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Canadian Physiotherapy Association | Association canadienne de physiothérapie

Economic Impact of Physiotherapy in Canada

Prepared for Canadian Physiotherapy Association

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Acknowledgments

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Executive Summary

- Illnesses, diseases, injuries, and disability impose a heavy economic cost on Canadians. This cost comes in the form of direct health care spending to treat illness and indirectly in the form of lost wages and productivity as illness and disability keep Canadians out of work.
- Overall, based on data from Public Health Agency of Canada, we estimate that **the current economic burden of illness on the Canadian economy is $236.3 billion per year**.
- Given the challenges facing our health care systems, there is a need to rethink traditional approaches to providing healthcare with an aim to reduce the economic cost of illness and to reduce the cost of providing care where appropriate.
- Existing research has shown that physiotherapy can be cost-effective in improving patient outcomes and saving health costs.
- Currently, **15% of Canadians receive physiotherapy services each year**. Demand for physiotherapy has grown considerably over the past decade as Canada's population ages. Projections suggest demand will continue to grow strongly. However, projections also suggest there will be a shortage of physiotherapists in the workforce compared to demand over the next ten years.
- Canada already lags peer countries in the number of physiotherapists per capita. **There would need to be a 62% increase in the number of physiotherapists to bring Canada to the OECD average**, given our current population.
- At the current level of physiotherapy access, we calculate that **physiotherapy is already reducing the burden of osteoarthritis, back pain and coronary heart disease by $232 million (5%) per year**. Our modeling further suggests that **improving physiotherapy supply to the OECD average has the potential to further reduce the annual burden of illness by $144 million (3%) across these three diseases**.
- If future research finds similar impacts across other diseases, **the total impact of increasing the supply of physiotherapy could stretch into the billions of dollars**.
- If the gains outlined in this report are to be realized, there will be a need to increase the number of practicing physiotherapists in Canada. This will require coordinated action from different players to increase the number of Canadian universities offering physiotherapy programs; increase the number of seats in existing programs; and credential more immigrant physiotherapists to practice in Canada.

Key Takeaways

Given the challenges Canada faces with rising health care costs, policymakers and providers need to seek creative and effective ways to provide Canadians the care they deserve while carefully shepherding system resources. In this report, we present evidence that the use of physiotherapy interventions can reduce the burden of illness. Below, the key results are summarized.

Establishing the Current Context

Current Economic Burden of Illness

We present the current economic burden of illness in Canada, along with the burden of specific illness categories that may be good candidates for physiotherapy.

Validating the Relationship

Literature Review

We search the existing health and health economics literature for evidence of the cost-effectiveness of physiotherapy on key disease categories.[1]

Determining the Economic Impact

Economic Modeling

Using the information collected in the first two stages, along with other data sets, we model the burden of illness under scenarios where an increase in the number of physiotherapists allows physiotherapy care to be expanded to more Canadians.

1. According to the World Health Organization, an intervention is considered cost-effective if the cost of improving one year of life is no more than three times the gross domestic product per capita. Refer to Abbreviations and Definitions for detail.

Physiotherapy's Impact on the Burden of Illness

Economic Burden of Illness

The current economic burden of illness in Canada totals $236.3 billion, where 30% is attributed to three of the major disease categories treated by physiotherapy interventions.

Physiotherapy and the Burden of Illness

Physiotherapy is currently lowering the economic burden of the three diseases we studied by $232 million (5%) per year. Increasing the number of physiotherapists in Canada to the OECD average could further reduce the burden of these diseases by $144 million per year.

Effectiveness of Physiotherapy

A review of the literature has shown that physiotherapy can be cost-effective in improving patient outcomes, with the overall gross value gained exceeding the costs, and has the potential to save healthcare costs.

The Next Decade

A shortage of physiotherapists is projected over the next decade. More effort needs to be done to ensure an adequate supply of therapists and improve access for all Canadians.

Table of Contents

Introduction and Objectives

- This study aims to quantify the economic impact that physiotherapy interventions can yield to Canada's healthcare system and economy.

- The analysis is divided into four parts:
    1) **First, we provide a snapshot of the current state of the physiotherapy profession in Canada**. This includes a brief description of the services provided by physiotherapists and licensing requirements; current workforce size and distribution; a forecast of the demand for and supply of physiotherapists over the next decade; and a discussion of the breakdown of physiotherapy costs between private and public payers.
    2) **Next, we calculate a base case for the economic cost of illness in Canada.** In consultation with panels of physiotherapists, we shortlisted three disease categories from the International Statistical Classification of Diseases and Related Health Problems (ICD) where physiotherapy interventions are likely to have the greatest impact. For each of these disease categories, we calculate an up-to-date estimate of the cost burden of illness.
    3) **We then review the impact of physiotherapy interventions.** Employing a combination of primary and secondary research, we estimate the impact of physiotherapy interventions on patient outcomes, and consequently on key parameters driving direct and indirect costs related to the disease categories in focus.
    4) **Finally, we estimate the economic impact of physiotherapy interventions.** We re-calculate the economic burden of the diseases of focus under alternate scenarios where physiotherapy interventions are accessible to a broader number of Canadians. These interventions yield changes to patient outcomes and subsequently changes to the aggregate direct and indirect costs based on the prior analysis.

Report Structure

The remainder of the report is organized as follows:

- **Chapter 1: Profile of Physiotherapy in Canada**
- **Chapter 2: Current Economic Burden of Illness in Canada**
- **Chapter 3: Evidence for the Impact of Physiotherapy Interventions**
- **Chapter 4: Economic Impact of Physiotherapy**

Abbreviations and Definitions

Abbreviations	Full Name	Definition
PT	Physiotherapist	Abbreviation used where space does not allow for full name of profession.
CE	Cost-effectiveness	According to the World Health Organization, an intervention is considered cost-effective if the cost of saving one year of life is no more than three times the gross domestic product per capita at the willingness-to-pay level. In cost-effectiveness studies, interventions that cost less than the willingness-to-pay level to produce a quality-adjusted life year (QALY) are considered cost-effective. Interventions that cost less than the compared intervention (often the usual care) to produce a QALY are considered cost-saving.
EBIC	Economic Burden of Illness in Canada	EBIC provides a comprehensive overview of the distribution of direct and indirect costs of illness and injury in Canada. Direct costs measures the dollars spent in the healthcare system treating each disease. Direct costs include the following components : hospital care, physician care, prescription drugs, dental services and vision care services and formal caregiving. Indirect costs: measures the impact of each disease on productivity. Indirect costs include the following components : lost production due to morbidity, lost production due to premature mortality and informal caregiving.
CIHI	Canadian Institute for Health Information	CIHI provides comparable and actionable data and information that are used to accelerate improvements in health care, health system performance and population health across Canada.
HRQoL	Health-Related Quality of Life	Health-Related Quality of Life measures an individual's perception of their physical, emotional, and social well-being in relation to their health status.
ICD	International Classification of Diseases	ICD is a global system of codes used by healthcare professionals to classify and code diseases, symptoms, injuries, and other health conditions.
NHEX	National Health Expenditure Database	NHEX provides detailed information on health spending in Canada.
OECD	Organization for Economic Cooperation and Development	Intergovernmental organization representing 38 developed countries. Provides a variety of comparative international data for member countries.
PHAC	Public Health Agency of Canada	The agency of the Government of Canada responsible for public health, emergency preparedness and response, and infectious and chronic disease control and prevention.
QALY	Quality adjusted life years	QALY is a measure of disease burden that considers both the quality and the quantity of life lived, often used in health economics to assess the value of health interventions.
RCT	Randomized Control Trials	RCTs are a type of study design in which participants are randomly assigned to either an intervention or control group to evaluate the effectiveness of a treatment or intervention.
VSLY	Value of a Statistical Life Year	VSLY is a measure used to estimate the monetary value of a one-year extension of a person's life expectancy resulting from a health intervention or policy.

Units			
CAD	Canadian Dollar	k	Thousand
USD	United States Dollar	M	Million
AUD	Australian Dollar	B	Billion

Profile of Physiotherapy in Canada

Chapter 1

Physiotherapists in Canada

What is a physiotherapist?

- Physiotherapy is a regulated health profession focused on preventing disease, injury, and disability; managing acute and chronic conditions, activity limitations, and participation restrictions; improving and maintaining optimal functional independence and physical performance; and educating and planning maintenance and support programs to prevent re-occurrence, re-injury, or functional decline.[1]
- Physiotherapy has been practiced in different forms for centuries. In Canada, the organization that became the Canadian Physiotherapy Association was founded in 1920, and the first university diploma program for physiotherapy began accepting students in 1929.[2]
- Today, physiotherapists practice in a wide range of settings such as hospitals, community care settings, private practice, long-term care homes, home care, and schools. Physiotherapists use a wide variety of techniques, including exercises, education, and manual therapy.
- Physiotherapy is a regulated profession in Canada. Therapists must be licensed in order to practice. Licensing is done by separate bodies in each province and territory.
- To become licensed as a physiotherapist, practitioners must complete an undergraduate degree and a two-year graduate degree in physiotherapy, as well as supervised practical training. Individuals who received their education or training outside Canada must have their credentials assessed by the licensing body and complete a certification examination.
- As a key component of the health care system, physiotherapy plays a crucial role in improving patient outcomes, reducing the economic burden of illness, and enhancing the overall quality of life for Canadians.

Patient
- Reduced pain and discomfort
- Faster recovery
- Fewer lost work days and corresponding impact on earnings

Health Care System
- Improved patient outcomes
- Reduced demand for other health system resources
- Reduced wait times for initial treatment

Society
- Improved productivity
- Lives less affected by injury, disease, and disability
- Reduced burden on caregivers

1. CPA (2012). Description of Physiotherapy in Canada. https://physiotherapy.ca/app/uploads/2022/08/dopen-en.pdf.
2. Newell, Sarah. "Physiotherapy," in Bourgeault, I.L. (Ed) (2021) Introduction to the Health Workforce in Canada. https://www.hhr-rhs.ca/images/Intro_to_the_Health_Workforce_in_Canada_Chapters/20_Physiotherapy.pdf.

