What Is Bending the Cost Curve? An Exploration of Possible Drivers and Unintended Consequences

Qu'est-ce qui fait fléchir la courbe des coûts? Exploration des incitateurs possibles et des effets non-intentionnels

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Abstract

Health expenditures in most OECD countries have increased at a slower rate since 2008/2009. Potential drivers of this bending of the cost curve include: (1) changes in pharmaceuticals and technology innovations; (2) healthcare reforms, and specifically those focusing on care for complex and high-user patients and (3) government expenditure controls resulting from general economic conditions. We use publicly available National Health Expenditure data from the Canadian Institute for Health Information to assess the merits of each of these drivers, with a focus on British Columbia. We find some evidence for the effects of changes in pharmaceuticals and technology, but the dominant effect is government spending controls, which are greatest for non-Medicare-covered services. These changes suggest potential unintended consequences on access and equity that should be understood before declaring victory for healthcare expenditure control.

Résumé

Dans la plupart des pays de l'OCDE, on observe un ralentissement du taux d'augmentation des dépenses de santé depuis 2008–2009. Les incitateurs potentiels de ce fléchissement de la courbe des coûts incluent : 1) les changements pharmaceutiques et les innovations technologiques; 2) les réformes des services de santé, particulièrement celles qui portent sur les soins pour les états de santé complexes et celles qui visent les grands utilisateurs de services; et 3) le contrôle des dépenses gouvernementales découlant de la conjoncture économique générale. Nous employons les données publiques disponibles sur les dépenses nationales de santé, de l'Institut canadien d'information sur la santé, afin d'évaluer la qualité de chacun de ces incitateurs, en mettant l'accent sur la Colombie-Britannique. Nous avons dégagé certaines données concernant les effets des changements pharmaceutiques et technologiques, mais l'effet dominant reste le contrôle sur les dépenses gouvernementales, lequel est plus important pour les services non couverts par l'assurance maladie. Ces changements laissent entrevoir d'éventuels effets non-intentionnels en matière d'accès et d'équité, lesquels devraient être mieux compris avant de déclarer victoire sur le contrôle des dépenses de santé.

Healthcare expenditures are increasing in OECD countries including Canada, but the pace has slowed since 2008/2009 (OECD 2017). OECD data show an average annual growth in per capita health spending of 3.4% for 2005–2009 but only 0.5% for 2009–2013 (OECD 2015). There is extensive literature on healthcare expenditure trends (Chandra et al. 2013; CIHI 2013b; Cuckler et al. 2013; Cutler and Sahni 2013; Morgan and Astolfi 2014; Roehrig et al. 2012) which we do not re-produce here. Instead, this analysis focuses on the most recent period of slowed spending growth, and attempts to identify its causes and potential consequences, with a specific focus on British Columbia. In contrast to other analyses (Di Matteo and Busby 2016; McGrail and Evans 2014), we focus both on total spending, and private and public contributions to this total.

What Might Be Controlling Healthcare Expenditures?

One potential explanation is changes in pharmaceuticals and other technological innovations. In the pharmaceutical sector, a few expensive drugs came off patent, there have been fewer new blockbuster drugs and governments have focused on controlling drug costs. The combination of these developments may have at least temporarily disrupted increasing expenditure on pharmaceuticals (Cutler and Sahni 2013; Morgan and Astolfi 2014). At the same time, advances in other health technologies have slowed and there continues to be a shift in care from in-patient to out-patient settings (Cutler and Sahni 2013).

A second possibility is that health reform efforts are working. Many recent health reforms are built around the "Triple Aim" of improving the experience of care, improving population

health and controlling per capita expenditures on health (Berwick et al. 2008). In many jurisdictions, a commitment to the Triple Aim prompted reforms that focus on chronic disease management and/or modifying service delivery for high users of healthcare services (Delon and MacKinnon 2009; General Practice Services Committee 2015; MOHLTC 2012). Reforms involving better coordination of care for patients moving among healthcare providers and the introduction and improvement of disease management programs may decrease hospitalizations, improve the health status of patients and positively change their health behaviours (Brown et al. 2012; Lorig et al. 1999), all of which could lead to lower costs.

