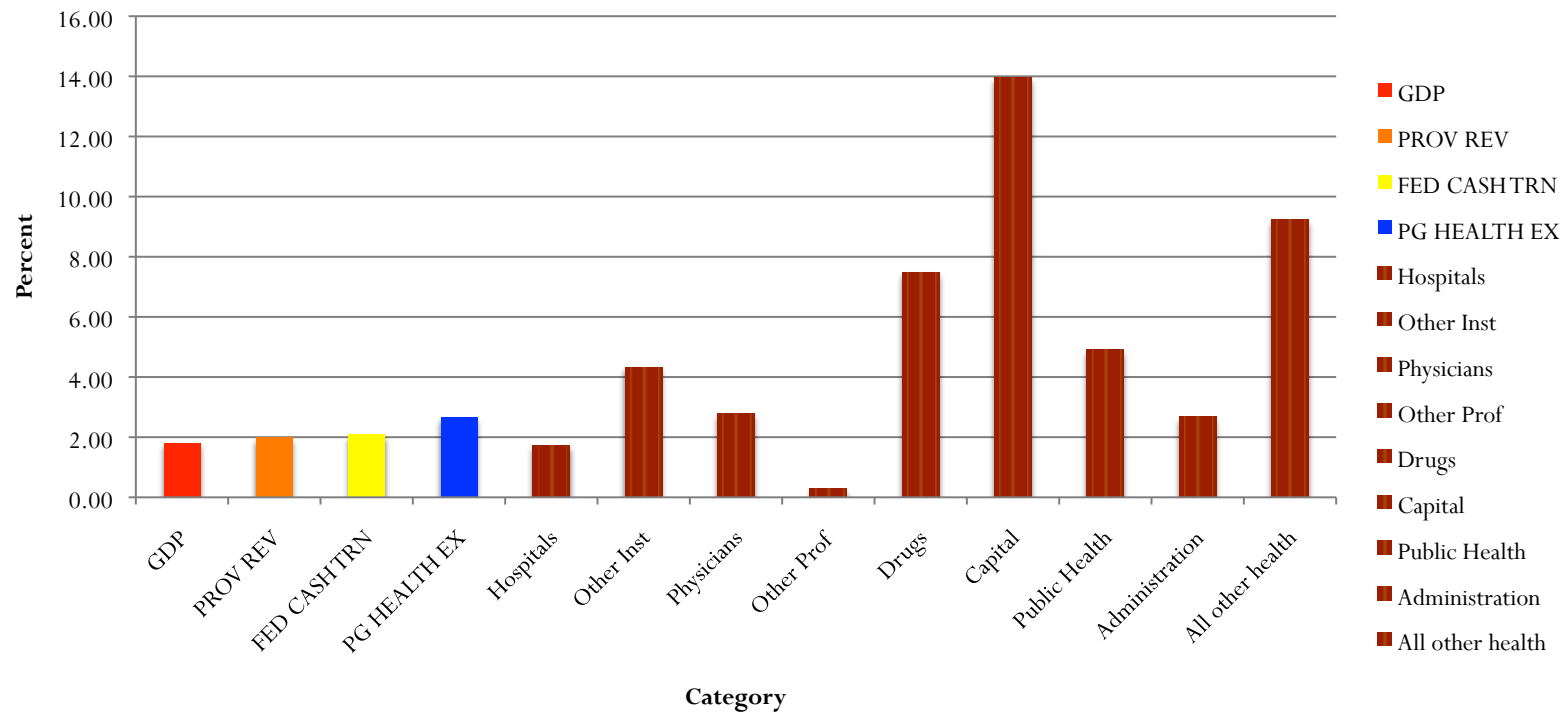
An expenditure category approach

Distribution of Public Sector Health Expenditures in Canada: 2010



Framing the Issue: Expenditure Category Approach

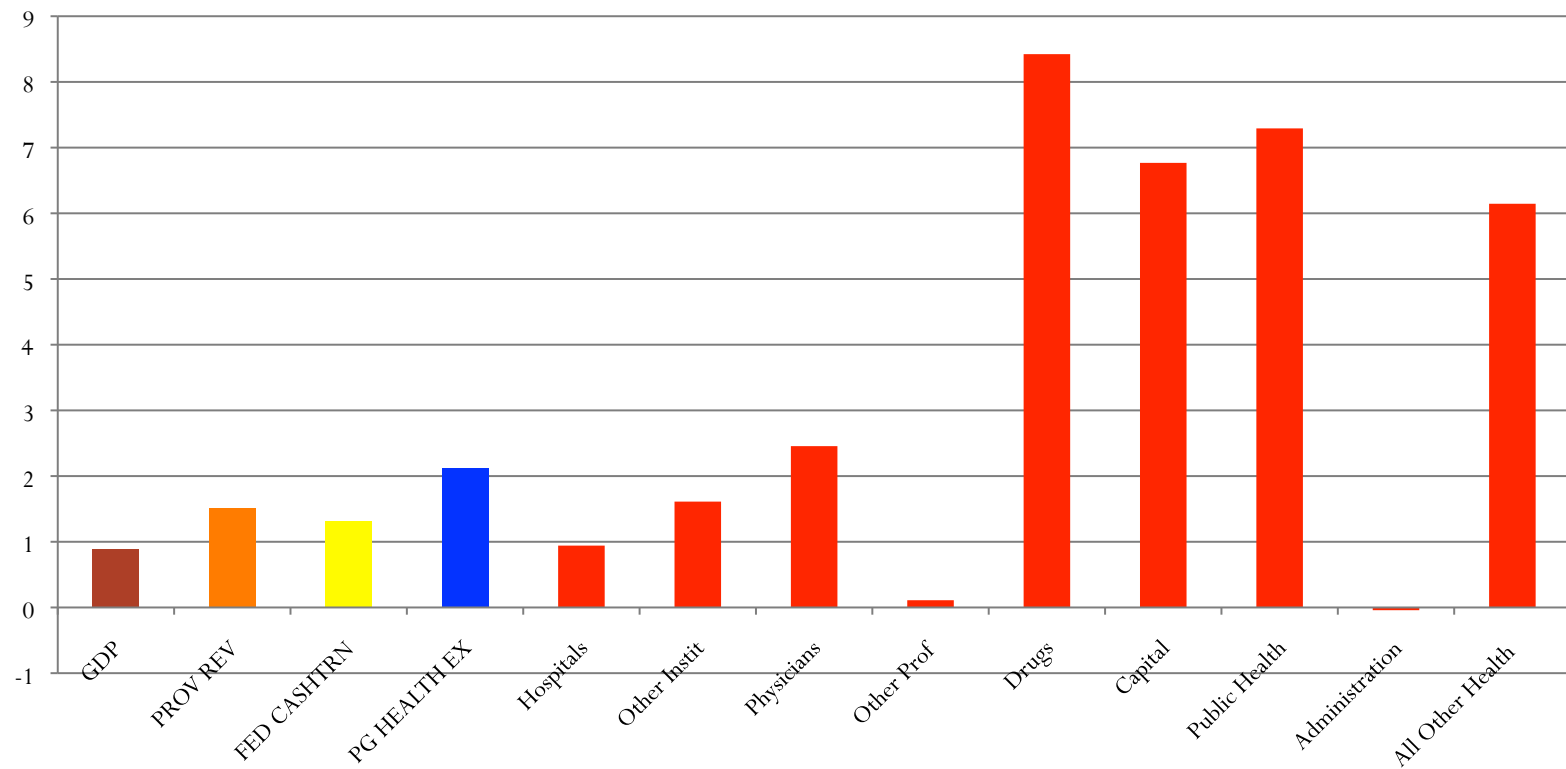
Average Annual Growth Rates for Resource Indicators & Government Health Expenditures for Canada's Provinces: 1976-2008



Results vary somewhat by province...