Profile of Physiotherapy in Canada

How many physiotherapists are practicing in Canada?

- There are 28,038 licensed physiotherapists in Canada, of which 97% or 27,197 are practicing, with the remainder in training or out of work.[1]
- Over the past decade, the physiotherapist workforce has consistently grown. The number of practicing physiotherapists in Canada has grown 40% over the past decade (see chart 1).
- Over the same period, the Canadian population grew by 11%. The physiotherapy profession is therefore growing much faster than the population, demonstrating a growing need for physiotherapy services (see chart 2).
- Physiotherapists are not distributed evenly across the country. There are 24,451 physiotherapists working in urban areas, compared to 1,880 working in rural and remote areas.[1] The best-served province, British Columbia, has 44% more physiotherapists per capita than the least-served province, Newfoundland and Labrador (see chart 3).
- In the most recent year of data, 14.7% of Canadians received at least one physiotherapy treatment.[2] This percentage can vary considerably if the person is suffering from certain ailments.

Chart 1: Physiotherapy profession has grown strongly

Number of practicing physiotherapists in Canada, 2013 and 2022

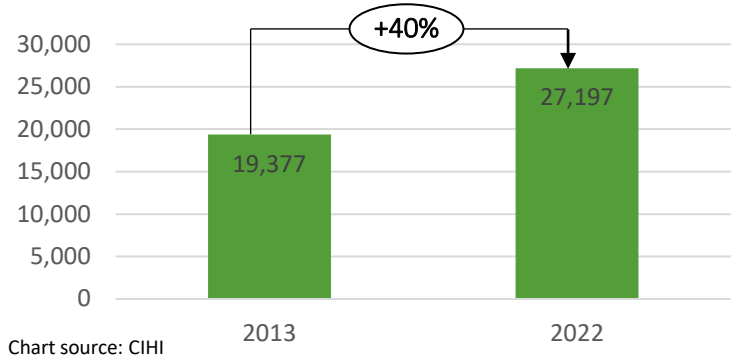
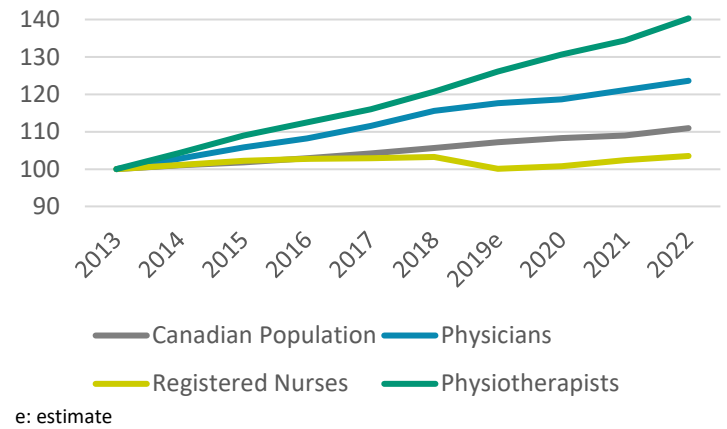


Chart source: CIHI

Chart 2: Physiotherapy has been growing faster than other health professions

Number of health care professionals and population; index, 2013=100



e: estimate

Chart source: CIHI, Statistics Canada, Deloitte calculation

Chart 3: Density of physiotherapists varies across Canada

Practicing physiotherapists per 1,000 population, provinces, 2022

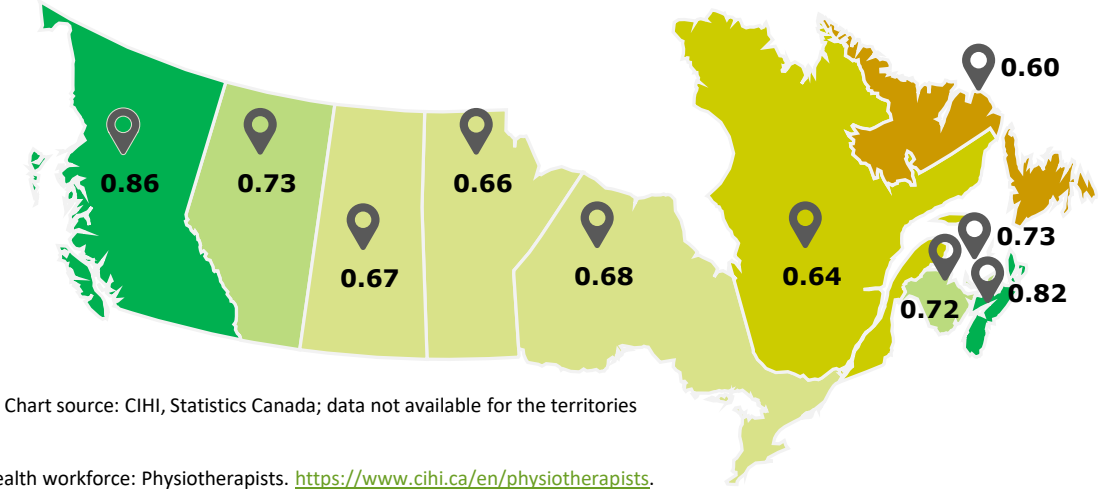


Chart source: CIHI, Statistics Canada; data not available for the territories

1. CIHI (2023). Health workforce: Physiotherapists. https://www.cihi.ca/en/physiotherapists.
2. Statistics Canada (2017-18). Canadian Community Health Survey Public Use Microdata. https://www150.statcan.gc.ca/n1/en/catalogue/82M0013X.

Profile of Physiotherapy in Canada

Labour market outlook for physiotherapy

- Over the 2019-2021 period, the unemployment rate among physiotherapists was just 1.0%, far below the 7.5% unemployment rate for the general population during the same period.[1]
- The median salary for physiotherapists in Canada was $62,800 in the 2021 census, much higher than the median Canadian salary of $37,200.[2]
- The median physiotherapist is 41 years old, making it a relatively young profession.
- Over the next decade, Employment and Social Development Canada (ESDC) expects that demand for physiotherapists will increase significantly, with 14,300 new physiotherapists needed to meet future demand and cover expected retirements (see table 1).
- Over the same period, 14,100 new physiotherapists are expected to enter the workforce (see table 2).
- Once retirements have been accounted for, that means the number of practicing physiotherapists will reach approximately 37,000 by 2031.
- These figures imply that the physiotherapy profession will grow by another 36% over the next decade compared to current levels. This is a similar pace of growth to what we saw over the past decade.
- A major component of this future growth is related to Canada's aging population. Physiotherapists have an important role to play in assisting with the treatment and prevention of ailments and restrictions that come along with an aging population.[3]
- Given that new supply will not quite keep up with demand and considering that the current workforce of physiotherapists is fully employed, ESDC identifies physiotherapists as an occupational group that is showing strong signs of a structural shortage of workers.[1]

Table 1: More demand for physiotherapy expected over next decade…

Forecast of future demand for physiotherapists, 2022 through 2031

Source of demand	Number of PTs
Additional demand	8,600
Retirement replacement	4,300
Emigration	700
Other replacement	700
Total Projected Job Openings	**14,300**

Table source: Employment and Social Development Canada

Table 2: …but the supply of physiotherapists won't quite keep up

Forecast of future supply for physiotherapists, 2022 through 2031

Source of supply	Number of PTs
New graduates	15,600
Immigration	2,900
Other	-4,400
Total Projected Job Seekers	**14,100**

Table source: Employment and Social Development Canada

1. Employment and Social Development Canada (2022). Canadian Occupational Projection System: Physiotherapists. https://occupations.esdc.gc.ca/sppc-cops/.4cc.5p.1t.3onsummaryd.2tail@-eng.jsp?tid=112.
2. Statistics Canada. Employment income statistics by occupation, major field of study and highest level of education. https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810041201. (Accessed December 18, 2022).
3. Canadian Physiotherapy Association (2023). Written submission for the Standing Committee on Finance's Pre-Budget Consultation. https://physiotherapy.ca/app/uploads/2023/09/CPA-2023-Pre-Budget-Submission.pdf.

Profile of Physiotherapy in Canada

How does the number of physiotherapists in Canada compare to other peer countries?

- Canada compares poorly with peer countries in terms of the number of practicing physiotherapists, given our population (see chart 4).
- Among all OECD countries with available data, there was an average of 1.10 physiotherapists per 1,000 population; to bring Canada up to the OECD average would require a 62% improvement from our current level of 0.68 physiotherapists per 1,000 population.[1]
- Canada's density of physiotherapists is the same as that in the United States, and better than that of the United Kingdom (0.47 per 1,000).
- But compared to the best performers, Canada is falling dramatically behind. Five countries have at least double Canada's level of physiotherapists per capita: France, Austria, Iceland, Chile, and the Netherlands.
- A further three countries have at least triple Canada's level of physiotherapists per capita: Belgium, Germany, and Norway.
- As of the latest data, Canada has 27,197 practicing physiotherapists for a population of 38,929,902. To bring our density of physiotherapists up to the OECD average, we would require 42,823 physiotherapists, an increase of 15,626 from current numbers.
- The one positive note is that the growth rate of our physiotherapy profession has been in line with our peers. In the decade prior to 2021, Canada's density of physiotherapists increased by 26% while the average OECD country's density of physiotherapists increased by 27%.
- Once again, however, the best-performing countries are growing their physiotherapy professions far faster than Canada. Nine countries grew their ratio of physiotherapists per capita by at least 62% over the past decade: Austria, Chile, Greece, Hungary, Ireland, South Korea, Latvia, Lithuania, and Turkey.