A third possibility is macroeconomic: the financial crisis in 2007–2009 forced governments to curtail public spending on healthcare. Some suggest this is the case, but the effects may be temporary in that once economies fully recover we will again see increases in healthcare expenditure growth (Cuckler et al. 2013; Cutler and Sahni 2013). In the absence of cost reductions coming from the health sector, governments may simply curtail spending in the areas that are most amenable to change in the short term. In Canada, this is likely to mean decreased spending in pharmaceuticals, other institutions and/or other health spending, as these are services outside the mandate of the *Canada Health Act* (Canada Health Act 1985), which covers only the hospital and physician sectors. A decrease in public spending on services not mandated by the *Canada Health Act* can be offset by increased private insurance coverage or by out-of-pocket spending, or can result in a decrease in access to and use of services. The effects of limited access may in some cases be offset by an increase in informal care, such as family members taking on the care of frail elders when residential beds are not available. This informal care is not monetized and thus not captured in healthcare expenditure calculations (Keating et al. 2014), though clearly it can have equity and financial implications.

The consistency in changes in country-level healthcare spending after 2008 may lead to the conclusion that the macroeconomic argument is most persuasive. However, the pharmaceutical and technology trends put forward equally cut across international borders as do ideas for healthcare reform (Morgan and Astolfi 2014). The Triple Aim in particular has had a broad international reach (The Commonwealth Fund 2013).

One potential way to disentangle the causes of cost-curve bending is to assess how changes in per capita spending on healthcare occur across age groups, across health sectors, and in terms of shares of public and private spending. If, for example, we observe a flattening of spending only on pharmaceuticals, we might conclude that the technology change effect is dominant. If instead we see flattening of public and an increase in private expenditures, we may conclude that government belt-tightening was dominant. This same could be true, or perhaps health reform is working, if what we observe are changes in healthcare service use patterns across age groups.

All of these possibilities are examined here. We use Canada, and more specifically British Columbia (BC), as a case study, with the expectation that given the international similarity of overall trends, there will also be some similarity in its underlying causes.

What Data Can Be Used to Assess Trends?

The National Health Expenditure (NHEX) suite of data produced by the Canadian Institute for Health Information (CIHI) provides estimates of healthcare spending from 1975 forward (CIHI 2013a). Estimates of overall, public, private and sector-specific spending are available through 2016 (2015 and 2016 are forecasts), while public-sector age-specific trends are available through 2014. Spending on nursing homes and home care services is included in broader groupings; the former is the dominant part of "other institutions," whereas the latter is the non-dominant part of "other health spending." In 2016, hospitals, physicians, drugs, other institutions and other health spending accounted for 73% of total health expenditures in BC; it is those categories that are the focus here.

Current expenditures were converted to constant dollars using the implicit price index provided in an appendix to the NHEX data. This index is built based on public spending and so is imperfect as an adjuster, but consistently applied provides a reasonable approach to approximating constant dollars. We assess overall spending trends, public spending as a share of total, and both overall and age-specific trends for the five sub-sectors.

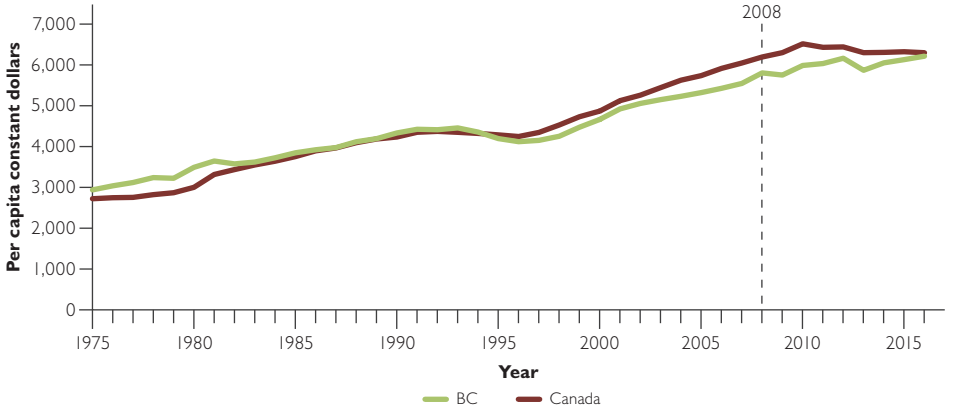
What Do the Data Show?

