Common Determinants and Cost-Drivers of Provincial Government Health Expenditures

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Outline

- This study examines the determinants and drivers of provincial government health spending.
- Recent trends in government health expenditure are briefly reviewed to establish context for the issue.
- Estimates of the determinants of health expenditure by category are made using regression analysis to provide insight on expenditure drivers,
- A policy analysis of what it will take to bend the cost curve.

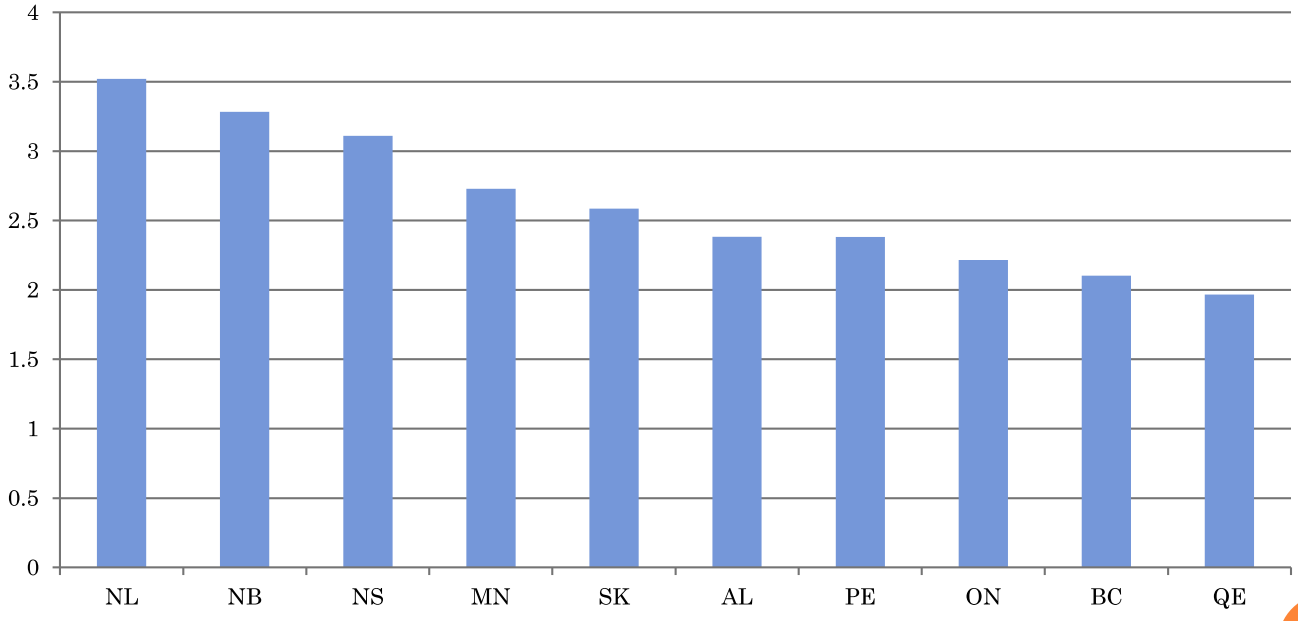
Summary

- Regression analysis reveals diversity across expenditure categories in terms of the key determinants and drivers of real per capita provincial government spending.
- For example, when it comes to an aging population, increases in physician spending are driven especially by the proportion of population aged 70 to 74 and 85 plus. Hospital spending on the other hand declines with respect to the population share aged 75 to 79 and 85 years plus.
- Ultimately, many of these determinants and cost drivers are linked to the price of health care services and bending the cost curve will require strategies to shift to lower cost inputs.