Chart 4: Canada lags peers in physiotherapists per capita

Physiotherapists per 1,000 population, OECD countries, 2021

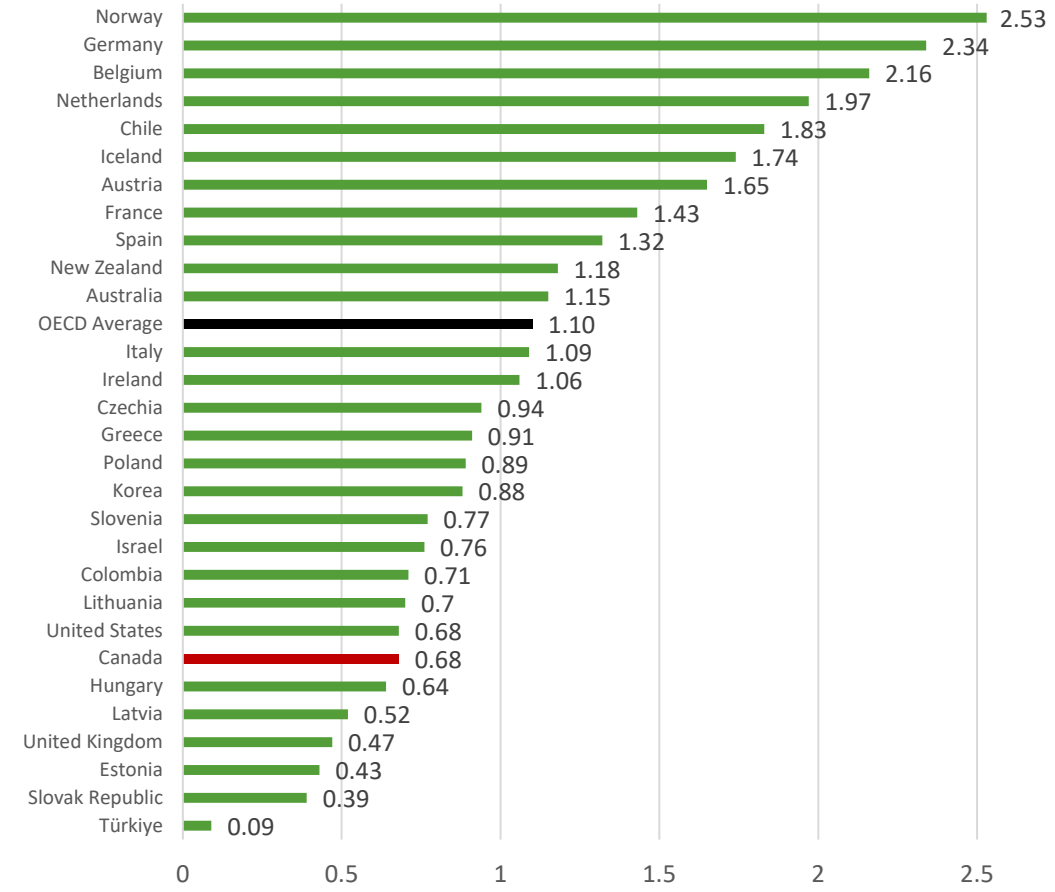


Chart source: OECD

1. OECD. Healthcare Resources : Physiotherapists. https://stats.oecd.org/index.aspx?DataSetCode=HEALTH_REAC. (Accessed December 12, 2023).

Note: Data for most countries is not yet available for 2022; therefore, 2021 is used as the comparison year for this slide.

Profile of Physiotherapy in Canada

Physiotherapy funding model

- While Canadians often think of their health care system as a purely public one, Canada in fact has a hybrid health care system, with 75% of health care spending by the public sector and the remaining 25% by the private sector.[1]
- Physiotherapists provide care in a variety of settings, including in hospitals, professional practice clinics in the community, community health centres, schools, long-term care homes, and in patients' homes (see chart 5).
- Within this context, paying for physiotherapy treatment is a split responsibility, with some spending covered by provincial and territorial health insurance plans and the remainder covered by private health insurance or out-of-pocket spending.
- In 2022 there were 7,668 physiotherapists employed in the public sector and 11,489 employed in the private sector (see chart 6).[3]
- According to CIHI, 1.7% of public sector health care spending is allocated to "other professionals," the grouping that includes physiotherapists (see chart 7). Meanwhile, 32.3% of private sector health care spending is allocated to "other professionals" (see chart 8).[2]
- In data from 2012, physiotherapy claims made up 5.5% of private health insurance claims in Canada.[4] These claims were valued at $350 million to $450 million per year; accounting for inflation in health care costs, this would be equivalent to $471 million to $606 million in 2023 dollars. Note that this data point predates the significant growth in physiotherapy we have seen over the past decade; if physiotherapy claims had grown at the same rate as the number of professionals practicing, they would be 40% higher in 2022, which could put them in the range of $660 million to $848 million.

Chart 5: PTs work in diverse settings

Physiotherapists employed in direct care by setting of employment, percent

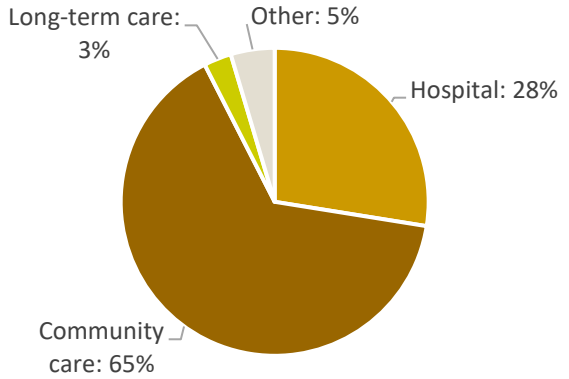


Chart 6: Most PTs work in private sector

Physiotherapists employed in direct care by sector of employment, percent

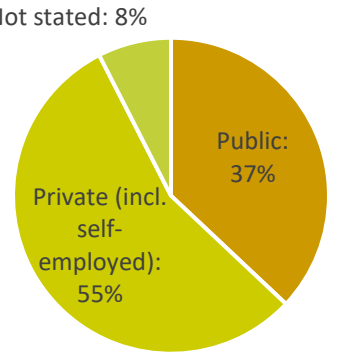


Chart 7: PTs make up a small portion of public health spending

Public health spending on "other professionals," percent

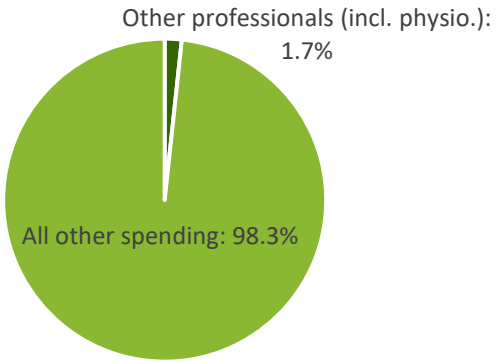


Chart 8: PTs make up a much larger share of private health spending

Private health spending on "other professionals," percent

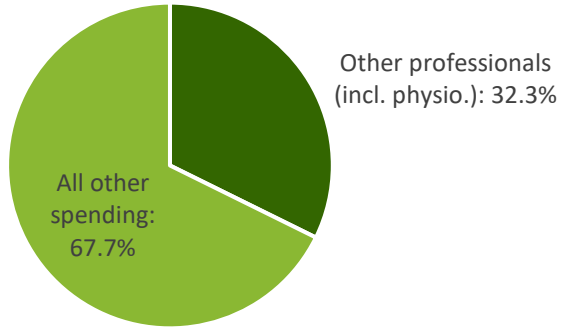


Chart source (all charts): CIHI

1. CIHI (2022). National Health Expenditure Database (NHEX). https://www.cihi.ca/en/national-health-expenditure-trends.
2. CIHI (2022). Public and Private Sector Health Expenditures by Use of Funds. https://www.cihi.ca/en/public-and-private-sector-health-expenditures-by-use-of-funds.
3. CIHI (2023). Health workforce: Physiotherapists. https://www.cihi.ca/en/physiotherapists.
4. Conference Board (2017). The Role of Physiotherapy in Canada. https://www.conferenceboard.ca/product/the-role-of-physiotherapy-in-canada-contributing-to-a-stronger-health-care-system/.

Current Economic Burden of Illness

Chapter 2

Impact of Physiotherapy Treatments

The role of physiotherapy in the prevention, treatment, and management of key diseases

Physiotherapists in Canada treat a wide array of diseases. Based on discussions with physiotherapists, we have focused our analysis on three categories of disease. These are by no means an exhaustive list of the categories of disease that physiotherapists treat. Physiotherapists are engaged in treating many other diseases, such as mental health issues, diseases of the respiratory system, and pelvic and women's health issues. However, for this research, we began by focusing on the areas where physiotherapy is most common and where existing evidence is most able to confirm its cost-effectiveness.

Musculoskeletal Diseases and Injuries

Musculoskeletal diseases and injuries are conditions that affect the bones, muscles, joints, and connective tissues of the body. These conditions can be caused by a variety of factors, including trauma, overuse, aging, and genetic predisposition. Common musculoskeletal diseases and injuries include osteoarthritis, back pain, fractures, tendinitis, and other conditions.[1]

Physiotherapy interventions can help people with musculoskeletal diseases and injuries by improving their range of motion, muscle function, reducing pain and inflammation, and increasing their strength and mobility through exercises and manual therapy techniques. Physiotherapists can also provide education and preventative strategies to help people manage chronic conditions and prevent future injuries.[4]

Circulatory System Diseases

Circulatory diseases are conditions that affect the heart and blood vessels. These diseases can be caused by a variety of factors, including lifestyle choices, genetics, and environmental factors. Some common circulatory diseases include coronary artery disease, hypertension, stroke, and peripheral artery disease. [2]

Physiotherapy interventions can be beneficial for people with circulatory system diseases by improving physical function, reducing pain, and preventing cardiac events through exercises and manual therapy techniques in rehabilitation programs. Physiotherapists can also provide education and preventative strategies to help individuals manage their conditions and reduce the risk of future cardiovascular events.[4]

Nervous System Diseases

Nervous system diseases are conditions that affect the brain, spinal cord, and nerves, leading to a variety of symptoms and impairments. These conditions can be caused by a range of factors, including genetics, infections, trauma, and degenerative processes. Common nervous system diseases and injuries include multiple sclerosis, Parkinson's disease, Alzheimer's disease, stroke, and spinal cord injuries. [3]

Physiotherapy interventions can help people with nervous system diseases by improving their balance, coordination, walking, and motor function, reducing spasticity and rigidity, preventing falls and injuries, and improving their overall quality of life through various therapy methods.[5]

1. National Library of Medicine. Selected Health Conditions and Likelihood of Improvement with Treatment. Washington (DC): National Academies Press (US); 2020 Apr 21. 5, Musculoskeletal Disorders.
2. Olvera Lopez E et al. Cardiovascular Disease. [Updated 2023 Aug 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan.
3. Thakur KT et al. Neurological, and Substance Use Disorders: Disease Control Priorities, Third Edition (Volume 4). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2016 Mar 14. Chapter 5.
4. Canadian Physiotherapy Association (2012). The Value of Physiotherapy. https://physiotherapy.ca/advocacy/about-physiotherapy-in-canada/the-value-of-physiotherapy/.
5. Winser S, Lee SH, Law HS, Leung HY, Bello UM, Kannan P. Economic evaluations of physiotherapy interventions for neurological disorders: a systematic review. Disabil Rehabil. 2020;42(7):892-901.