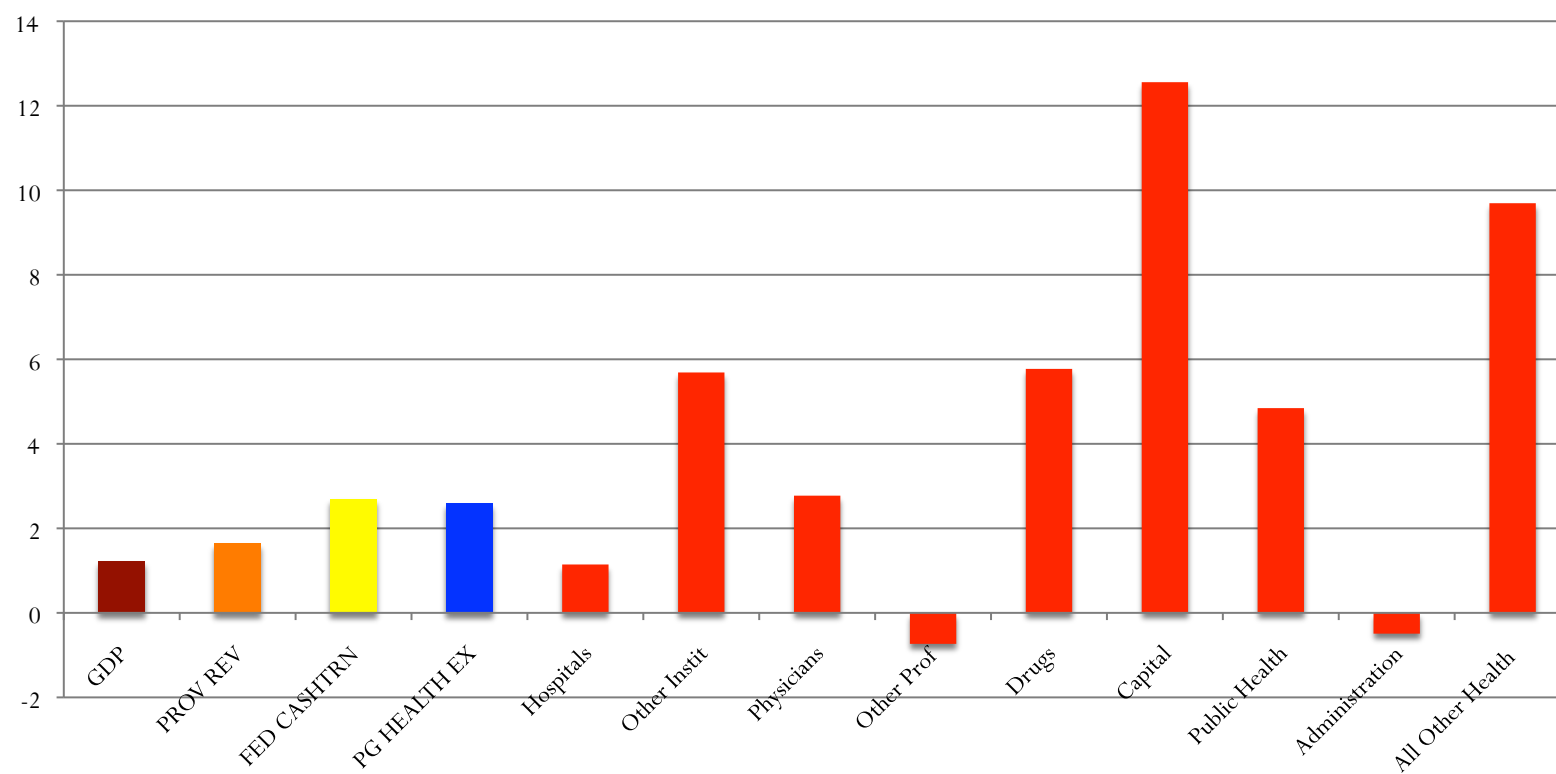
Ontario

Average Annual Growth Rate for Resource Indicators and Health Expenditures for Ontario: 1976-2008



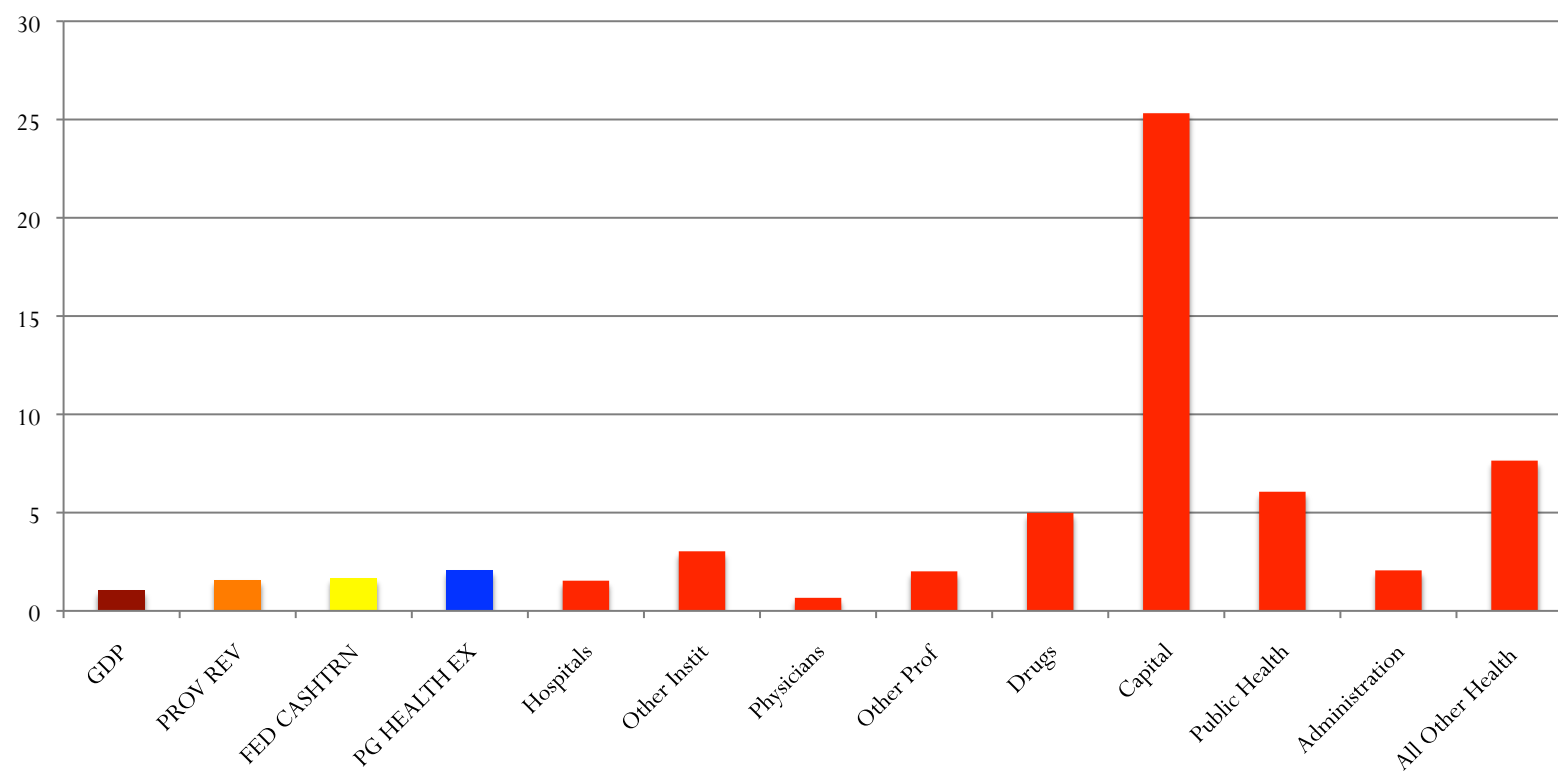
Saskatchewan

Average Annual Growth Rates for Resource Indicators and Health Expenditures: Saskatchewan, 1976-2008