Trends

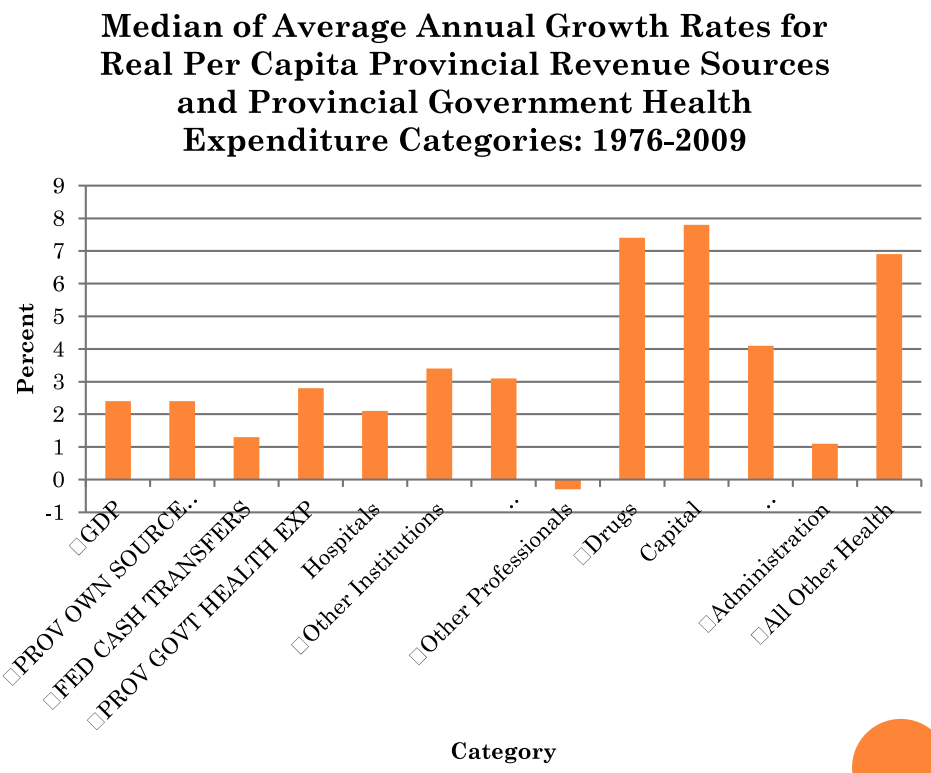
- In 1975, average real per capita provincial government health expenditure (in 1997 dollars) was $1,149 and reached $2,718 by 2009.
- Growth rates highest in the Atlantic provinces of Newfoundland and Labrador, New Brunswick and Nova Scotia at over 3 percent. They are lowest in Ontario, British Columbia and Quebec.

Average Annual Growth Rate (%) of Real Per Capita Provincial Government Health Expenditure: 1975-2009



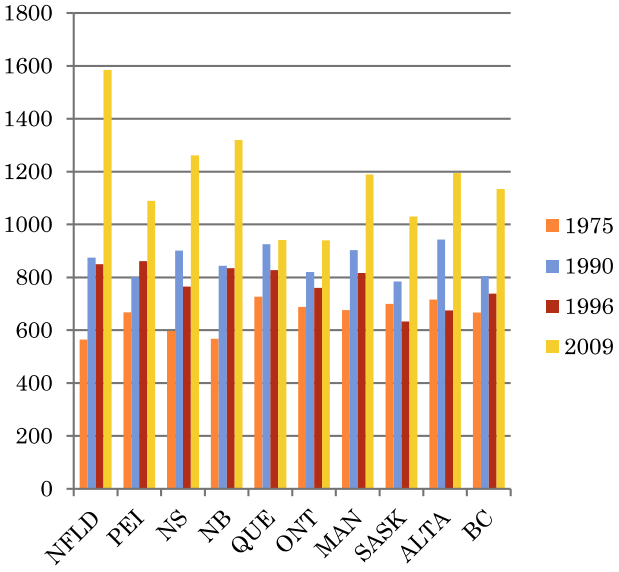
By Category

- Some categories of provincial government health spending are keeping pace with resource and revenue growth while others are not