Overall spending in BC and in Canada follows the international trend, with increases slowing after 2008 (Figure 1). BC, home to about 12% of the Canadian population, shows a somewhat greater flattening of the curve, at least until 2016 (which are still projections). Figure 2 shows the percentage of the total and of each of the five sub-sectors paid for through public funding for BC. The share of total spending from public sources shifted very little from 1975 to 2016, starting and ending this period at 70%. There have, however, been some changes beneath this surface since 2008, including decreases in public coverage of drugs (34%–30%), other health spending (85%–70%) and other institutions (70%–56%). The latter in fact fell from a high of 88% in 2002.

Total per capita spending (Figure 3) in constant dollars continues to increase for hospitals, albeit more slowly in the last few years, physician spending per person has been relatively flat since 2008, drugs have been a bit up and down and the other institutions and other categories are declining. Comparing public and private spending is more revealing about differences in these latter three sub-sectors. In the case of drugs, the declines are seen in both the private and public spending. In contrast, for both other institutions and other health spending, the declines in public spending have been offset, but not completely, by increases in private spending.

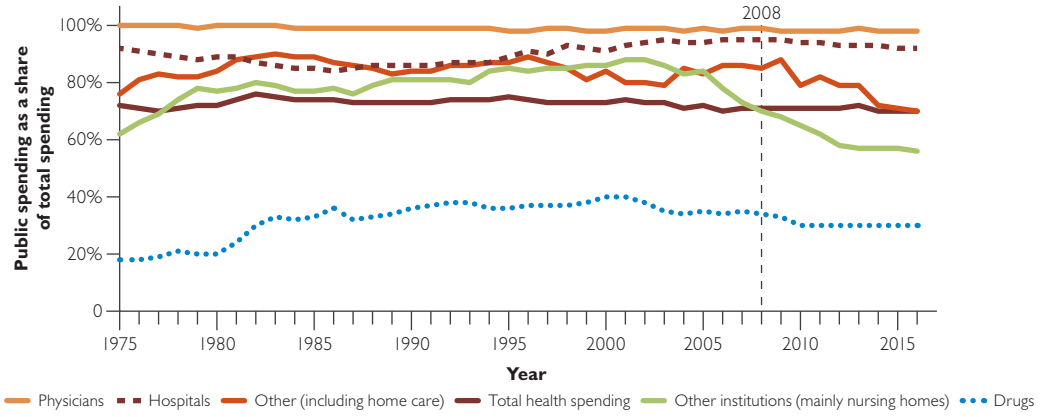
A small proportion of people, largely older adults, have significant and complex needs, and as a result consume a high proportion of total care (Reid et al. 2003). For this reason, it is important to consider age-specific patterns of use, even though these are available only for the public portion of spending and not for the "other health spending" category.

FIGURE 1. Constant dollar per capita total expenditure on healthcare, 1975–2016, Canada and BC



Source: CIHI NHEX 2016, Series A (Canada), D1 (BC) and Appendices.