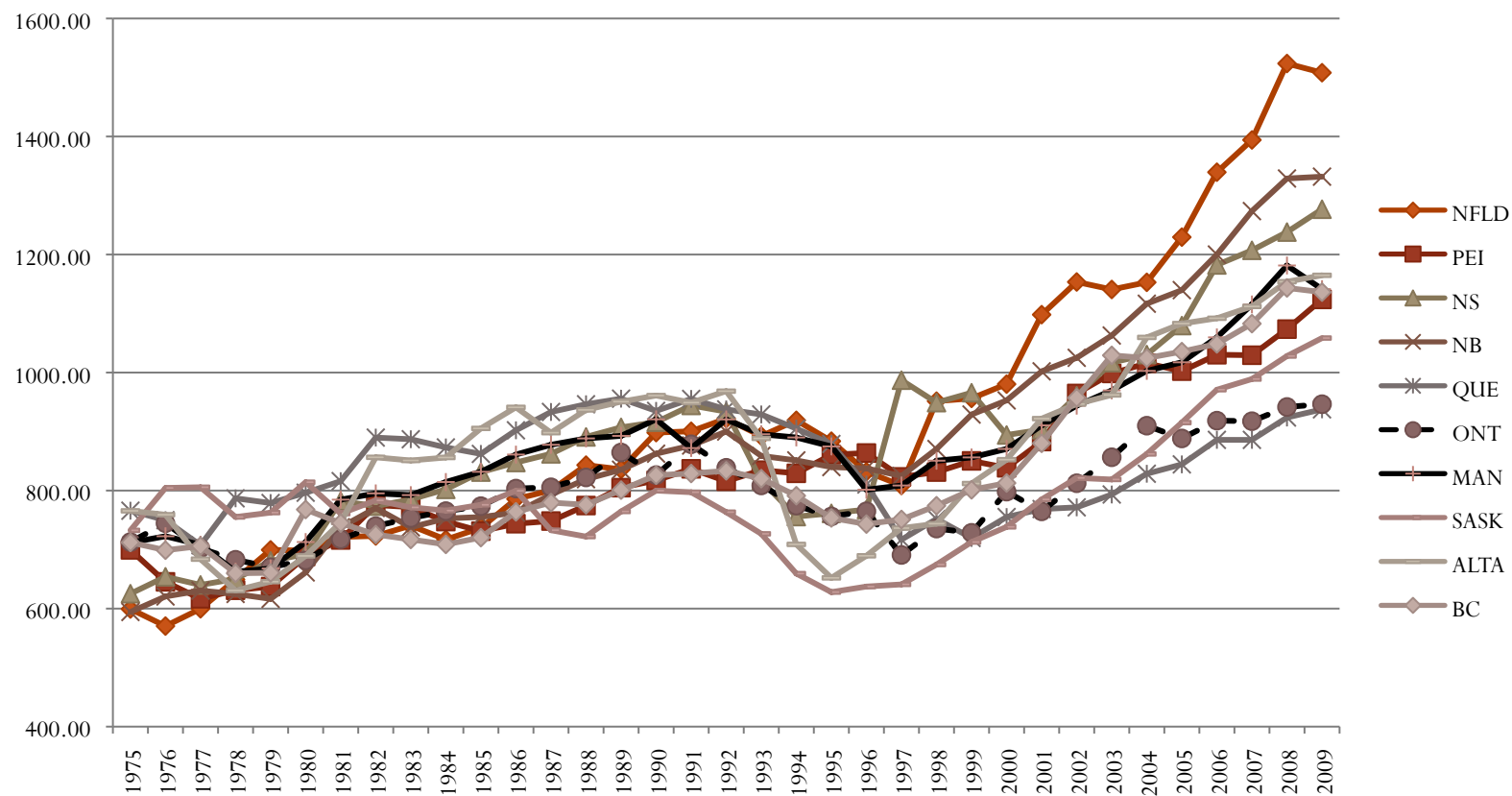
British Columbia

Average Annual Growth Rates for Resource Indicators and Health Expenditures: British Columbia, 1975-2008