Note: Throughout this report, we use the phrase 'treat' in the context of treating not only a disease or ailment, but also its symptoms and consequences.

Current Economic Burden of Illness

Overall health care spending has been growing rapidly in Canada

- Health care spending in Canada has been growing at a rapid rate. In 2021 total public and private health spending in Canada was $331 billion, a 72% increase from the $193 billion spent in 2010.[1] The fast pace of health care spending growth reflects not only Canada's growing population, but also increases in spending per person with health expenditures per capita growing from $5,387 in 2010 to $7,851 in 2022.
- Health budgets will continue to come under pressure over the coming decade due to our aging population, strong immigration levels, improved access, and inflationary pressures related to wages and other costs. A 2020 forecast by the Conference Board of Canada projected that, based on pre-pandemic trends, health care spending would continue to increase by an average of 5.4% per cent each year through 2030.[2]
- In light of these cost pressures, policymakers and health care system managers must make difficult decisions about how to allocate scarce resources. Optimizing healthcare resources is not only important for managing the economic burden of illness in the aging population; it is also essential for ensuring that people receive the optimal care they need. By finding ways to deliver high-quality care more efficiently, healthcare systems can provide sustainable and cost-effective health care options.
- In this research, we explore the potential for expanded physiotherapy care to reduce the cost burdens faced by our health system and society.

Chart 9: Total health care spending is up 72% in Canada over past twelve years

Total health expenditures in Canada, current $, 2010 to 2022

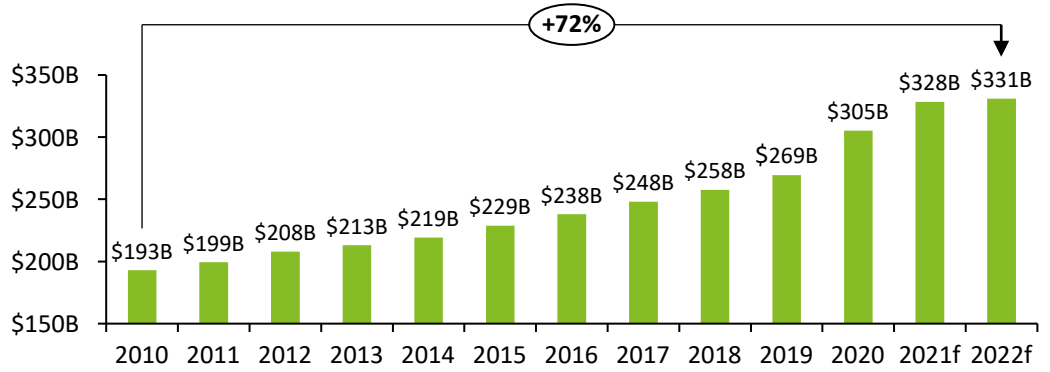
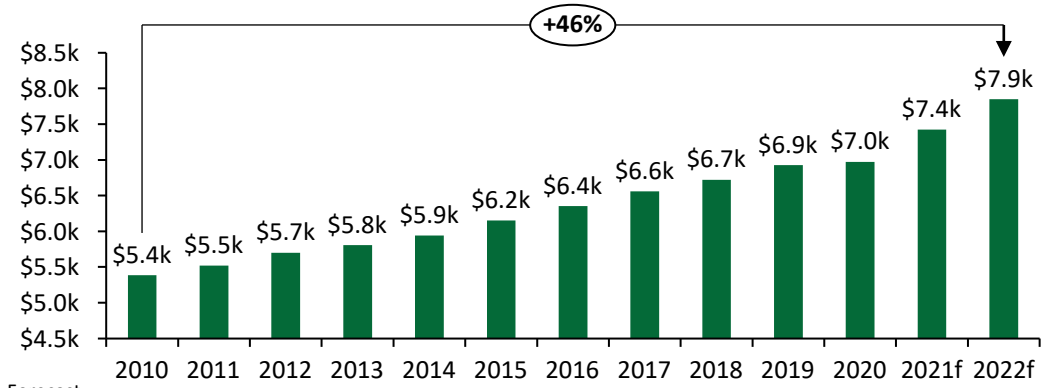


Chart 10: Over the same period, spending per person is up 46%

Health expenditures per capita in Canada, current $, 2010 to 2022



f: Forecast

Chart source: CIHI, Deloitte Analysis

Notes: Total health expenditure included hospitals, other institutes, physicians, other professionals, total drugs, public health, administration, total other health spendings, capital expenditure and COVID-19 response funding.

1. CIHI (2022). National Health Expenditure Database (NHEX). https://www.cihi.ca/en/national-health-expenditure-trends.
2. Conference Board of Canada (2020). Health Care Cost Drivers in Canada. https://www.conferenceboard.ca/wp-content/uploads/woocommerce_uploads/reports/10816_25078_impact-paper_health-care-cost-drivers.pdf.

Current Economic Burden of Illness

Disease categories where physiotherapy is most frequently used

- The table on the right shows the largest categories of disease by total cost burden in Canada, with our diseases of focus highlighted in green. This cost burden data is based on the Economic Burden of Illness in Canada (EBIC) database produced by the Public Health Agency of Canada (PHAC).
- The disease categories in the EBIC database are based on the World Health Organization's International Classification of Diseases and Related Health Problems (ICD).The figures are an attempt to quantify the 'burden' of different illnesses to the Canadian healthcare system, society, and economy.
- The latest release of EBIC data is from 2010; we have forecast this out to 2022 in the table on the right.
- The cost burden data is divided into two parts:
    - The **direct cost burden** measures the dollars spent in the healthcare system treating each disease. Direct costs include the following components: hospital care, physician care, prescription drugs, dental services and vision care services and formal caregiving. This is a way of comparing how different diseases are consuming healthcare system resources.
    - The **indirect cost burden** measures the impact of each disease on productivity. Indirect costs include the following components: lost production due to morbidity, lost production due to premature mortality and informal caregiving. Different diseases result in Canadians being out of work for different periods of time, and this has an impact not only on their income but also on the productive capacity of the economy.
- The economic burden associated with direct and indirect costs can vary among disease categories. The direct cost of circulatory system disease ($22B) is similar to that of injuries ($24B) and higher than that of musculoskeletal disease ($11B). However, the indirect cost burden of musculoskeletal disease ($3B) and injuries ($5B) is much higher than that of circulatory system disease ($0.8B).
- Note that the ICD categorizes injuries separately from musculoskeletal system disorders. Based on the discussion and feedback with physiotherapists, we have combined musculoskeletal and injury categories into a single category of disease. This is because injuries tend to impact the musculoskeletal system, and in general, decisions about physiotherapy care are more dependent on the effect of the injury or disease process on body system and its function than whether the pathology was caused by an injury. We therefore consider injuries together with musculoskeletal system disorders in the data for the subsequent economic burden of illness analysis. This reflects the way these illnesses would be categorized in physiotherapy practice.

Table 3: Economic burden of illness in Canada totals $279.6B

Direct and indirect economic burden of illness, by disease category, 2022 $ billions

	Direct cost burden	Indirect cost burden	Total burden
Injuries + Musculoskeletal	**$35.6B**	**$7.6B**	**$43.2B**
Injuries	$24.4B	$5.0B	$29.4B
Musculoskeletal	$11.1B	$2.6B	$13.7B
Digestive system	$31.8B	$0.5B	$32.3B
Circulatory system	**$21.5B**	**$0.8B**	**$22.4B**
Mental disorders	$17.3 B	$1.6B	$18.9B
Respiratory system	$10.8B	$4.1B	$14.9 B
Symptoms	$11.6B	$0.1B	$11.8B
Eye and related	$10.7B	$0.1B	$10.7B
Neoplasms	$8.9B	$1.0B	$9.9B
Endocrine	$9.1B	$0.3B	$9.3B
Genitourinary	$7.9B	$0.5B	$8.3B
Infectious diseases	$3.7B	$1.2B	$5.0B
Nervous system	**$4.5B**	**$0.6B**	**$5.1B**
All other	$38.0B	$6.6B	$44.7B

Table source: Public Health Agency of Canada, Deloitte analysis.
Musculoskeletal and injury category combines two disease categories in the EBIC: XIII: musculoskeletal and XIX and XX: injuries.

Current Economic Burden of Illness

The overall economic burden of illness in Canada

We now examine in more detail our diseases of focus. The goal of this step is to establish the total burden currently being experienced by Canada due to illnesses which could be treated by physiotherapy. In the later parts of the report, we will build on the cost burden data and examine the extent to which physiotherapy could help reduce this burden. Charts 11 and 12 below show the breakdown of our three diseases of focus by direct and indirect costs, respectively. The direct cost burden measures the dollars spent in the healthcare system treating each disease. The indirect cost burden measures the impact of each disease on productivity.

According to the latest version of the EBIC data, musculoskeletal diseases, injuries, circulatory system diseases and nervous system diseases combined accounted for 30% of the total economic burden of illness in Canada. The three diseases categories accounted for 28% of total direct costs. Injuries (12%) and circulatory system diseases (10%) ranked second and third of the costliest ICD chapters. The indirect costs of the three categories accounted for 36% of total indirect economic burden of illness. Musculoskeletal diseases and Injuries together accounted for almost 1/3 of the indirect costs.