FIGURE 2. Public spending as a share of total, overall and by sub-sector, BC, 1975–2016



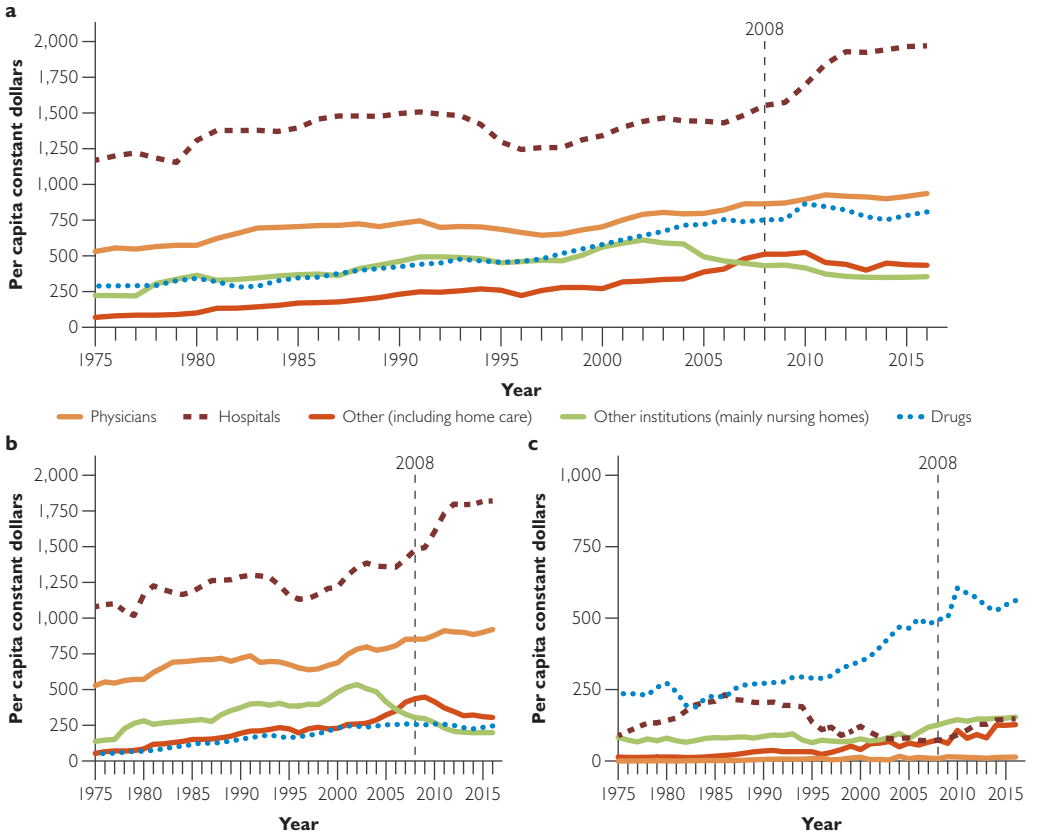
Note: Categories cover >80% of total spending. Source: Authors' calculations using CIHI NHEX, series D1 and D3.

Figure 4 shows age-specific use curves for public spending by sub-sector and overall for 1998 (first year of available information in all sub-sectors), 2008 (start of the "bend" in costs) and 2014 (last year of available information). As expected, expenditures generally rise with age, and between 2008 and 2014 overall per capita spending is relatively stable, with the largest changes seen for the youngest and oldest age groups (13.2% increase for the former, or 2.1% per year, and 12.0% decrease for the latter, or 1.9% per year). Hospital and physician services show the typical increases in spending over time, with the trends most pronounced for the older age groups. Other institutions (nursing homes) in contrast show a substantial decline in public per capita spending over time; for example, the 80–84 age group had average per capita (constant dollar) spending in this sub-sector of $4,700 in 1998, $3,200 in 2008 and $1,700 in 2014. Pharmaceutical spending per capita was stable between 2008 and 2013 for younger age groups, but there were substantial declines for those above 60.

What Are the Implications?

Healthcare costs have been increasing at slower rates in recent years, and this is not unique to BC or Canada. In BC, public and private expenditures are declining at an equal pace, as public spending as a share of total has not changed significantly since 1975. We proposed that there are three potential explanations for the bending of the cost curve in BC: changes in drugs and technology, effectiveness of targeted reform efforts and macroeconomic effects.