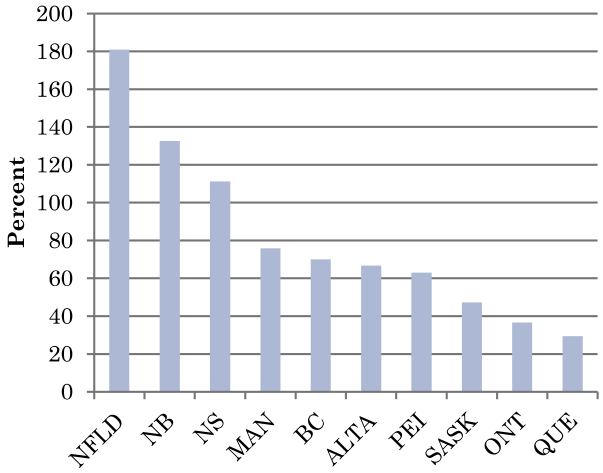


CATEGORIES ALSO VARY ACROSS PROVINCES

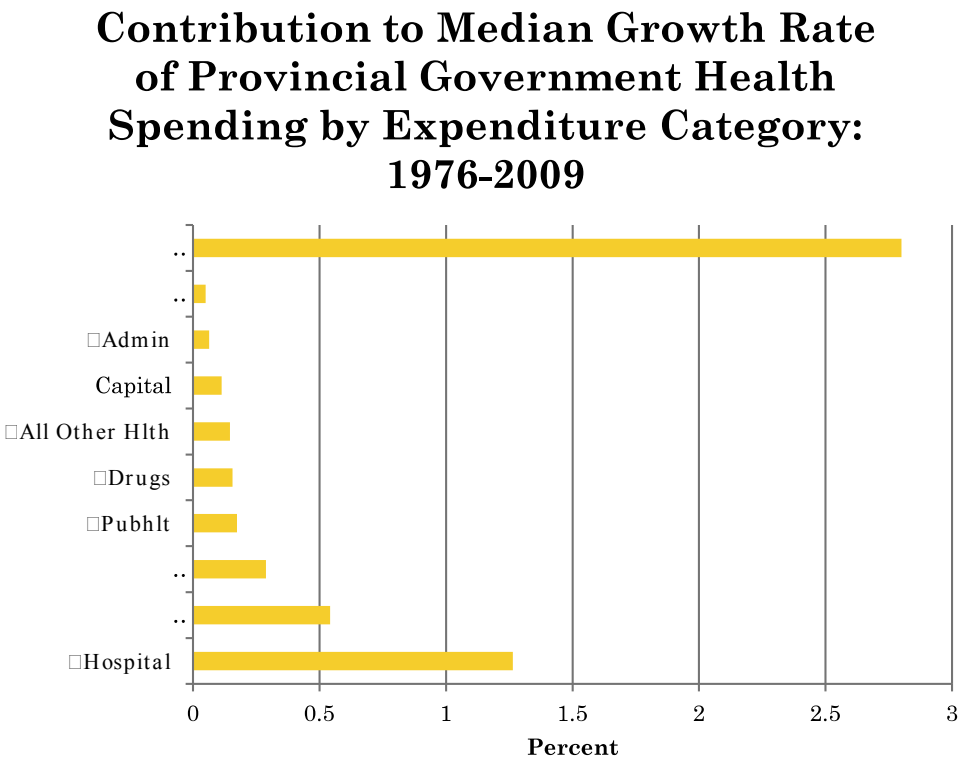
Real Per Capita Provincial Government Hospital Expenditure 1975-2009 (1997 dollars)