Chart 11: Diseases of interest make up 28% of direct burden of illness

Direct component of economic burden of illness in Canada, by major disease type

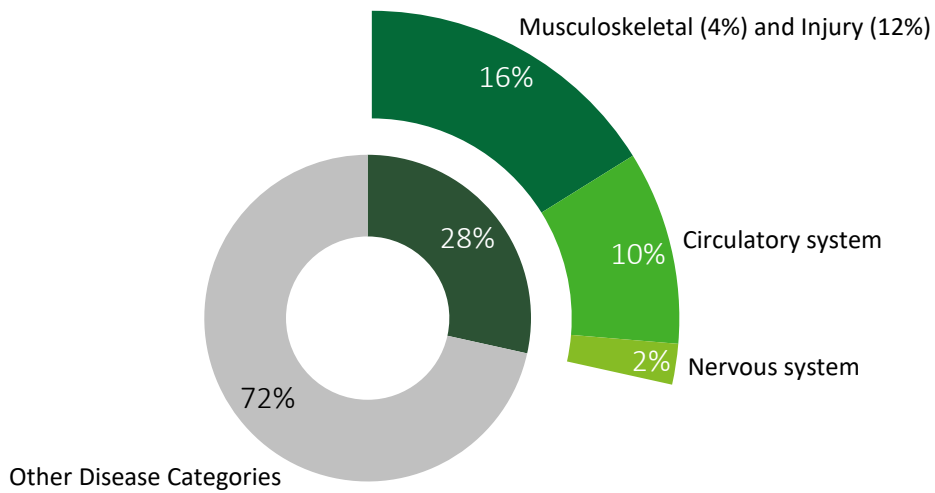


Chart source: PHAC, Deloitte analysis

Chart 12: Diseases of interest make up 36% of indirect burden of illness

Indirect component of economic burden of illness in Canada, by major disease type

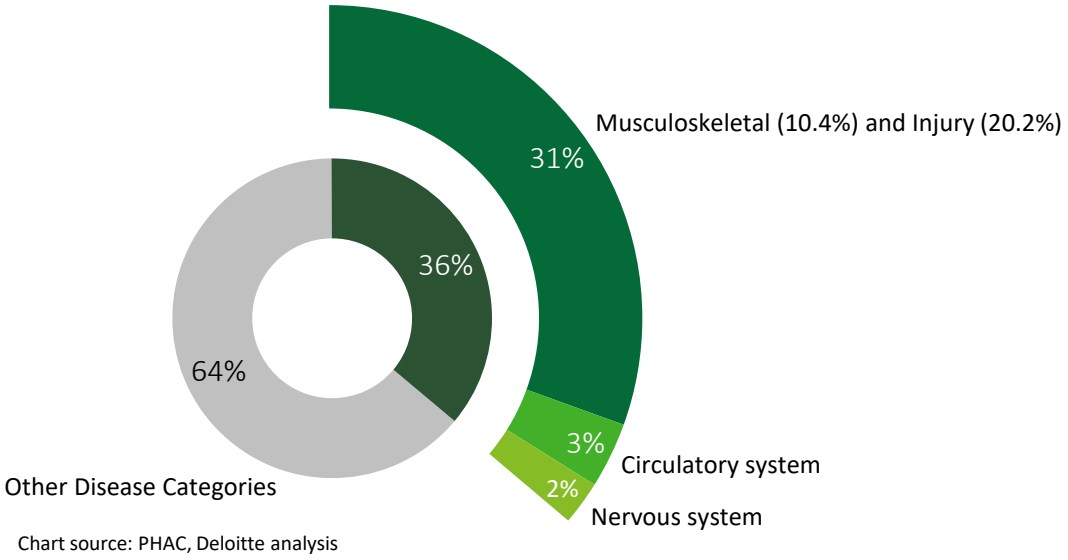


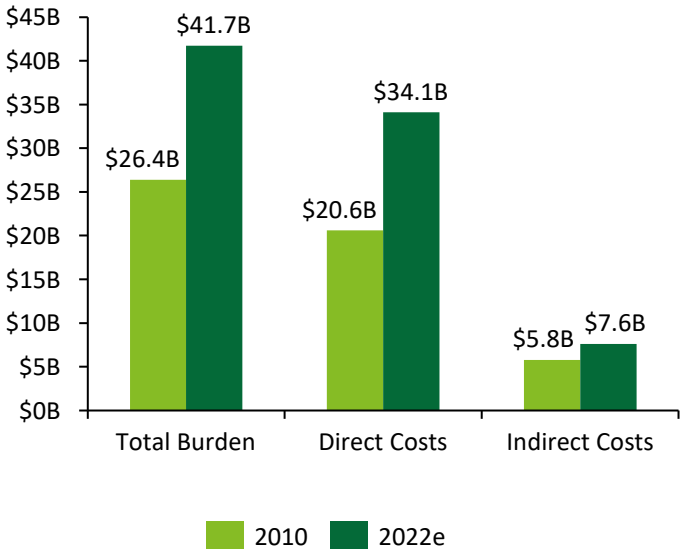
Chart source: PHAC, Deloitte analysis

Current Economic Burden of Illness: Musculoskeletal Diseases & Injuries

Musculoskeletal Diseases and Injuries

Chart 13: Economic burden of musculoskeletal diseases and injuries totals $42 billion

Current economic burden of musculoskeletal diseases and injuries in Canada, $ billions, 2010 and 2022 (estimate)



2022e: estimated

Chart 14: Musculoskeletal diseases affect millions of Canadians

Number of Canadians with chronic musculoskeletal diseases, 2010 and 2021

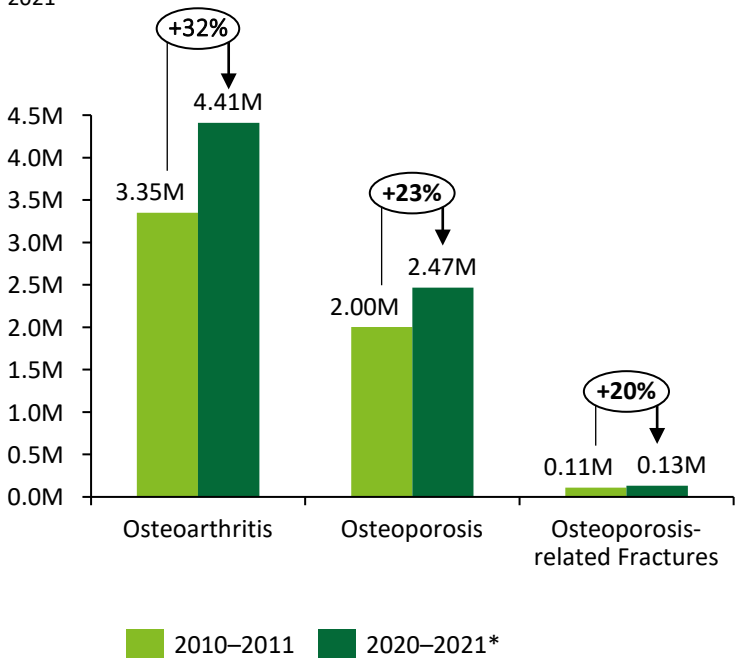


Chart source: PHAC, CCDSS, Deloitte analysis

Notes: For 2020-2021*, many CCDSS measures, such as chronic disease incidence, were influenced by the COVID-19 pandemic; Current economic burden of direct costs were estimated based on the best available most recent EBIC data in 2010 and the growth of total health expenditure in NHEX from 2010 to 2022; Current economic burden of indirect costs were estimated based on the best available most recent EBIC data in 2010, the growth of population and average income from 2010 to 2022; Osteoporosis related fractures includes any parts : forearm, hip, humerus, pelvic and spine.

Physiotherapists' skills and expertise can help in the management and treatment of people with musculoskeletal diseases and injuries. They help people manage pain, prevent further injury, and improve overall quality of life.[1]

In Canada, osteoarthritis and osteoporosis are two of the most prevalent chronic musculoskeletal conditions. The number of people affected by these two conditions reached 4.4 million and 2.5 million respectively in 2021. Canadians with osteoporosis-related fractures also reached 0.13 million.

The current economic burden of musculoskeletal diseases and injuries in Canada is estimated at $41.7 billion, with $34.1 billion in direct costs and $7.6 billion in indirect costs.

Musculoskeletal diseases and injuries accounted for 18% of the total economic burden of illness, with direct costs comprising the largest portion at 16%. They also had the highest indirect cost burden among all disease categories, accounting for 31% of the total indirect cost burden.

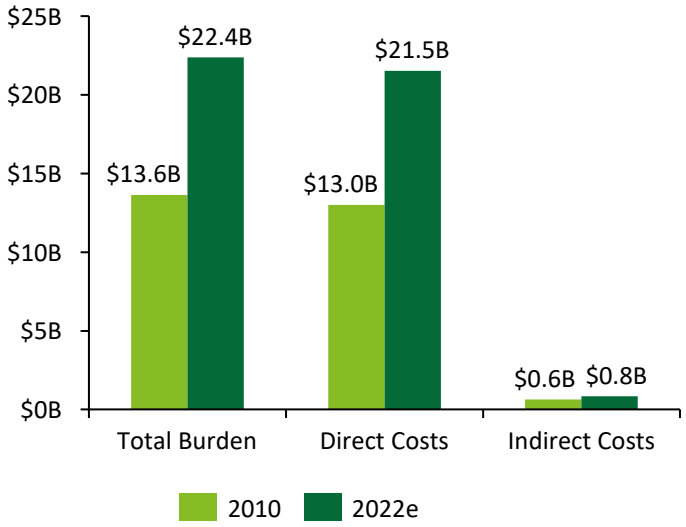
1. Canadian Physiotherapy Association. *The Value of Physiotherapy (2012)*

Current Economic Burden of Illness: Circulatory System Diseases

Circulatory System Diseases

Chart 15: Economic burden of circulatory system diseases totals $22 billion

Current economic burden of circulatory system diseases, 2010 and 2022 (estimate)



2022e: estimated

Chart 16: Circulatory system diseases affect millions of Canadians

Number of Canadians with chronic circulatory diseases and conditions, 2010 and 2021