FIGURE 3. Total (a), public (b) and private (c), constant dollar, per capita spending, BC, 1975–2015



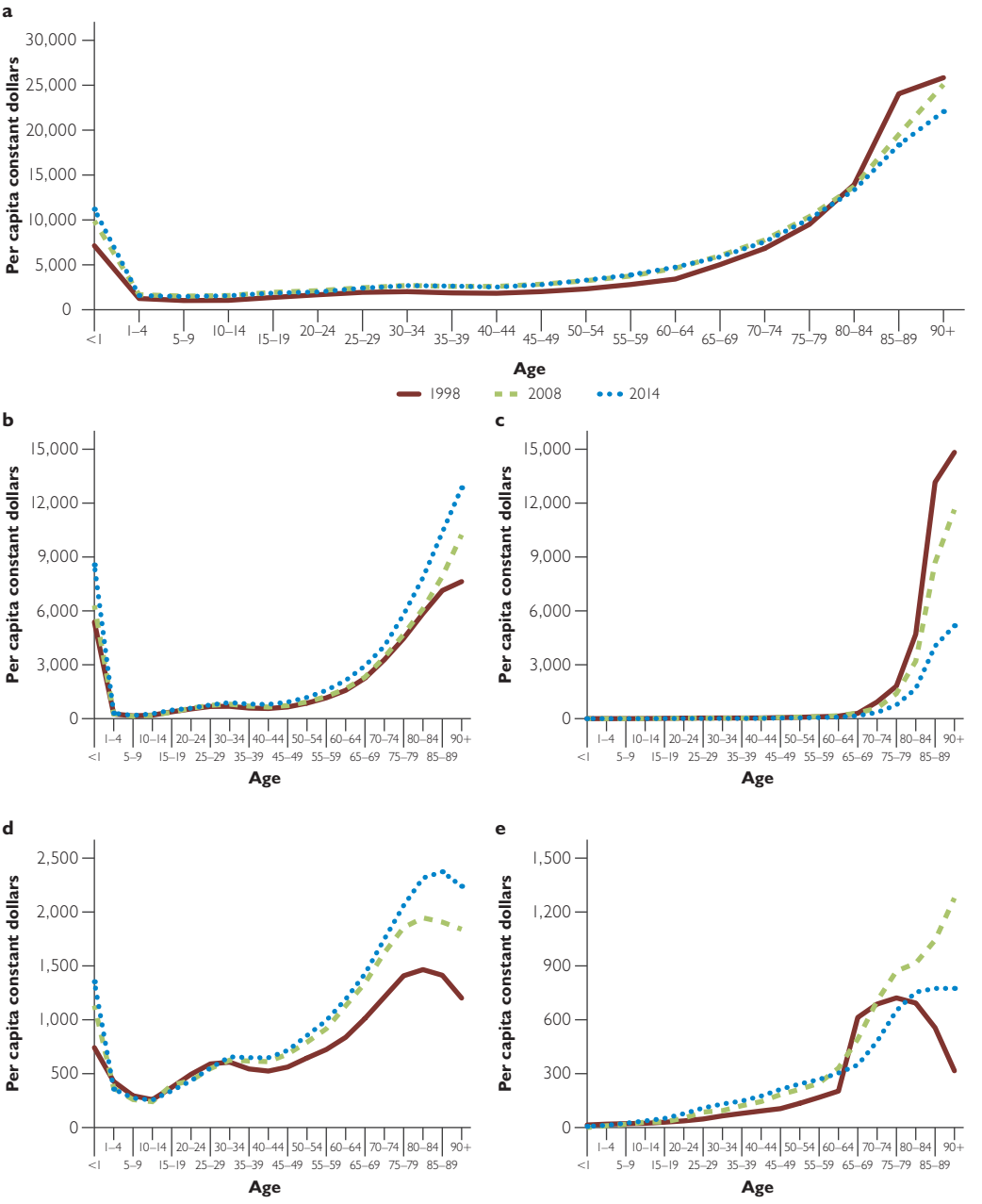
Source: Authors' calculations using CIHI NHEX, series D1, D2, D3 and Appendices.