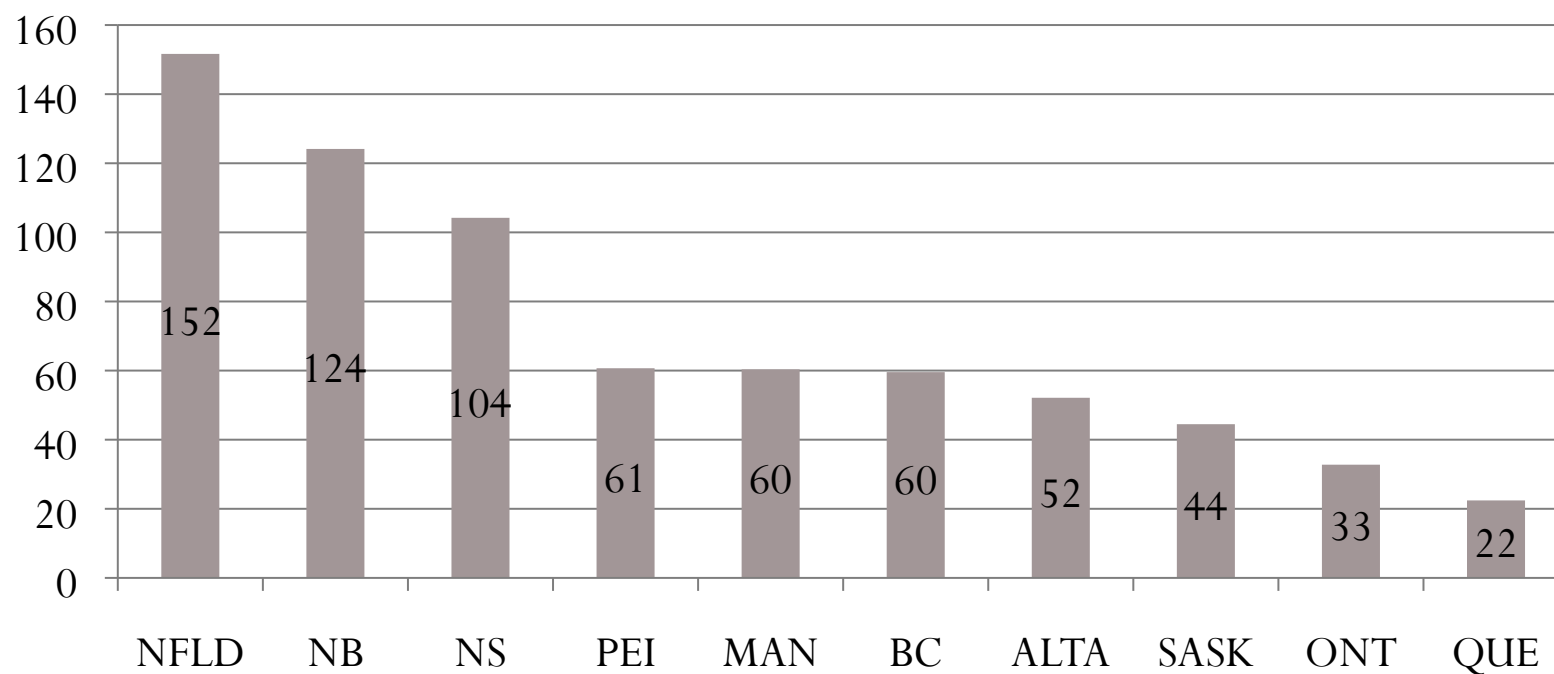
Hospitals

Real Per Capita Provincial Government Hospital Expenditure



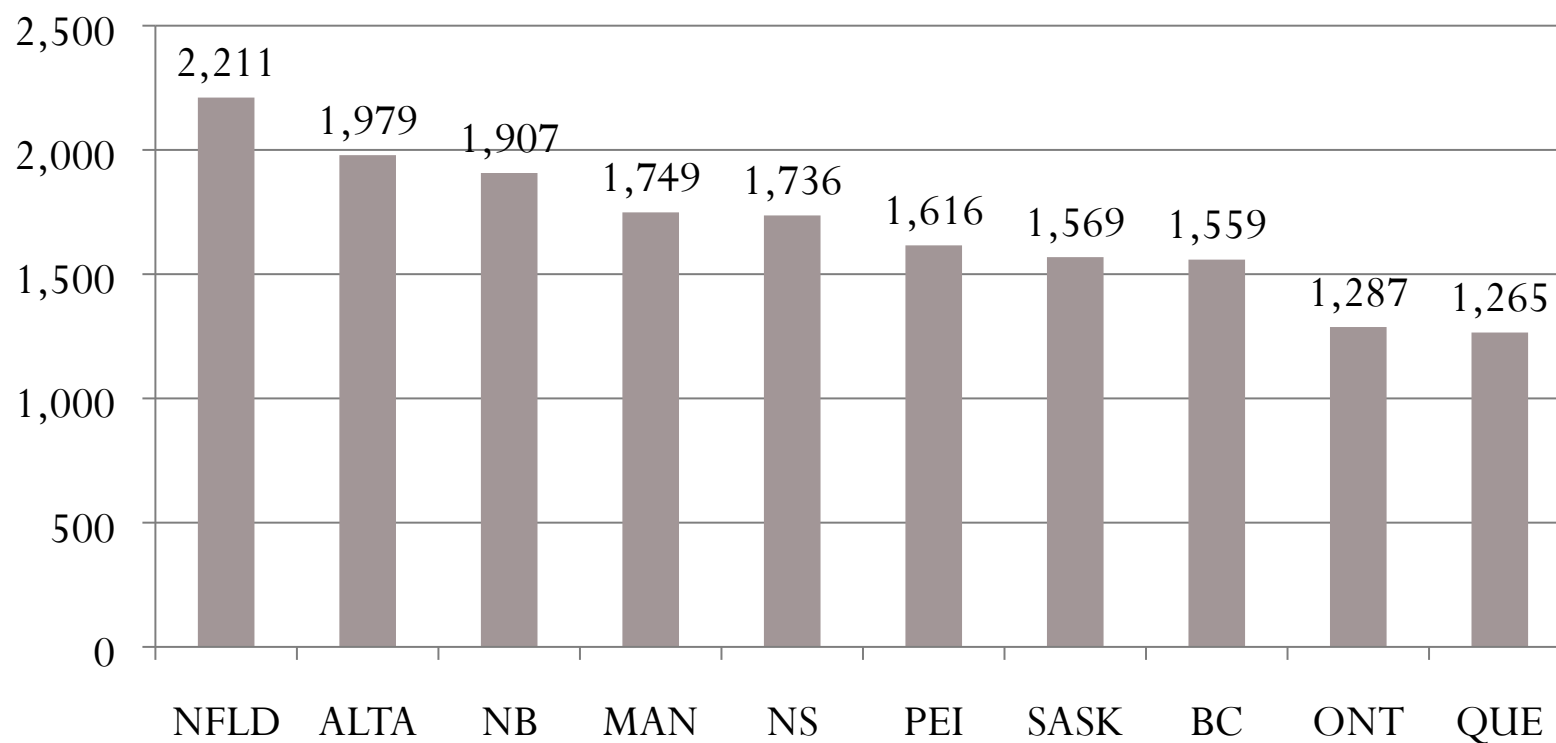
Hospital Growth

**Ranked Percent Growth in Real Per Capita
Provincial Government Hospital Expenditures:
1975-2009**



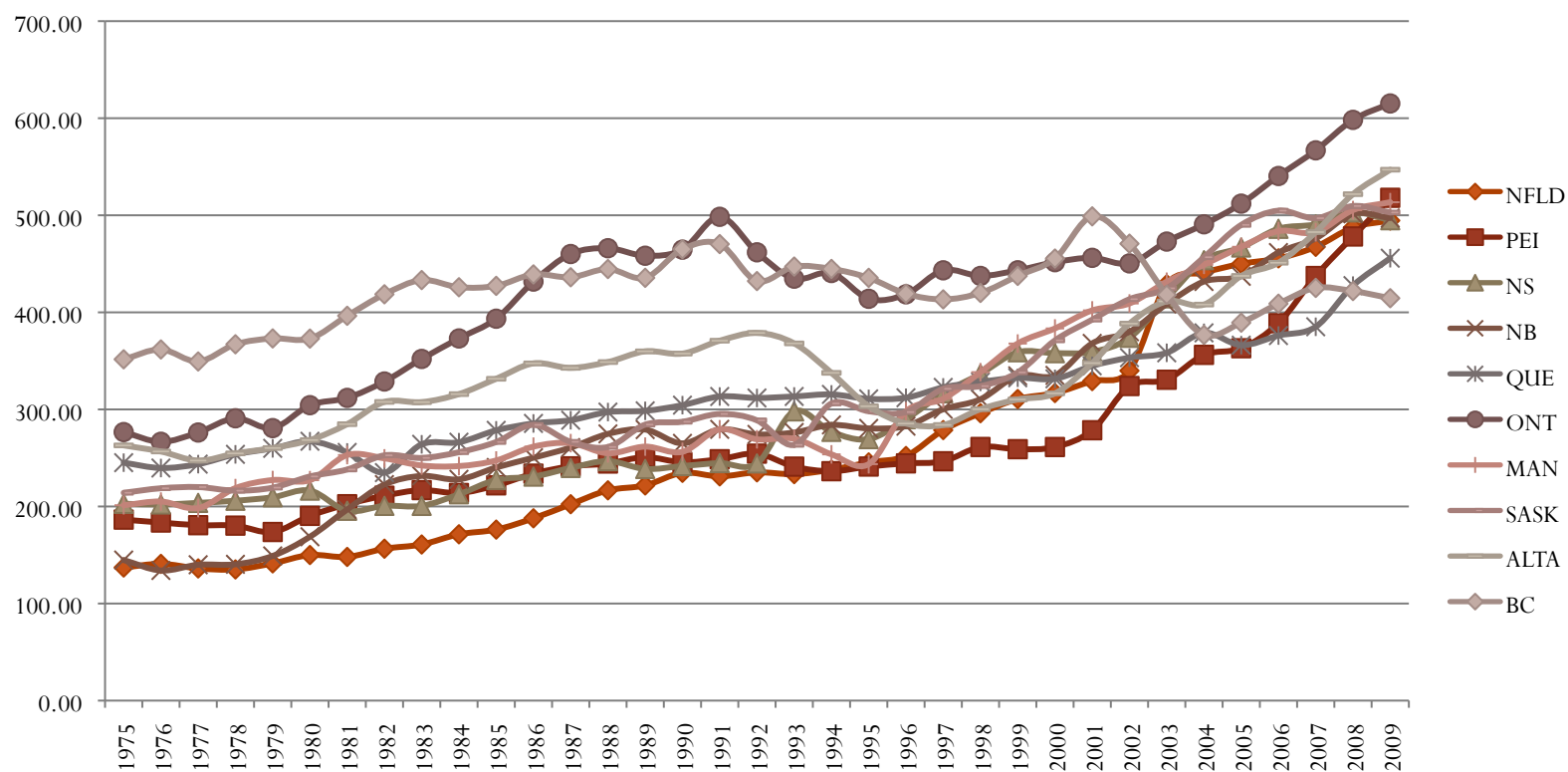
Ranked Hospital Spending

**Nominal Per Capita Provincial Government Hospital
Spending (\$): 2010**



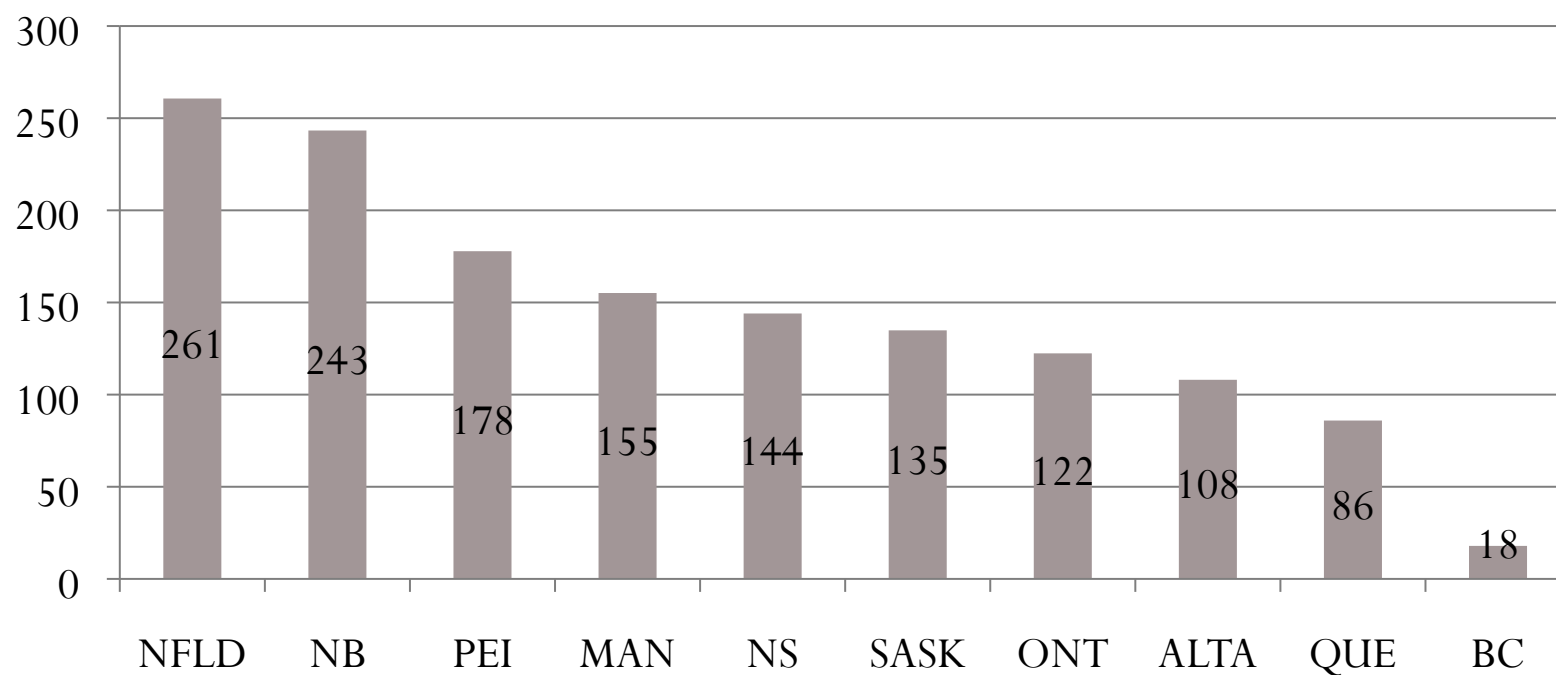
Physicians

**Real Per Capita Provincial Government Physician Spending:
1975-2009**