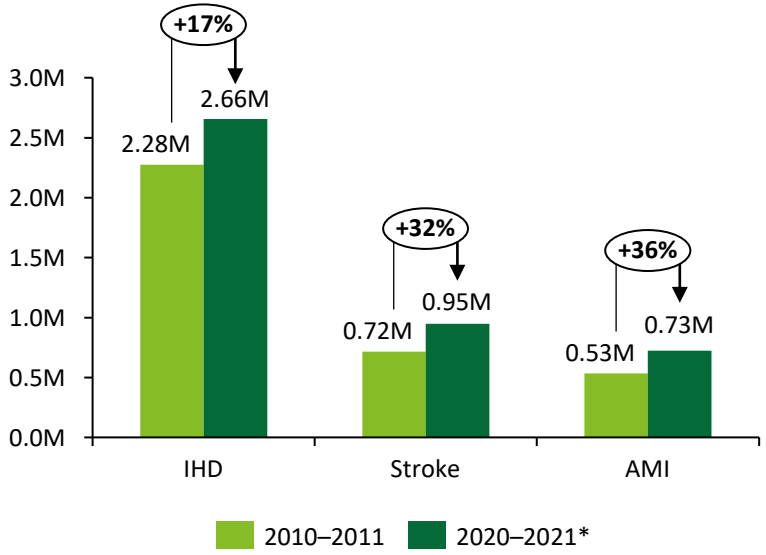


Chart source: PHAC, CCDSS, Deloitte analysis

Notes: IHD is Ischemic Heart Disease; AMI is Acute Myocardial Infarction; For 2020-2021*, many CCDSS measures, such as chronic disease incidence, were influenced by the COVID-19 pandemic; Current economic burden of direct costs were estimated based on the best available most recent EBIC data in 2010 and the growth of total health expenditure in NHEX from 2010 to 2022; Current economic burden of indirect costs were estimated based on the best available most recent EBIC data in 2010, the growth of population and average income from 2010 to 2022.

Physiotherapy is an important component of multi-disciplinary cardiovascular rehabilitation (CR). Individuals with cardiovascular diseases or conditions who receive physiotherapy experience a notable improvement in their physical function, health outcomes and overall quality of life.[1]

In 2021, the number of Canadians with ischemic heart disease (IHD) reached 2.66 million, increasing by 20% compared to 2.22 million in 2011. The number of Canadians who experienced stroke and acute myocardial infarction (AMI) reached 0.95 million and 0.73 million respectively in 2021.

The current economic burden of circulatory system diseases in Canada is estimated at $22.4 billion, with $21.5 billion in direct costs and $0.8 billion in indirect costs. As the population ages, the economic burden of cardiovascular diseases is expected to increase.

Circulatory system diseases account for 9% of the total economic burden of illness, ranking as the third highest burden after digestive system diseases and injuries. Most of the burden consists of direct costs, which make up 10% of the total direct cost burden of all diseases. The indirect costs are relatively small, at 3% of the total indirect cost burden of all diseases.

1. Canadian Physiotherapy Association. *The Value of Physiotherapy (2012)*

Current Economic Burden of Illness: Nervous System Diseases

Nervous System Diseases

Chart 17: Economic burden of nervous system diseases totals $5 billion

Current economic burden of nervous system diseases, 2010 and 2022 (estimate)

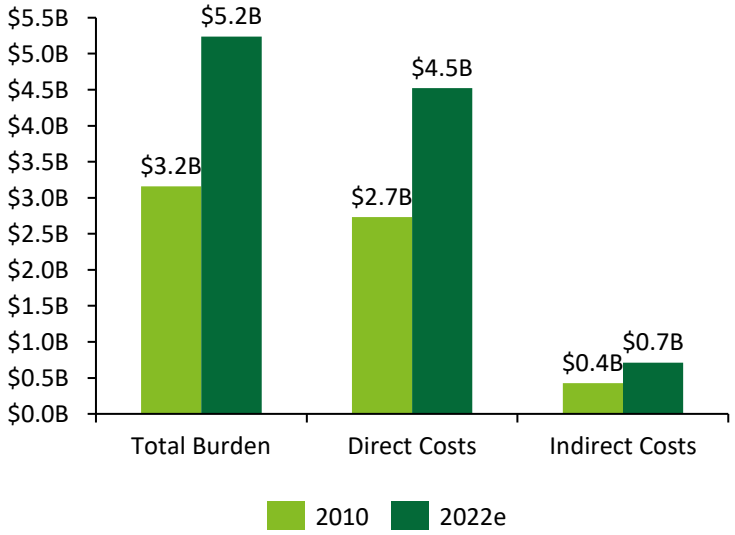
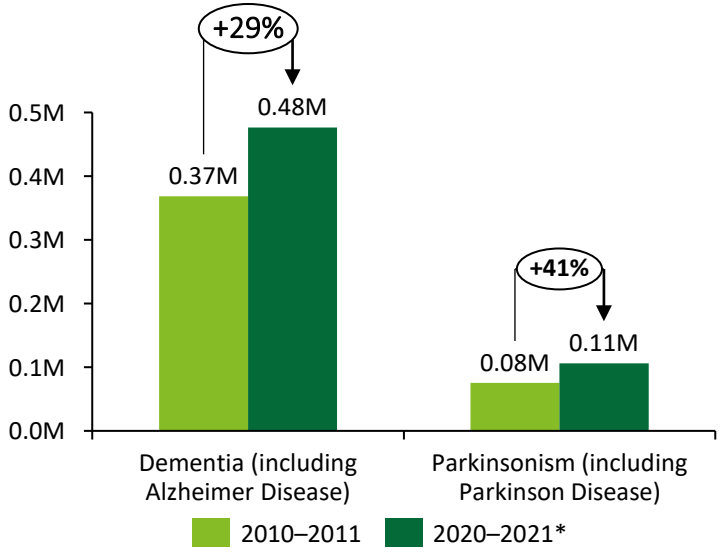


Chart 18: Nervous system diseases affect hundreds of thousands of Canadians

Number of Canadians with chronic nervous diseases and conditions, 2010 and 2021



2022e: estimated

Chart source: PHAC, CCDSS, Deloitte analysis

Notes: For 2020-2021*, many CCDSS measures, such as chronic disease incidence, were influenced by the COVID-19 pandemic; Current economic burden of direct costs were estimated based on the best available most recent EBIC data in 2010 and the growth of total health expenditure in NHEX from 2010 to 2022; Current economic burden of indirect costs were estimated based on the best available most recent EBIC data in 2010, the growth of population and average income from 2010 to 2022.

Physiotherapy can be beneficial for improving functioning and participation for people living with nervous system diseases. Physiotherapy can help improve mobility and balance, as well as reduce muscle spasms and pain. Physiotherapy interventions also prevent falls and improve individuals' overall quality of life.[1]

In 2021, the number of Canadians with Dementia (including Alzheimer disease) reached 0.48 million, an increase of 29% since 2011. The number of Canadians with Parkinsonisms (including Parkinson's disease) reached 0.11 million, an increase of 41% since 2011.

The current economic burden of circulatory system diseases in Canada is estimated at $5.2 billion, with $4.5 billion in direct costs and $0.7 billion in indirect costs.

The total burden of nervous system diseases is relatively small compared to other categories, accounting for 2% of the total economic burden of illness. Of this amount, direct costs make up 3% of the total direct cost burden, while indirect costs make up 2% of the total indirect cost burden.

1. Winser S, Lee SH, Law HS, Leung HY, Bello UM, Kannan P. Economic evaluations of physiotherapy interventions for neurological disorders: a systematic review. Disabil Rehabil. 2020;42(7):892-901.

Impact of Physiotherapy Interventions

Chapter 3

The Impact of Physiotherapy

Evidence on the cost-effectiveness of physiotherapy for reducing the impact of illness

- This chapter aims to provide valuable insights into the effectiveness and economic impact of physiotherapy interventions on patient outcomes. To do this, we started by conducting a thorough literature review of the major diseases from the three disease categories of focus:
    - Injuries and diseases of the musculoskeletal system and connective tissue, including osteoarthritis, back pain, and other conditions;
    - Diseases of the circulatory system, including coronary heart disease, stroke, and other conditions; and
    - Diseases of the nervous system, including Parkinson's disease, Alzheimer's, and other conditions.
- The scope of our review included meta-analysis and systematic review studies, randomized controlled trials (RCTs), cost-effectiveness studies, and economic impact studies of physiotherapy on relevant diseases and illnesses. Published economic impact reports for physiotherapy were also included in this study. To ensure a comprehensive analysis, studies and reports from other countries were considered.
- According to the World Health Organization, an intervention is considered cost-effective if the cost of saving one year of life is no more than three times the gross domestic product per capita at the willingness-to-pay level.[1] In cost-effectiveness studies, interventions that cost less than the willingness-to-pay level to produce a quality-adjusted life year (QALY) are considered cost-effective. Interventions that cost less than the compared intervention (often the usual care) to produce a QALY are considered cost-saving.
- One of the main challenges in conducting research on the cost-effectiveness and economic impact of physiotherapy interventions is the need for high-quality evidence. While there is a growing body of research in this area, **there is still a need for further studies to determine the effectiveness and economic impact of physiotherapy on various diseases and conditions**.
- Evaluating the cost effectiveness of physiotherapy interventions for a greater number of diseases and conditions would allow for a more fulsome analysis of the impact of increasing physiotherapy treatments. Nevertheless, the work that has been done to date provides important information that will allow us to estimate the impact of interventions on select disease conditions. This in turn has the potential to inform healthcare policy and improve patient outcomes.

1. Bertram, M. Y., Lauer, J. A., Stenberg, K., Edejer, T. T. T. Methods for the Economic Evaluation of Health Care Interventions for Priority Setting in the Health System: An Update From WHO CHOICE. *International Journal of Health Policy and Management*, 2021; 10(Special Issue on WHO-CHOICE Update): 673-677.