Since 2008, the public share for drugs, and more significantly, other spending (which includes home care) and other institutions (nursing homes) have all declined. This change in share was accompanied by overall declines in spending per capita for both public and private spending on drugs, but opposing public and private trends for the other two categories.

Public-sector age-specific trends show increasing spending across age groups for physician and hospital services, mixed age-specific spending since 2008 on drugs, but decreasing spending since 1998 for other institutions. The age-specific trend in drug expenditures in combination with overall public and private trends suggests provincial cost controls and expensive drugs coming off patent were drivers of change (CIHI 2011). All of this suggests

that changes in use and cost of drugs contributed to the ending of the cost curve, but that the story is more complex than that because of some cost-shifting as well.

FIGURE 4. Age-specific, constant dollar, per capita public spending, BC, 1998, 2008 and 2014; total (a) and by sub-sector: hospitals (b), other institutions (mainly nursing homes) (c), physicians (d) and drugs (e)



Source: Authors' calculations, based on CIHI NHEX data, Series E and Appendices.

The picture for the effects of targeted reform is more stark. The pronounced change both in lower total spending and lower share of public spending for other institutions and other health spending in part reflects a static supply of beds while the population is aging (Cohen et al. 2009), which will inevitably decrease cost per capita. The intent in BC was to offset the need for nursing homes with a public investment in Assisted Living and commitment to providing more care in the community, for example, through home care and home support (Cohen et al. 2005). However, the change in public share of expenditures and increases in private spending means there was also cost-shifting; the shrinking public nursing home sector was not fully offset by increased public spending in other areas. There is no private insurance in Canada for either home care or long-term care, so the shifts in those cases must have been from public to out-of-pocket spending. Further, the decrease in total spending implies a decline in access to care which will largely affect the most economically vulnerable older adults. Any compensatory care that is provided by family members or other informal caregivers is not captured in these financial data.

In other words, more controlled expenditures are not likely the result of better care for complex, high-use patients. If it were, we ought to see the results in reduced or at least more tightly controlled hospital and physician expenditures. Instead, those expenditures continue to increase while "savings" are achieved by shifting costs from public to private spending, and more specifically in the case of home care and nursing homes, from public to out-of-pocket spending by families.

This leaves macroeconomic effects as the most prominent driver of change, consistent with the analysis of government spending (i.e., public-only) trends reported elsewhere (Di Matteo and Busby 2016). As those authors point out, constraints imposed from outside the system can have effects, but these may not be sustained (or sustainable) over time. This will be an important challenge as provinces now face lower annual increases in transfers from the federal government (Galloway and Grant 2016; Government of Canada 2012).

There are some limitations to these analyses. Public health expenditures are reported by provincial Ministries of Health to CIHI, but private expenditures must be estimated. There are reasonable sources of estimates for drug spending, but estimates are more difficult for other institutions and the "home care" part of other health spending. It is possible estimates are not accurate over time, but if they are wrong, they are likely to be underestimated, and thus, if anything, the trends seen here are conservative.

More importantly, costs for Assisted Living and home support (as opposed to home care) are not included in the CIHI data used here. Public spending on these services among the elderly (where they are most heavily concentrated), however, increased by only $50 million between 2008 and 2013 (BC Ministry of Health 2014). This increase was not quite enough to keep up with changing demographics, so including these expenditures would not materially alter the conclusions.

Finally, our analyses focus on Canada overall and BC specifically, not including other provinces. An initial assessment of the data suggested that while there are similarities across provinces, there are differences in trends too. Extending these analyses to other provinces would be instructive, but would also require in-depth knowledge of the healthcare context in each jurisdiction.

Where to from Here?

Healthcare systems everywhere have taken pride in bending the healthcare cost curve. These analyses suggest that in BC the macroeconomic hypothesis of tightening of spending is dominant, and that this tightening was selectively targeted at services that are outside the federal framework for public healthcare and can thus be treated as "discretionary." This means we are shifting more costs to patients and their families. To the extent this means more informal care, the magnitude of this shift will be underestimated (perhaps substantially) in total health expenditures.