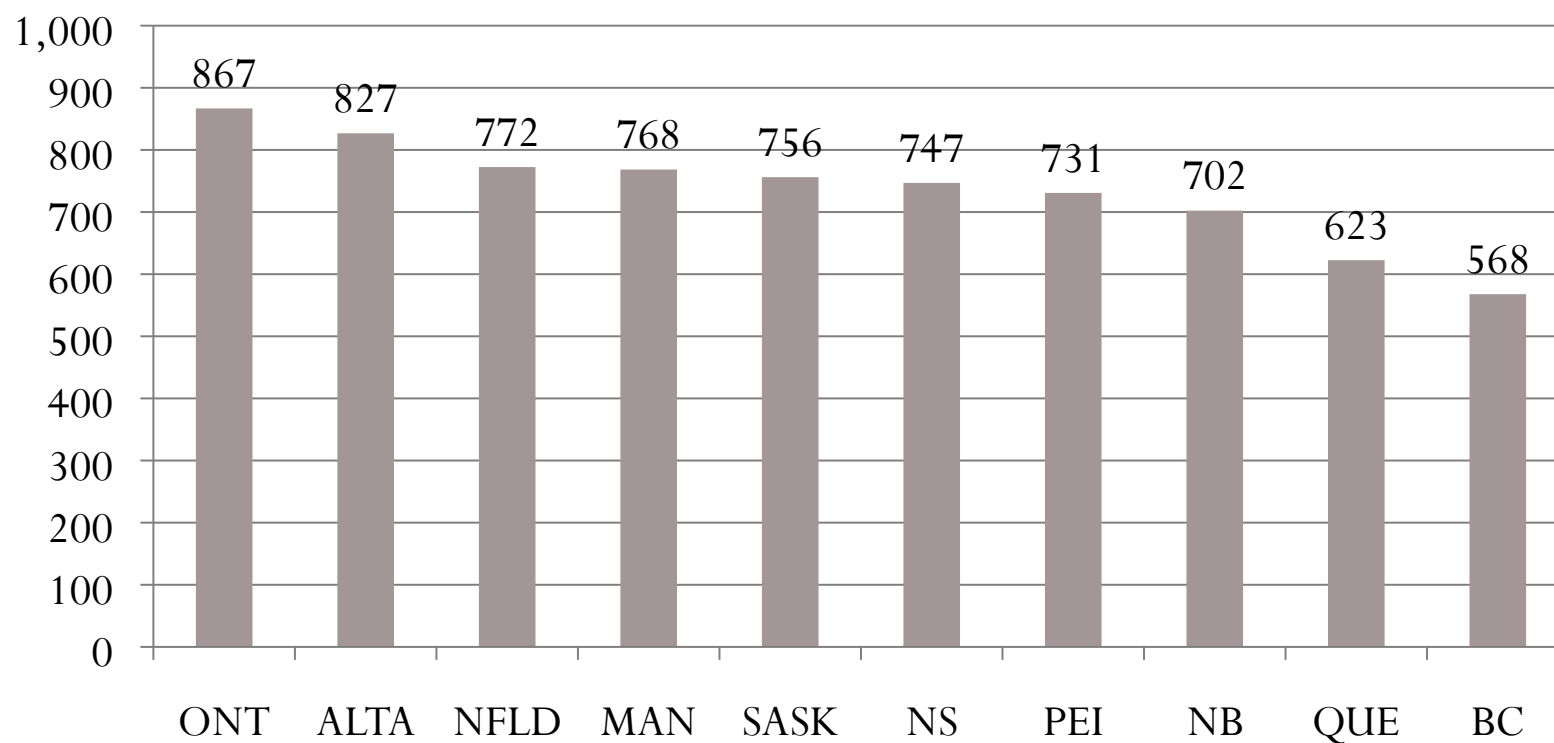
Physician Growth

**Ranked Percent Growth for Real Per Capita
Provincial Government Physician Expenditure:
1975-2009**



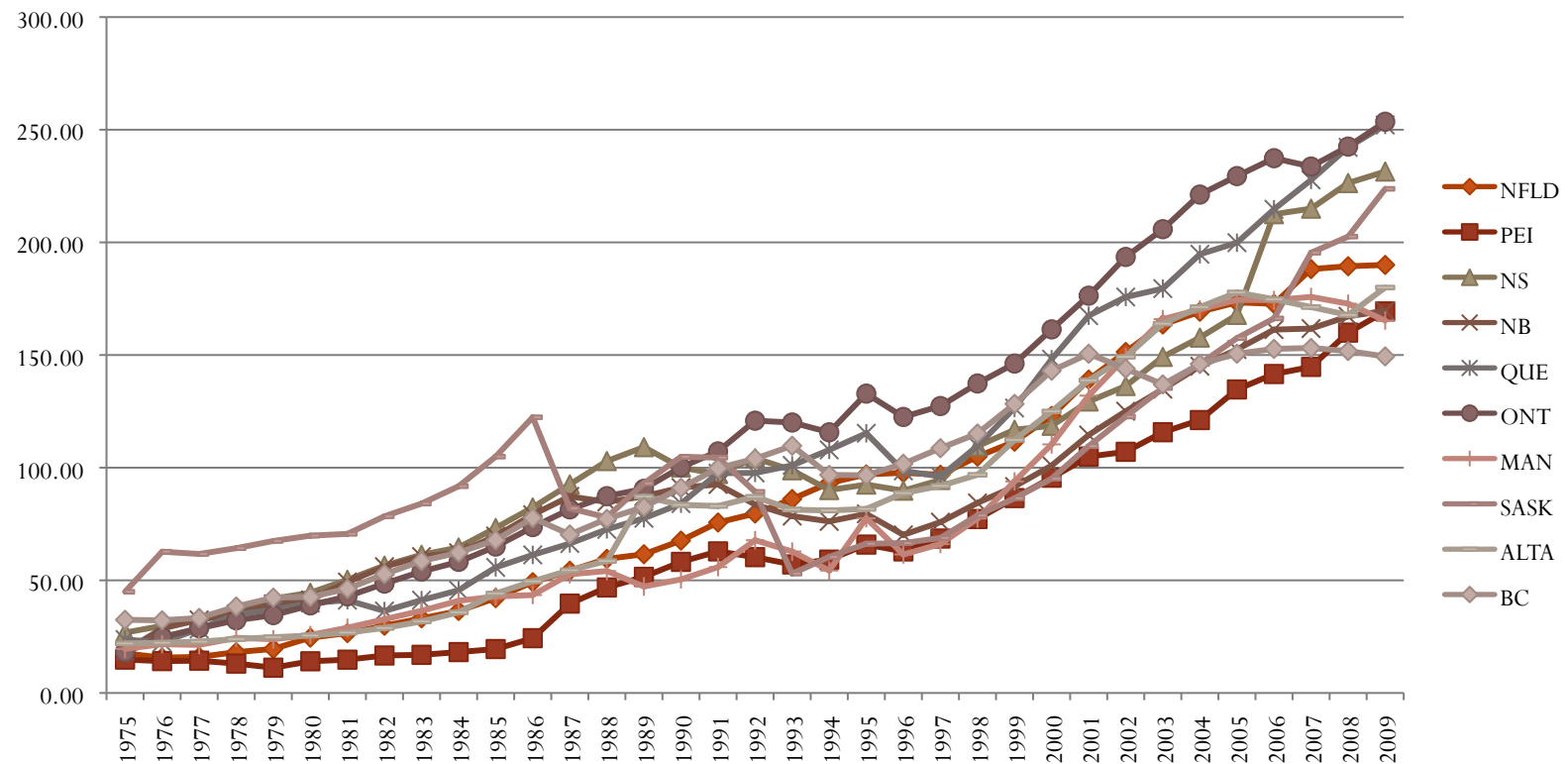
Ranked Physician Spending

**Nominal Per Capita Provincial Government
Physician Spending(\$): 2010**



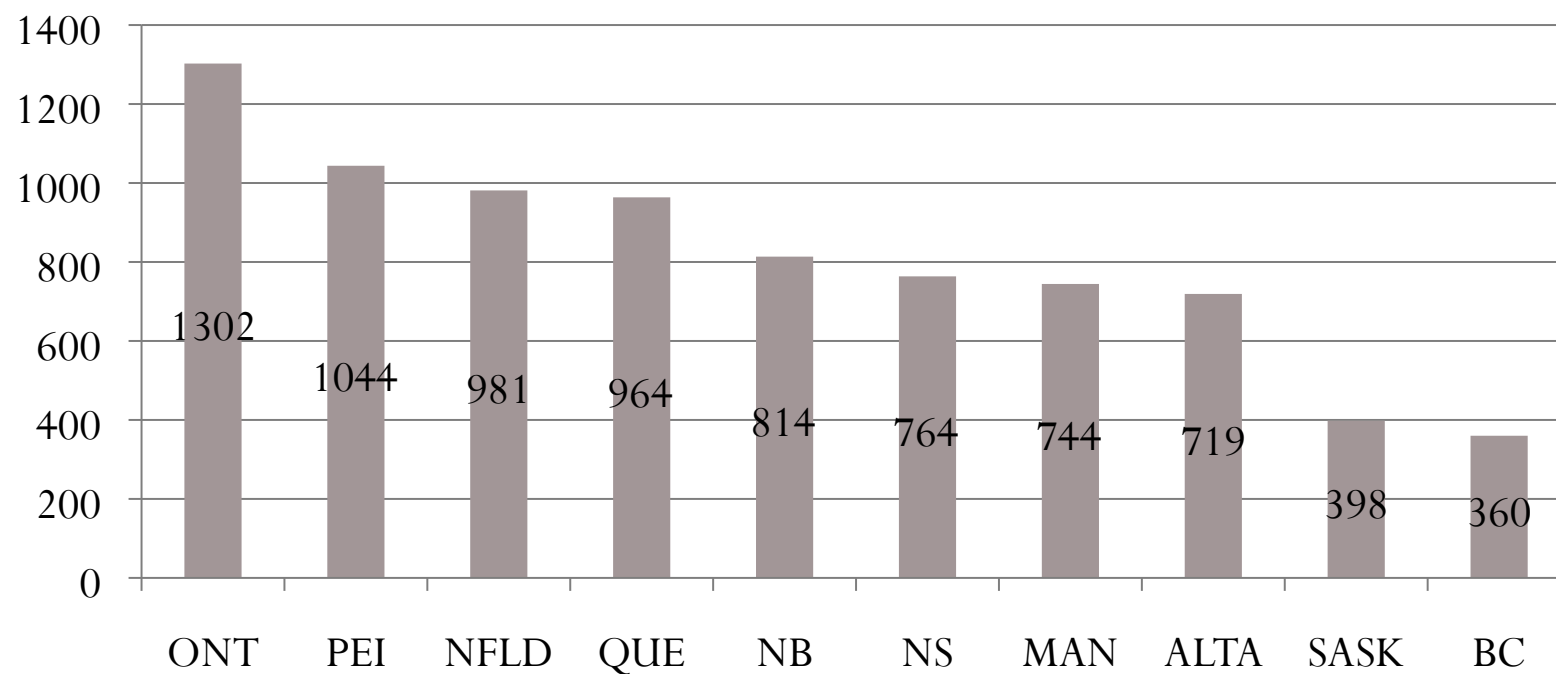
Drugs

**Real Per Capita Provincial Government Drug Expenditures:
1975-2009**



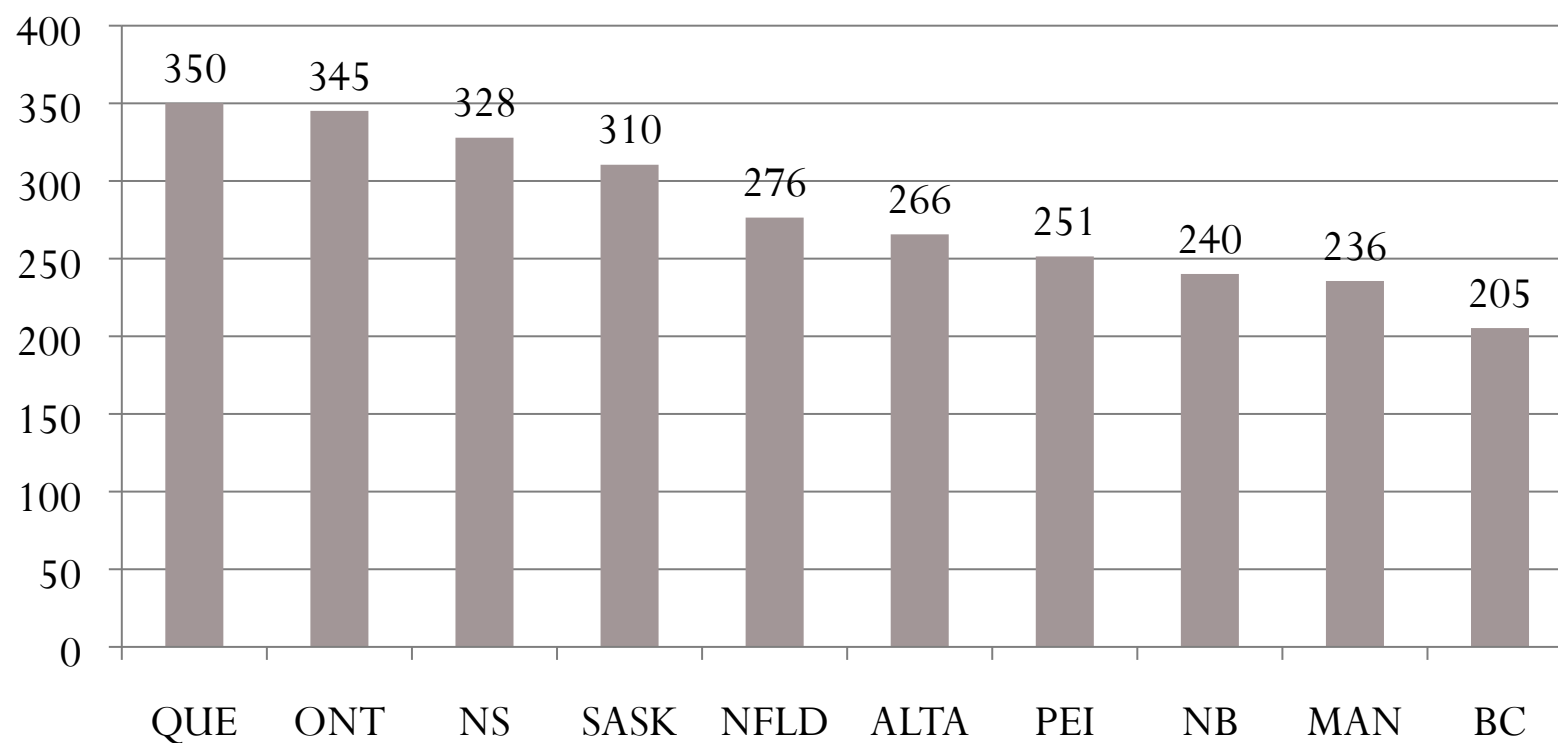
Drugs Growth

**Ranked Percent Growth for Real Per Capita
Provincial Government Drug Expenditures:
1975-2009**



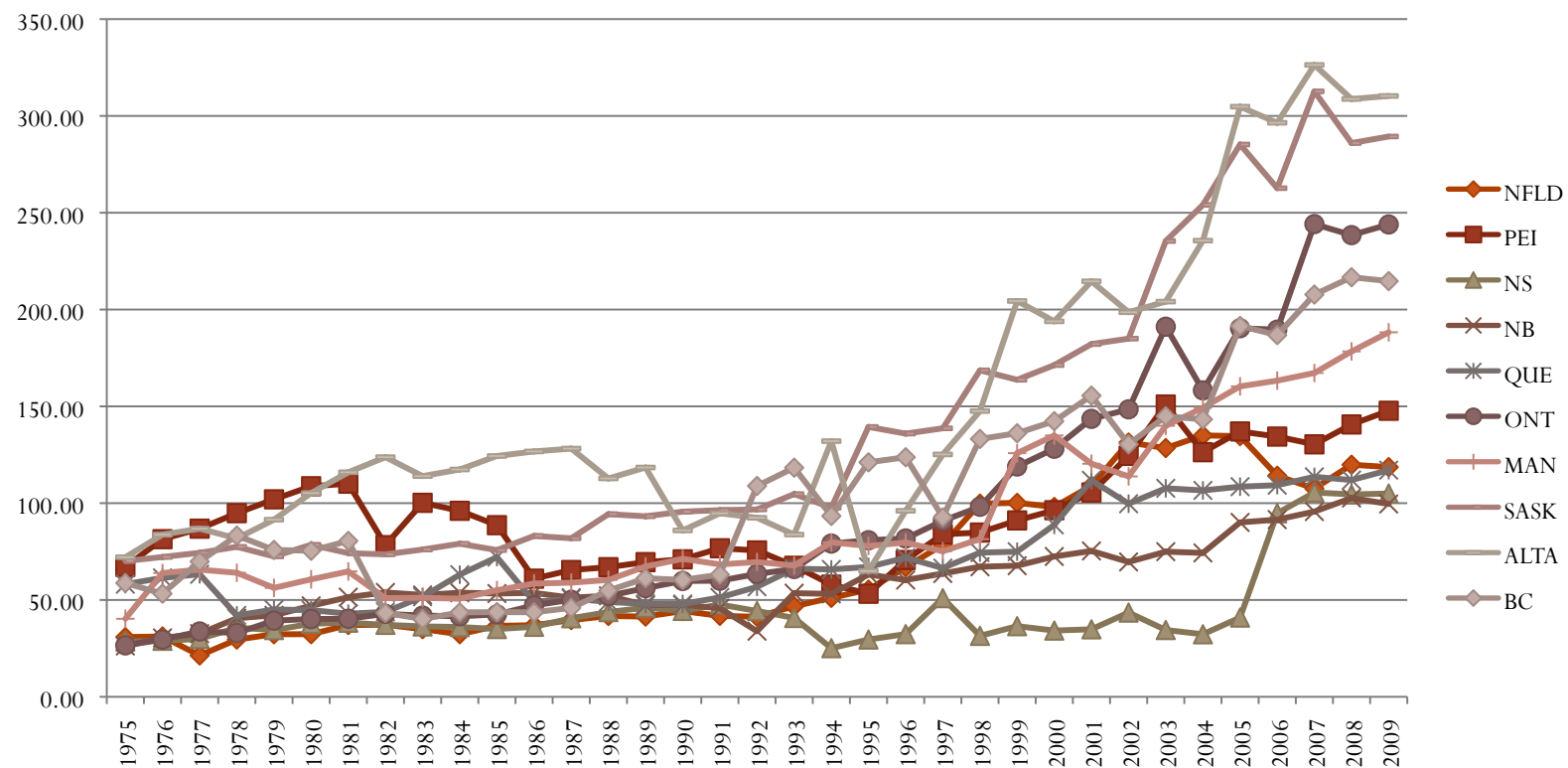
Ranked Drug Spending

**Nominal Per Capita Provincial Government Drug
Spending(\$): 2010**



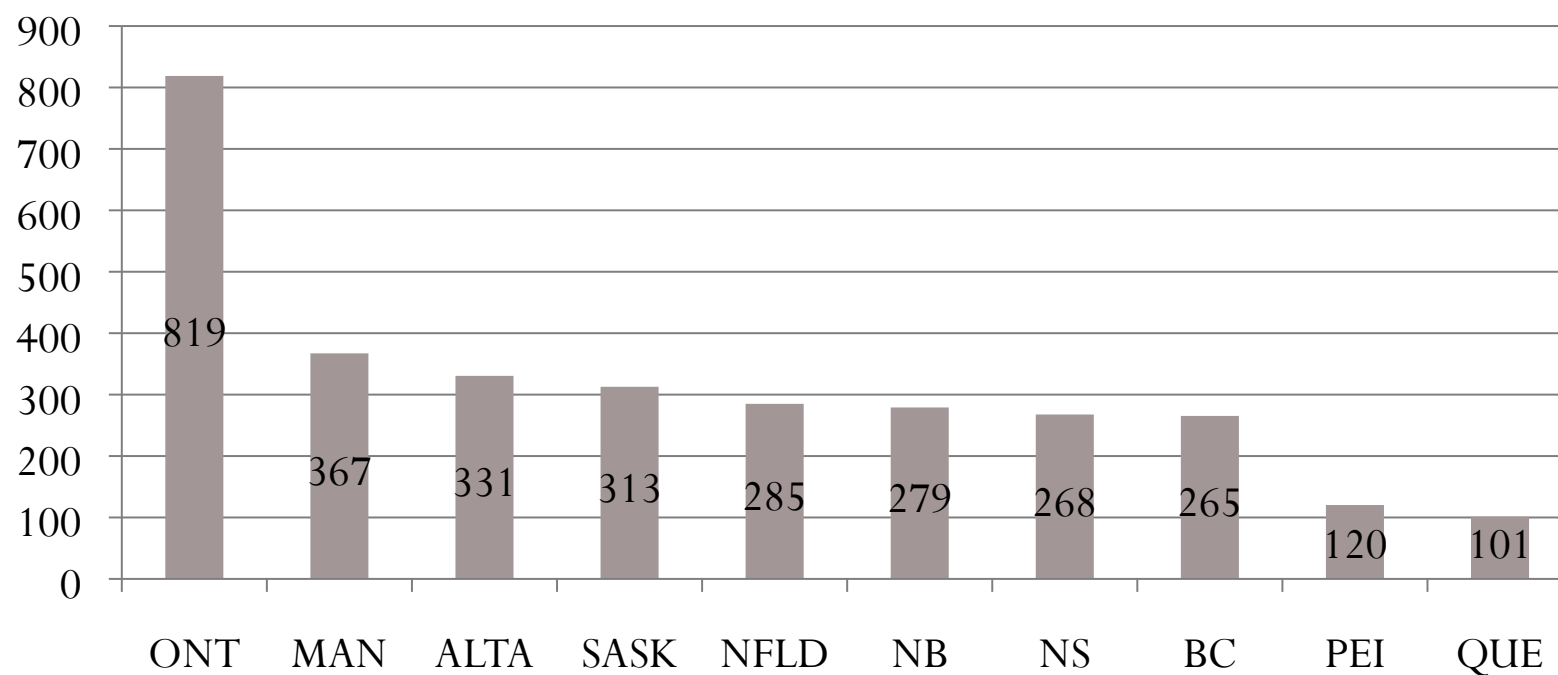
Public Health

**Real Per Capita Provincial Government Public Health
Expenditure: 1975-2009**



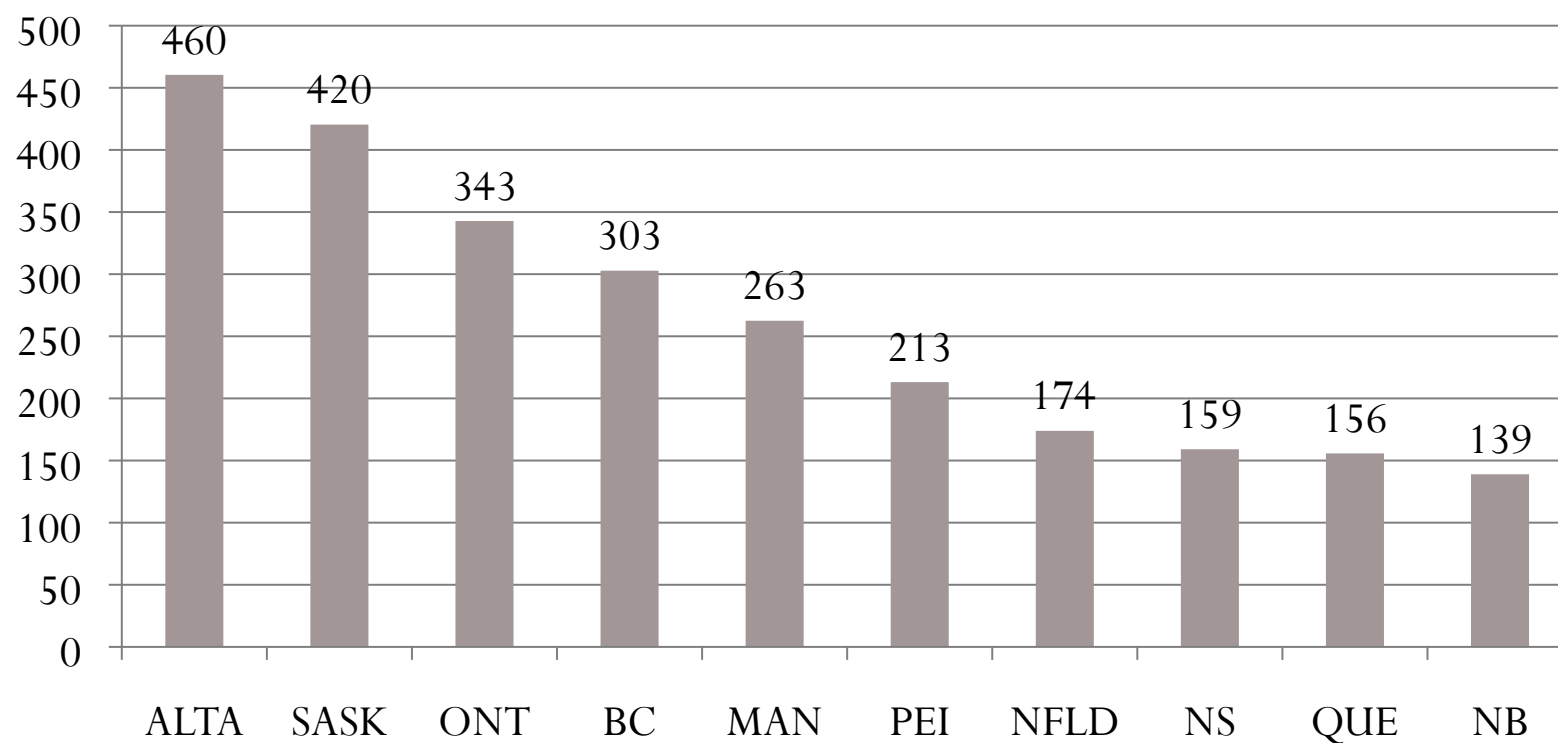
Public Health Growth

**Ranked Percent Growth for Real Per Capita
Provincial Government Public Health Expenditures:
1975-2009**



Ranked Public Health Spending

**Nominal Per Capita Provincial Government Public
Health Spending (\$): 2010**



Category approach

- Some health expenditure is more sustainable than others.
- Most sustainable: Hospitals, physicians, other health professionals, administration
- Least sustainable: other institutions, drugs, capital, public health, all other health
- Considerable diversity across provinces also with respect to categories:
 - Hospital spending growth highest in Atlantic, lowest in Ont & Que
 - Drug spending growth greatest in Ont & PEI, lowest-SASK, BC

What are the key drivers for health expenditure by category?