The Impact of Physiotherapy: Musculoskeletal Conditions & Injuries

Evidence for the impact of physiotherapy for musculoskeletal conditions and injuries

Physiotherapy is an effective intervention for improving health outcomes in people with musculoskeletal diseases and injuries. People with conditions such as osteoarthritis, joint arthroplasty, chronic pain, injuries, and other musculoskeletal conditions can benefit from physiotherapy interventions. Moreover, many of these interventions improved quality adjusted life years (QALYs) for those who received them, and are cost-effective, generating health and economic gains.

Summary of Evidence

- A systematic review of cost-effectiveness studies showed that physiotherapy only or physiotherapy added to usual care improves patient health in almost all studies.[1] The cost-effectiveness of physical therapy has been shown for several musculoskeletal conditions, such as neck pain, chronic low back pain, knee and hip osteoarthritis, and patellofemoral pain syndrome.[1]

Osteoarthritis

- Supervised physiotherapy was found to be cost-effective or cost-saving for people with osteoarthritis compared to physician-delivered usual care, according to a systematic review study (see page 6 of this report for definition of cost-effectiveness). In a two-year RCT conducted on people with osteoarthritis of the hip or knee, exercise therapy was found to be cost-saving for the health system, with reduced total health system costs and lower productivity losses due to time loss at work. Other long-term RCT studies also showed better health outcomes and reduced total and societal costs in the intervention group.[2,7,10]

Total knee or hip replacement

- Physiotherapy interventions for recipients of total hip replacement (THR) and total knee replacement (TKR) have shown significant improvements in functional performance, muscle strength, pain, range of movement (ROM), and health-related quality of life (HRQoL). An accelerated physiotherapy program for recipients of THR was found to be more effective and less costly than standard physiotherapy, with improved QALY and cost-saving. However, further studies are needed to examine the long-term effectiveness and cost-effectiveness of physiotherapy interventions for recipients of TKR.[5,6,11]

Chronic low back pain

- Physiotherapeutic interventions are cost-effective compared to the control group in most studies, according to a systematic review. A randomized trial showed that three types of physiotherapy for chronic low back pain improved pain management, quality of life, and reduced time off work by 30-48%. Exercise therapy was found to be associated with lower costs and larger effects for QALYs in people with non-specific neck and low back pain, compared to usual care.[3,4,12]

Tennis elbow

- A RCT study showed that physiotherapy can produce a statistically significant improvement in quality of life compared to the control group, and the intervention had a high probability of being cost-effective.[9]

Osteoporosis Falls Prevention

- A combined program of exercise and oral bisphosphonate therapy was cost-effective in preventing falls for people with osteoporosis in the US.[8]

Reference:
See Appendix C – Literature Review Reference

The Impact of Physiotherapy: Musculoskeletal Conditions & Injuries

Cost-effectiveness evidence for major diseases and conditions in musculoskeletal conditions and injuries

Osteoarthritis, low back pain, and total hip or knee replacement surgeries are major diseases and conditions of musculoskeletal diseases and injuries that demonstrate relatively strong evidence for physiotherapy interventions. In this section, we present the detailed findings of research on the cost-effectiveness of physiotherapy.

Osteoarthritis of Hip and Knee

- Improved health outcomes including physical function, WOMAC scores, pain and QALYs in the long-term.

- Exercise therapy was cost-effective, or cost-saving compared to usual care
- RCT showed a 10% reduction in total health system costs, and a 38% reduction in productivity losses.

- A systematic review revealed that most studies (15/16) showed cost-effectiveness or cost-saving results compared with physician-delivered usual care.[10]
- Two-year RCT of providing supervised physiotherapy in people with osteoarthritis of the hip or knee showed exercise therapy in particular was cost-saving to the health system and society, with total health system costs reduced by 10% and productivity losses reduced by 37.6%.[2]
- Long-term (30 months) RCT studies showed better WOMAC score and reduced total and societal costs in intervention group.[7]

Note: WOMAC is Western Ontario and McMaster Universities Arthritis Index, a tool used in the evaluation of the severity of osteoarthritis.
Reference: See Appendix C – Literature Review Reference

Total Hip or Knee Replacement

- For recipients of THR and TKR, improved functional performance, hip muscle strength, pain, and HRQoL.

- Accelerated physiotherapy was cost-saving compared with standard physiotherapy for recipients of THR.

- Systematic review of physiotherapy in recipients of THR showed significant improvement in health outcomes, including functional performance, muscle strength, pain, ROM and HRQoL. [6]
- RCT of THR recipients showed that an accelerated physiotherapy program was found to be both more effective and less costly on average compared to standard physiotherapy, with improved QALY of 0.13 and cost-saving at -£200 per patient. [11]
- A systematic review suggested that physiotherapy interventions for recipients of TKR were effective in improving physical function, ROM, and pain during short-term follow-up. Further studies are needed to examine the long-term effectiveness and cost-effectiveness of physiotherapy interventions.[5]

Low Back Pain

- Improved pain management, QALY, and time off work in the long-term.

- Exercise therapy led to lower costs and higher QALY compared with the usual care from healthcare perspective.

- A systematic review found that most cost-effectiveness studies showed physiotherapeutic interventions being cost-effective compared with a control group.[12]
- An RCT of three types of physiotherapy for people with chronic lower back pain improved pain management, quality of life and time off work.[4] Depending on the types of physiotherapy, time off work was reduced by 30-48% compared with baseline.
- A systematic review of people with non-specific neck and low back pain showed that exercise therapy was associated with lower costs and larger effects for QALY in comparison with usual care for subacute and chronic low back pain patients from a healthcare perspective. [3]

The Impact of Physiotherapy: Circulatory System Diseases

Evidence for the impact of physiotherapy for circulatory system diseases

Cardiac rehabilitation (CR) and stroke rehabilitation programs are collaborative interventions that integrate physical, psychosocial, and educational elements aimed at enhancing the recovery of individuals who have experienced a circulatory system event. The physiotherapist plays a crucial role in the exercise training and educational aspects of rehabilitation programs. Research on cost-effectiveness has shown that exercise-based rehabilitation programs are cost-effective and can even result in cost savings for people with coronary heart disease, stroke, heart failure, and other circulatory system diseases and conditions.

Summary of Evidence

- A systematic review evaluated the cost-effectiveness of CR in people with coronary heart disease, myocardial infraction, heart failure and other cardiovascular conditions found that physiotherapy intervention only or added to usual care improved health outcomes in almost all studies. The majority of studies concluded CR was cost-effective by reducing the risk of subsequent events and hospitalization, health care costs and improving QALYs.[13]

Coronary Heart Disease

- Exercise therapy, training, and exercise-based cardiac rehabilitation (CR) are effective in improving the health outcomes and quality of life in people with coronary heart disease (CHD). Meta-analyses and cost-effectiveness studies have shown that exercise-based CR significantly reduces the risk of cardiovascular mortality, hospitalization, and myocardial infarction, and is cost-saving or cost-effective compared to usual care.[14,15]

Heart Failure

- Exercise rehabilitation has a positive effect on people who have experienced chronic heart failure, improving their walk score, physical function, and quality of life. Economic evaluations have shown that exercise training provided by physiotherapists reduces inpatient days and the risk of high-cost inpatient procedures compared to usual care, with a lower total direct medical cost. Cost-effectiveness studies have also shown that supervised exercise therapy can improve QALYs, reduce hospitalization and mortality, and is cost-effective.[16-18]

Stroke

- Various types of exercise rehabilitation have been shown to improve physical functions in people who have experienced a stroke, including gait speed, walking ability, and muscle strength. Cost-effectiveness analyses of increased intensity physiotherapy, functional strength training, and extended stroke rehabilitation services have demonstrated cost-savings and improved quality of life for stroke patients in the long-term, with reduced length of stay and total costs.[19-21]

Reference:
See Appendix C – Literature Review Reference

The Impact of Physiotherapy: Circulatory System Diseases

Cost-effectiveness evidence for major diseases and conditions in circulatory system diseases

Coronary heart disease, heart failure and stroke are major prevalent diseases and conditions of circulatory system diseases that demonstrate relatively strong evidence of physiotherapy intervention. In this section, we present the detailed findings of research on the cost-effectiveness of physiotherapy.

Coronary Heart Disease

- Significantly reduced individual's cardiovascular mortality hospitalization and myocardial infarction (MI) event, with improved HRQoL and QALYs.

- Most studies showed cost-savings or cost-effectiveness for exercise-based CR.

- Systematic review of RCTs showed strong evidence for the effectiveness of exercise therapy, training and exercise-based CR in people with CHD. Most studies showed cost-effective results in improving patient health outcomes and QALY.[14]
- Meta-analysis of RCTs showed that exercise-based CR significantly reduced the individual's risk of cardiovascular mortality, hospitalization, and myocardial infarction and improved individual's HRQoL.[15]
- Most cost-effectiveness studies found that exercise-based CR were cost-saving or cost-effective with improved QALYs, when compared with usual care. Three studies showed cost-savings ranges from USD 415 to USD 2,378 per patient.[15]

Heart Failure

- Improved walk and physical function, health outcomes, quality of life and QALYs
- Reduced inpatient days and lower risk of high-cost procedures.

- Total direct medical costs per patient were lower by 9.5% in the intervention group compared to the usual care group.

- A systematic review of exercise rehabilitation on people with chronic heart failure showed positive effect on walk score, physical function, Minnesota Living with Heart Failure Questionnaire results, and QOL.[17]
- Economic evaluation of a 2.5-year RCT on exercise training provided by physiotherapists showed reduced inpatient days and lower risk of high-cost inpatient procedures compared with usual care. The total direct medical cost was 9.5% lower in the intervention group.[16]
- A cost-effectiveness study showed supervised exercise therapy can improve QALY, reduce hospitalization and mortality with a low cost. [18]

Stroke

- Various types of exercise rehabilitation Improved physical functions and QOL.
- Increased intensity of physiotherapy, functional strength training, and extended rehabilitation improved QALY.

- Increased intensity of physiotherapy and extended stroke rehabilitation showed cost-saving results in long-term.