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

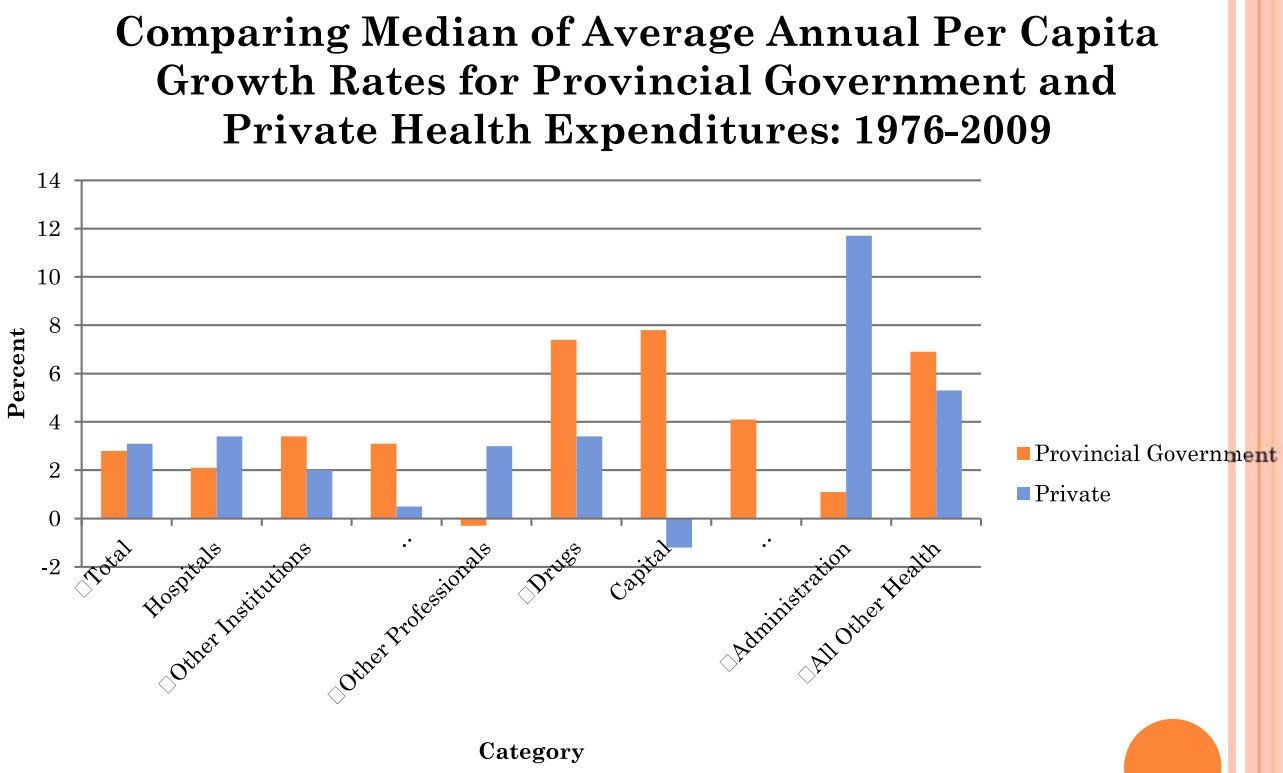


Hospitals & Physicians still big contributors



- Over the period 1975-2009, hospitals on average contributed 1.17 out of the 2.8 percentage points of annual median growth in total provincial government health spending with physicians next at 0.5 percentage points.

Another Comparison



Need to Understand Cost Drivers

- How much of the provincial variations in health care spending are due to differences across provinces in demographic and environmental factors?
- How much is due to the different approaches of the provinces to health-care systems when it comes to providing and managing care?
- Understanding these drivers of health expenditure categories is ultimately a necessary component of understanding health care sustainability and bending the cost curve.