If the macroeconomic hypothesis is dominant in other provinces and countries as well, the specific effects on healthcare systems may be different, but the ultimate effects on equity and access are likely to be similar. Moreover, if history is a guide, these externally imposed constraints may not hold, as technological innovation expands again and populations continue to age. The aspiration must be to control costs while maintaining or improving the quality of care and the population's health (Berwick et al. 2008).

Bending the cost curve by transferring costs to older, sick people and their families has not been an explicit policy choice in BC. That these changes may occur through the unintended consequence of a number of other choices does not blunt the impact they have on those affected. While the cost curve may be bending in healthcare, attention to the equity and access implications are required before declaring victory.

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References

BC Ministry of Health. 2014. *Health System Matrix, Version 5.0*. Victoria, BC: BC Ministry of Health Services.

Berwick, D.M., T.W. Nolan and J. Whittington. 2008. "The Triple Aim: Care, Health, and Cost." *Health Affairs* 27(3): 759–69. doi:10.1377/hlthaff.27.3.759.

Brown, R.S., D. Peikes, G. Peterson, J. Schore and C.M. Razafindrakoto. 2012. "Six Features of Medicare Coordinated Care Demonstration Programs that Cut Hospital Admissions of High-Risk Patients." *Health Affairs* 31(6): 1156–66. doi:10.1377/hlthaff.2012.0393.

Canada Health Act. 1985, c. C-6. Retrieved January 25, 2017. <http://laws-lois.justice.gc.ca/PDF/C-6.pdf>.

Canadian Institute for Health Information (CIHI). 2011. *Health Care Cost Drivers: The Facts, Spending and Workforce*. Ottawa, ON: Author. Retrieved January 25, 2017. <https://secure.cihi.ca/free_products/health_care_cost_drivers_the_facts_en.pdf>.

Canadian Institute for Health Information (CIHI). 2013a. *National Health Expenditure Database*. Ottawa, ON: Author. Retrieved January 25, 2017. <https://www.cihi.ca/en/national-health-expenditure-database-metadata>.

Canadian Institute for Health Information (CIHI). 2013b. *National Health Expenditure Trends, 1975 to 2013*. Ottawa, ON: Author. Retrieved January 25, 2017. <https://secure.cihi.ca/free_products/NHEXTrendsReport_EN.pdf>.

Chandra, A., J. Holmes and J. Skinner. 2013. "Is This Time Different? The Slowdown in Healthcare Spending." *NBER Working Paper Series* No. 19700. Cambridge, MA: National Bureau of Economic Research. Retrieved January 25, 2017. <http://www.nber.org/papers/w19700.pdf>.

Cohen, M., J. Murphy, K. Nutland and A. Ostry. 2005. *Renewal or Retreat? Continuing Care Renewal or Retreat? BC Residential and Home Health Care Restructuring*. Vancouver, BC: Canadian Centre for Policy Alternatives. Retrieved January 25, 2017. <http://policyalternatives.ca/sites/default/files/uploads/publications/BC_Office_Pubs/bc_2005/continuing_care.pdf>.

Cohen, M., J. Tate and J. Baumbusch. 2009. *An Uncertain Future for Seniors: BC's Restructuring of Home and Community Health Care, 2001–2008*. Vancouver, BC: Canadian Centre for Policy Alternatives. Retrieved January 25, 2017. <https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC_Office_Pubs/bc_2009/CCPA_bc_uncertain_future_full.pdf>.

Cuckler, G.A., A.M. Sisko, S.P. Keehan, S.D. Smith, A.J. Madison, J.A. Poisal et al. 2013. "National Health Expenditure Projections, 2012–22: Slow Growth until Coverage Expands and Economy Improves." *Health Affairs* 32(10): 1820–31. doi:10.1377/hlthaff.2013.0721.

Cutler, D.M. and N.R. Sahni. 2013. "If Slow Rate of Health Care Spending Growth Persists, Projections May Be Off by $770 Billion." *Health Affairs* 32(5): 841–50. doi:10.1377/hlthaff.2012.0289.