- Regression approach
- Pooled provincial times series and cross-sections
- $H_{it} = f(z_{it})$
- $H_{it} = a_0 + a_1 Z_{1t} + a_2 Z_{2t} + a_3 Z_{3t} + \dots a_n Z_{nt} + u_{it}$

Dependent Variables

- Rhltpgc
 - Real per capita provincial government health expenditures in 1997 dollars. Deflated using the Government Current Expenditure Implicit Price Index.
- By Categories:
 - rpg**hos**pc, rpg**oth**instc, rpg**phys**c, rpg**oth**prof**c**, rpg**drug**sc, rpg**capital**c, rpg**pub**hl**tc**, rpg**admin**c, rpg**oth**hh**tc**

Independent Variables

y	Real per capita provincial gross domestic product in 1997 dollars. Deflated using the Government Current Expenditure Implicit Price Index.
t	Real per capita federal cash transfers to the provinces. In 1997 dollars, deflated using the Government Current Expenditure Implicit Price Index.
nfld	1 if Newfoundland, 0 otherwise.
pei	1 if PEI, 0 otherwise
ns	1 if Nova Scotia, 0 otherwise.
nb	1 if New Brunswick, 0 otherwise.
que	1 if Quebec, 0 otherwise.
ont	1 if Ontario, 0 otherwise.
man	1 if Manitoba, 0 otherwise.
sask	1 if Saskatchewan, 0 otherwise.
alta	1 if Alberta, 0 otherwise.
bc	1 if British Columbia, 0 otherwise.
p65	Proportion of provincial population aged 65 or greater.
Pop	Provincial population.
yr	Year
epf	1 if Established Program Financing in effect (1977-1995), 0 otherwise.
cha	1 if Canada Health Act in effect (1984-2008), 0 otherwise.
chst	1 if Canada Health and Social Transfer in effect (1996-2004), 0 otherwise.
chtest	1 if separate Canada Health Transfer and Canada Social Transfer in effect (2005-2008), 0 otherwise.
*	Denotes interactive variable. (eg. y*nfld, y*pei, etc...)

Estimation Technique

- Linear model
- Generalized Least Squares
- Analytic weight (POP)
- Assumption of correlated error terms across provinces
- Within province error terms assumed to be AR1
- RHO type for AR correction: Durbin-Watson

Hospital Regression Results-I

Income and Transfers

	Coef.	Std. Err.	z
ynfld	0.0117216	0.0013888	8.44
ypei	0.0147176	0.007098	2.07
yns	0.0257848	0.0115302	2.24
ynb	-0.0027132	0.0039605	-0.69
yque	0.0017448	0.0059763	0.29
yont	0.004333	0.0024252	1.79
yman	0.0088747	0.0036257	2.45
ysask	0.0071189	0.0022947	3.1
yalta	0.0017673	0.0023643	0.75
ybc	0.008326	0.0025793	3.23
tnfld	0.0107727	0.005182	2.08
tpei	0.0264595	0.0198915	1.33
tns	0.0680493	0.0227647	2.99
tnb	0.0036426	0.0164668	0.22
tque	0.082762	0.0307931	2.69
tont	0.1005674	0.0298761	3.37
tman	-0.0035074	0.0196589	-0.18
tsask	-0.0108898	0.0148819	-0.73
talta	0.1807233	0.0596284	3.03
tbc	-0.0433206	0.0355153	-1.22

Proportion 65+ & Population

	Coef.	Std. Err.	z
p65nfld	-1884.034	935.4677	-2.01
p65pei	420.2574	1057.729	0.4
p65ns	1628.251	1656.718	0.98
p65nb	161.3528	795.1773	0.2
p65que	-652.8577	883.1947	-0.74
p65ont	981.9172	837.0693	1.17
p65man	-1252.739	595.9402	-2.1
p65sask	-147.7199	1146.268	-0.13
p65alta	-1912.858	2533.321	-0.76
p65bc	-38.18786	798.5147	-0.05
popnfld	0.0003577	0.0003645	0.98
poppei	-0.005836	0.0046525	-1.25
popns	0.0002112	0.0012323	0.17
popnb	-0.0021162	0.0004582	-4.62
popque	0.0002274	0.0001588	1.43
popont	0.000121	0.0000361	3.35
popman	0.001668	0.000485	3.44
popsask	-0.001297	0.0003615	-3.59
popalta	0.0002138	0.0002175	0.98
popbc	-0.0001513	0.00007	-2.16

Hospital Regression Results-II

Time Trend & Regime Dummies

	Coef.	Std. Err.	z
yrnfl	20.85261	2.254528	9.25
yrpei	15.35025	4.25887	3.6
yrns	-2.065768	9.271252	-0.22
yrnb	27.00503	2.604623	10.37
yrque	-3.540305	7.763806	-0.46
yront	-10.0559	5.644758	-1.78
yrman	4.965977	3.165826	1.57
yrsask	10.26073	2.697276	3.8
yralta	7.526293	11.91222	0.63
yrbc	19.53503	4.911756	3.98
epf	-21.49884	15.3625	-1.4
CHST	-100.1351	22.90387	-4.37
CHA	-2.782254	14.46354	-0.19
CHTCST	-101.7576	28.66869	-3.55
_cons	19270.39	10856.37	1.78

Constants

	Coef.	Std. Err.	z
nfl	-60157.44	11408.61	-5.27
pei	-48634.11	13264.64	-3.67
ns	-15388.16	20464.61	-0.75
nb	-70593.78	11734.37	-6.02
que	-13016.63	14259.01	-0.91
man	-30163.07	11779.63	-2.56
sask	-37775.67	11632.45	-3.25
alta	-33970.63	26006.93	-1.31
bc	-57016.92	14500.01	-3.93
_cons	19270.39	10856.37	1.78

Summary of Significant Regression Coefficients (5% level)

	Hospitals	Other Institutions	Physicians	Other Professionals	Drugs	Capital	Public Health	Administration	All Other Health
Income	6(+)	2(+); 1(-)	4(+)	2(+); 1(-)	4(+)	2(+)	1(-)	1(-)	3(+)
Federal Transfers	5(+)	1(+); 2(-)	1(+)	1(-); 1(+)	2(+); 1(-)	2(+)	3(+); 1(-)	2(+); 1(-)	1(+); 1(-)
Proportion>Age 65	2(-)	1(+)	1(+); 2(-)		1(+); 2(-)	1(+)	1(+); 2(-)	1(+)	2(+); 1(-)
Population	3(-); 2(+)	1(+); 6(-)	7(-); 1(+)	2(+); 1(-)	2(+); 4(-)	2(+); 1(-)	2(-); 2(+)	1(+); 1(-)	5(-); 1(+)
Time Trend	5(+)	7(+)	8(+)	3(-); 1(+)	7(+)	1(+); 1(-)	3(+); 1(-)	4(+); 1(-)	8(+)
epf		(+)	(-)	(+)	(-)	(-)			
CHST	(-)		(-)		(-)	(-)			
CHA				(+)	(-)		(-)		
CHTCST	(-)	(-)					(+)		
Constants	6(-)	7(-)	2(+)	1(-); 1(+)	5(-)	1(+); 1(-)	1(-)	6(-)	2(-)
% Significant coeff	48%	47%	44%	25%	48%	22%	30%	31%	38%

Overall Sustainability Drivers

- Time trend a major and significant positive influence for per capita Other Institutions, Physicians, Drugs, All Other Health. *Is time trend policy? Technological extension?*
- Per capita income and federal transfers major positive driver for per capita Hospital spending. *Will slower economic growth automatically translate into less spending?*
- Total population size a major driver for per capita physician spending (negative). *Do growing populations provide economies of scale for physician services?*
- Aging is not that important a driver...yet. *Is there a better way to model aging?*

Is Provincial Government Health Spending Sustainable?

- It depends...on:
 - Economic growth and its effect on per capita GDP and transfer payments
 - Policy responses to cost increases
 - Technological extension
 - What province you live in:
 - Most sustainable: Ont, BC, Que
 - Least sustainable: Nfld, NB, NS
 - What category of health spending you are looking at:
 - Most sustainable: Hospitals, Physicians, Other Prof
 - Least sustainable: All other Health, Capital Drugs

But, Some Caveats...

- Age variable Prop65+ not significant but this may not take into account ‘cost of dying’ and demographic shift of population surviving into their 80s and 90s.
- Physician spending: may be about to soar. The 2009 CIHI Report on Supply, Distribution and Migration of Physicians notes record number of physicians graduating in 2009 – increase of 34% over 2004.
- More physicians practicing means more spending – all other things given. Sustainability impact

Questions?