The Model

- A pooled time-series cross-section regression model is estimated:

$$(1)\ H_{it} = f(z_{1it}, z_{2it}, \ldots . z_{nit})$$

- where H_{it} is real per capita government health expenditures of the i-th province at period t;
- and z_1 to z_n represent a vector of social, demographic, economic and policy variables of the i-th province/territory at time t

Data

- National Health Expenditure database constructed by the Canadian Institute for Health Information
- CANSIM-Statistics Canada
- Federal Fiscal Reference Tables

Independent Variables

- real per capita GDP, population
- time trend
- the proportion of population aged 65 to 69 years, 70 to 74 years, 75 to 79 years, 80 to 84 years and the proportion aged 85 years
- Real per capita provincial government own source revenue
- real per capita federal cash transfers
- real per capita provincial debt interest
- Private share of health spending; transfer regime dummies; provincial dummies

Results

- Key significant determinants (at the 5% level) of real per capita provincial government health expenditures and across the health categories include:
  - real per capita GDP,
  - time trend, provincial dummies
  - proportions of population aged 65 years and over,
  - total physicians per 10,000 population,
  - private share of total health spending
  - provincial debt interest and revenue variables.

Some Particular Points

- real per capita GDP, federal transfers and own source provincial government revenues are generally positive and significant
- The number of physicians per 10,000 of population is a positive and significant determinant for hospital, physician and administrative spending
- Physician spending driven by proportion of population aged 70 to 74 and 85 plus; hospital spending declines with respect to the population aged 75 to 79 and 85 years plus.
- Drug spending is positively and significantly related to the share of population under age of 75
- Provincial fixed effects, all other things given, most provinces spend less than Ontario when it comes to real per capita total health spending, hospitals, administration and physicians
- Population negative & significant-economies of scale?

Analysis & Discussion

Implications of Results

- there are a number of significant drivers of provincial government health spending of which several can be viewed as cost-side variables with implications for bending the cost curve:
  - effect of physician numbers on administrative costs. What can be done to administer physician services in a more cost-effective manner?
  - Population. What can be done particularly in smaller jurisdictions to generate the economies of scale?
  - Aging and institutional care. What can be done in the area of other institutional care to deal with the impact of an aging population?

Other Drivers May Be More Significant with Implications for Bending the Cost Curve

- Impact of time trend could be capturing not only the impact of technological change but also rising costs in the health care sector
- Differences across provinces in real per capita spending could be capturing differences in costs and compensation levels from regional labour markets as well as institutional differences or entrenched historical patterns of spending.

PUTTING IT ALL TOGETHER… “the fifth way” for sustainability

From Raisa Deber (2010)
"There are only 4 ways to contain costs"

1. Increase the efficiency of health care delivery
2. Increase the administrative controls on the use of these services
3. Limit the resources available through the health care system.
4. Increase the financial incentives for patients to limit their use of medical services

- In Canada, we attempted 1, did 2 and 3, and have mostly avoided 4
- What should we do next?
  - Something else….

THINKING ABOUT THE HEALTH CARE SYSTEM NEEDS TO CHANGE

- COSTS (or EXPENDITURES) = P*Q
- Productivity gains in medical care (more Q) have been enormous and this has caused "problems"
  - People expect a lot and meeting those expectations is expensive
  - Technology is a problem since it increases service volumes by adding to what we can do
    - Can we "afford" innovation in health care?
- In Canada, all discussions are around "quantities of services" (Q)
    - Wait lists, numbers of doctors, rationing etc…
  - We act as if prices for services are "fixed", non-negotiable and only rising
- We never talk about prices (P) and how they could adjust with productivity gains
  - If prices can adjust then we can afford to lots of things we need to

Exhibit 1:
Raisa Deber (2010,13)

- "the task of maintaining efficiency and affordability in the face of medical technology is seen as a major challenge… Most countries have recognized that whilst advancing technology has considerable potential to improve health outcomes and economic efficiency, it is also a major driver of increased costs. Policies to address this dilemma include methods for approval and pricing of new drugs and health technology assessment."

HOW DID TECHNOLOGICAL CHANGE AND INNOVATION BECOME A PROBLEM INSTEAD OF A SOLUTION FOR HEALTH CARE?