Delon, S. and B. MacKinnon. 2009. "Alberta's Systems Approach to Chronic Diseases Management and Prevention Utilizing the Expanded Chronic Care Model." *Healthcare Quarterly* 13: 98–104.

Di Matteo, L. and C. Busby. 2016. *Hold the Applause: Why Provincial Restraint on Healthcare Spending Might Not Last*. Toronto, ON: C.D. Howe Institute. Retrieved August 30, 2017. <https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_455.pdf>.

Galloway, G. and K. Grant. 2016. "Philpott, Provinces Hit Impasse over Health Funding." *The Globe and Mail*. Retrieved August 30, 2017. <https://beta.theglobeandmail.com/news/politics/philpott-provinces-hit-impasse-over-health-funding/article32434450/>.

General Practice Services Committee. 2015. "Backgrounders: The Family Practice Incentive Program." Retrieved January 25, 2017. <http://www.gpscbc.ca/media/backgrounders>.

Government of Canada. 2012. *Sustainable Social Programs and a Secure Retirement. Government of Canada, Economic Action Plan 2012*. Retrieved August 30, 2017. <http://www.budget.gc.ca/2012/plan/chap4-eng.html#a4>.

Keating, N.C., J.E. Fast, D.S. Lero, S.J. Lucas and J. Eales. 2014. "A Taxonomy of the Economic Costs of Family Care to Adults." *Journal of the Economics of Ageing* 3: 11–20. doi:10.1016/j.jeoa.2014.03.002.

Lorig, K.R., D.S. Sobel, A.L. Stewart, B.W. Brown, A. Bandura, P. Ritter et al. 1999. "Evidence Suggesting That a Chronic Disease Self-Management Program Can Improve Health Status While Reducing Hospitalization: A Randomized Trial." *Medical Care* 37(1): 5–14.

McGrail, K.M. and R. Evans, 2014. "Bending the Cost Curve in the Country of the Red Queen: B.C.'s Experience with Health Care Cost Control." In G. P. Marchildon and L. Di Matteo, eds., *Bending the Cost Curve in Health Care: Canada's Provinces in International Perspective* (pp. 271–96). Toronto, ON: University of Toronto Press.

Ministry of Health and Long-Term Care (MOHLTC). 2012. "About Health Links." Retrieved May 19, 2014. <http://news.ontario.ca/mohltc/en/2012/12/about-health-links.html>.

Morgan, D. and R. Astolfi. 2014. "Health Spending Continues to Stagnate in Many OECD Countries", OECD Health Working Papers, No. 68, Paris: OECD Publishing. doi:10.1787/5jz5sq5qnwf5-en

Organisation for Economic Co-operation and Development (OECD). 2015. "Focus on Health Spending: OECD Health Statistics 2015." Retrieved January 25, 2017. <https://www.oecd.org/health/health-systems/Focus-Health-Spending-2015.pdf>.

Organisation for Economic Co-operation and Development (OECD). 2017. "OECD.Stat: Health Expenditure and Financing." Retrieved January 25, 2017. <http://stats.oecd.org/index.aspx?DataSetCode=SHA>.

Reid, R., R. Evans, M. Barer, S. Sheps, K. Kerluke, K. McGrail, et al. 2003. "Conspicuous Consumption: Characterizing High Users of Physician Services in one Canadian Province." *Journal of Health Services Research & Policy* 8(4): 215–24. doi:10.1258/135581903322403281.

Roehrig, C., A. Turner, P. Hughes-Cromwick and G. Miller. 2012. "When the Cost Curve Bent – Pre-Recession Moderation in Health Care Spending." *New England Journal of Medicine* 367(7): 590–93. doi:10.1056/NEJMp1202111.

The Commonwealth Fund. 2013. "Achieving the Triple Aim: What the U.S. Can Learn from Other Countries." Retrieved May 26, 2014. <http://www.commonwealthfund.org/publications/newsletters/the-commonwealth-fund-connection/2013/apr/april-15-2013/recent-releases/achieving-the-triple-aim>.