- **Innovation, new technologies bring benefits but seem to only increase costs.**
  - Blame is put on patents, monopolization, secret deals, clinicians etc…
  - Aspersions cast that most new innovations, often drugs, are useless, or add nothing to what we can do – "me too" drugs
  - **medical technology firms profit at the expense of payers providing services of little health benefit.**
    - "There is extensive evidence of the provision of questionable or simply inappropriate services, old and new, at unnecessarily high cost. " Evans (2003, 20-21)
- **Efficiency and cost containment objectives best served by restraining new adoptions**

Canada lags other developed countries in terms of adopting new drugs, devices and technologies

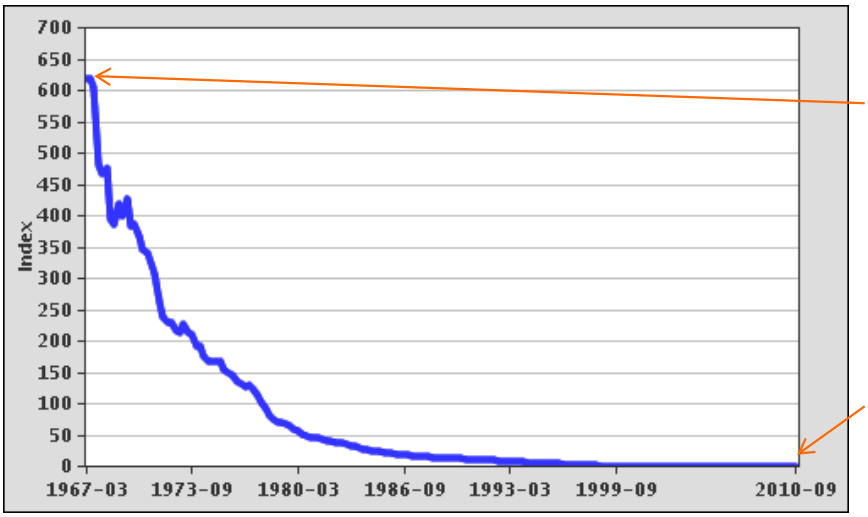
- Fraser Institute shows Canada a laggard in terms of new technologies and drug approvals.
- Manns, Clement et al. (JAMA 2009) show Canada less likely to approve drugs than Australia and UK.
- Is this a "problem" of Canadian Medicare or a "solution" for it's "cost problem"?
  - Fraser Institute – it is a problem
    - sticking with less effective, more costly older technologies
  - Not the Fraser Institute – No, it's the solution
    - most of the new drugs and technologies offer little benefit.
      - Widely misapplied, unnecessary –
        - e.g. MRI's over-utilized and lower tech alternatives are available.

In all industries, settings, sectors other than health, technical change and innovation have solved cost pressures

- **Market demand dictates the price of the technology and the extent of diffusion**
  - Technologies come in relatively crude and expensive for what they can do.
    - Over time, refinement enhances performance and lowers cost of the technology/device
  - Not all technologies make it, some don't survive but we don't try to pick the winner a priori.
- **In health care in Canada, there is no effective competition or market diffusion effect in the same way.**
  - We buy in at the high introductory price and keep paying it despite productivity gains
  - Productivity gains do not provide benefit to the public payer in terms of lower prices.
- **new technologies would normally result in old devices and technologies becoming obsolete and decommissioned.**
  - This does not necessarily happen in health where new technology adds another thing to do rather than replacing an older less effective thing with a new and more effective thing.
    - E.g. when typewriters deskilled (or different skilled) clerical work, we did not carry on with high paid males in those jobs. There was a wholesale substitution into lower cost female labour with consequent dramatic increases in output.

In 1970, should we have restrained adoption and use of computers?

Computer costs are 1/1000 today of what they were in 1970



BEA Price Index: Computers / Peripherals

http://www.frbsf.org/csip/data/charts/chart28.cfm

If technology and innovation are to be part of the solution…

- How we price <u>services</u> using the technology needs to change
  - Productivity gains in health care need to result in lower costs or more services for the same budget
    - Prices of services need to adjust with productivity
  - The price of the machine embodying the technology of second order importance!
- When services diffuse to patients with lower needs, price of services should fall
  - Like with laser eye surgery