- A systematic review of various types of exercise rehabilitation showed improvements in gait speed, walking ability, muscle strength, and other physical functions in people who had experienced stroke.[20]
- Cost-effectiveness analysis of increased intensity physiotherapy and functional strength training for stroke rehabilitation showed cost-savings and improved QALY in the long-term, with reduced length of stay in hospitals and reduced total costs.[19]
- Cost-effectiveness study of extended stroke rehabilitation services showed cost-saving results and improved QALY in the intervention group.[21]

Reference:
See Appendix C – Literature Review Reference

The Impact of Physiotherapy: Nervous System Diseases

Evidence for the impact of physiotherapy for nervous system diseases

Physiotherapy plays an important role in enhancing functional and quality of life outcomes for people with nervous system diseases. Various types of physiotherapy interventions help to reduce the risk of complications and improve physical functions, strength, fatigue symptoms, and overall quality of life. Physiotherapy interventions have the potential to be cost-effective for people with Parkinson's disease, multiple sclerosis, and other types of nervous system conditions.

Summary of Evidence

- A systematic review of physiotherapy interventions for neurological disorders found that aerobic training, progressive strength training, and a combination of stretching, strength, and balance training improved physical functions, strength, fatigue symptoms and QOLs. Physiotherapy interventions were potentially cost-effective for older adults with vascular cognitive impairment, falls prevention in Parkinson's disease, and multiple sclerosis.[22]

Parkinson's Disease

- A systematic review of physiotherapy interventions for Parkinson's disease found that conventional physiotherapy significantly improved motor symptoms, gait, and quality of life. Other interventions such as resistance training, treadmill training, and strategy training also showed improvements. Exercise interventions were found to reduce the risk of falls by 26% and improve health-related quality of life. Cost-effectiveness analyses showed that exercise programs were cost-effective with a small incremental cost per fall prevented and improved quality of life for people with Parkinson's disease.[23-26]

Multiple Sclerosis

- A review of rehabilitation interventions found that physical therapy can improve mobility, muscle strength, and quality of life, and reduce fatigue. Inpatient or outpatient multidisciplinary rehabilitation programs can lead to longer-term gains. A cost-effectiveness study showed that a pragmatic exercise intervention was likely to be cost-effective for people with multiple sclerosis, improving QALY.[27,28]

Concussion

- Occupational and physiotherapy interventions in concussion rehabilitation improved health outcome scores, post-concussion symptoms, physical function, pain, dizziness, and return to work time for patients. Another study showed that improving access to physical therapy resulted in increased utilization, reduced emergency medicine and imaging, and decreased median charges for concussion care.[29,30]

Alzheimer's Disease

- A systematic review of physiotherapy interventions in Alzheimer's disease showed significant changes in cognitive function scores, verbal fluency, time up and go test, Berg function balance scale, walk test, and other functional test scores.[31]

Spinal Cord Injury

- A systematic review of physiotherapy interventions in people with spinal cord injury showed potential effective improvement in wheelchair mobility, hand function, fitness, and pain.[32]

Reference:
See Appendix C – Literature Review Reference

The Impact of Physiotherapy: Nervous System Diseases

Cost-effectiveness evidence for major diseases and conditions in nervous system diseases

Parkinson's disease, multiple sclerosis and concussion are major prevalent diseases and conditions of nervous system diseases that demonstrate relatively strong evidence of physiotherapy intervention. In this section, we present the detailed findings of research on the cost-effectiveness of physiotherapy.

Parkinson's Disease

- Significantly improved motor symptoms, gait, physical functions and QOL.
- Effective in preventing falls and subsequent complications for people with mild Parkinson's disease.

- Cost-effective in fall prevention for people with mild to moderate Parkinson's disease.

- A systematic review of conventional and novel physiotherapy interventions found that conventional physiotherapy significantly improved motor symptoms, gait, and quality of life for people with Parkinson's disease. Additionally, other interventions such as resistance training, treadmill training, and strategy training showed improvements in various outcomes.[23]
- Review of interventions for preventing falls found that exercise intervention could reduce the risk of falls by 26% and slightly improve health-related quality of life immediately after the exercise intervention.[24]
- Cost-effectiveness analyses showed that exercise programs were cost-effective with a small incremental cost per fall prevented and improved QALY forpeople with Parkinson's disease.[25,26]

Multiple Sclerosis

- Physical therapeutic interventions improved mobility, muscular strength, fatigue and QOL.

- High probability of being cost-effective and improving individual's QALY.

- Review of various rehabilitation interventions found that physical therapeutic modalities (exercise and physical activities) can improve mobility, muscular strength, reduce fatigue, and improve quality of life. Inpatient or outpatient multidisciplinary rehabilitation programs can lead to longer-term gains in activity and participation. [27]
- Cost-effectiveness study on a RCT showed that pragmatic exercise intervention had a high probability of being cost-effective for people with multiple sclerosis, improving QALY.[28]

Concussion

- Improved scores measuring health outcomes, post-concussion symptoms, functions and improvement in the days to return to work.

- Improving access and utilization to physical therapy led to reduction in concussion care associated charges.

- A review of occupational and physiotherapy interventions in rehabilitation after a concussion found that health outcome scores, post-concussion symptoms, physical function, pain, dizziness, and days to return to work were improved.[29]
- A study on improving access to physical therapy led to an increase in utilization from 9% to 20%, resulting in significant reductions in subsequent emergency medicine and imaging and a 20.7% decrease in median charges associated with concussion care.[30]

Reference:
See Appendix C – Literature Review Reference

The Impact of Physiotherapy: Net Benefits

The net benefits of physiotherapy based on value of a statistical life year – evidence from the US and Australia

- The American Physical Therapy Association (APTA) and Australian Physiotherapy Association (APA) have both published estimates of the net benefits of physiotherapy for a variety of diseases. The net benefits were calculated as the difference between the benefit experienced by the individual receiving treatment and the net costs associated with the physiotherapy intervention, where the benefits were determined by measuring the improvement in the individual's quality of life (measured in QALY) and converting it to monetary values based on value of a statistical life year (VSLY).[1-5]
- The reports showed that physiotherapy interventions generate positive net benefits for a wide range of disease and conditions, ranging from AUD$1,320 (CAD$1,221) per patient for fall prevention to US$39,533 (CAD$53,372) per patient for carpal tunnel syndrome (see table at right).
- The net benefits were calculated based on research evidence and cost evaluations conducted in Australia and the United States. While the improvements in QALYs should be equivalent, healthcare system costs and VSLY values may differ in Canada. Therefore, further studies will be necessary to estimate the net benefits for Canadians and the healthcare system.
- Nonetheless, the evidence from these studies helps establish the cost-effectiveness of physiotherapy for common categories of disease. Combined with the results reported earlier in this section, it leads us to conclude that many physiotherapy interventions are not only effective; they are cost-effective, too.

Notes: Value of a Statistical Life Year (VSLY) is a measure used to estimate the monetary value of a one-year extension of a person's life expectancy resulting from a health intervention; The VSLY for the US was estimated to be USD$251,634 in 2022, and the VSLY for Australia is estimated to be AUD$227,000[1]; Net costs include all costs associated with physiotherapy intervention, minus the cost of any avoided care. Net costs may therefore be negative; Net Benefit of a patient is calculated based on the QALY gained times the VSLY minus the net costs. For example, when a patient gained 0.05 QALY more from a physiotherapy intervention and the cost is $10,000, based on the USD$251,634 VSLY, the patient's net benefit is 0.05*251,643-10,000 = USD$2,582.

1. American Physical Therapy Association (2023). The Economic Value of Physical Therapy in the United States. https://www.valueofpt.com/globalassets/value-of-pt/economic_value_pt_u.s._report_from_apta-report.pdf.
2. Australian Physiotherapy Association (2020). Value of Physiotherapy in Australia. https://australian.physio/sites/default/files/Report_FA_WEB.pdf.

Table 4: Research shows that physiotherapy interventions generate positive net benefits for a wide range of diseases and conditions

Estimates of net benefits of physiotherapy, by disease and country of study

Disease / Condition	Australia[1]	United States[2]
Osteoarthritis of the knee	-	USD$ 13,981
Osteoarthritis of the knee and hip	AUD$ 3,772	-
Back pain	AUD$ 6,063	USD$ 4,160
Chronic neck pain	AUD$ 3,416	-
Lateral epicondylitis (tennis elbow)	AUD$ 5,610	USD$ 10,739
Falls prevention	AUD$ 1,320	USD$ 2,144
Carpal tunnel syndrome	-	USD$ 39,533
Vascular Claudication	-	USD$ 24,125
Stress urinary incontinence	AUD$ 16,814	USD$ 10,129
Cancer rehabilitation		USD$ 3,514
Parkinson's disease (over 10 weeks)	AUD$ 6,626	-
Chronic Obstructive Pulmonary Disease (over two years)	AUD$ 2,436	-
Orthopaedic outpatient services	AUD$ 9,798	-
Emergency department services	AUD$ 24,028	-
Cerebral palsy in children	AUD$ 1,502	-

Source: American Physical Therapy Association, Australian Physiotherapy Association

The Impact of Physiotherapy

Section summary

1. Physiotherapy has been proven to be a successful method for enhancing health results in people with musculoskeletal diseases and injuries. Studies have demonstrated that people living with osteoarthritis, joint arthroplasty, chronic pain, injuries, and other musculoskeletal conditions can benefit from physiotherapy interventions. Many of these interventions have improved QALYs for individuals, and are cost-effective, leading to greater health and economic benefits.

2. Cardiac and stroke rehabilitation programs are collaborative interventions that aim to improve the recovery of individuals who have experienced a circulatory system event by integrating physical, psychosocial, and educational elements. Physiotherapists play a critical role in the exercise training and educational aspects of these programs. Studies have shown that exercise-based rehabilitation programs are cost-effective and can even lead to cost savings for people with coronary heart disease, stroke, and other circulatory system diseases and conditions.

3. Physiotherapy is effective in improving the quality of life and functional outcomes for many people with nervous system diseases. Different physiotherapy interventions can minimize the risk of complications and enhance physical functioning, strength, and overall quality of life. These interventions have the potential to be cost-effective for people with conditions such as Parkinson's disease, multiple sclerosis, and other nervous system diseases.

4. Research evidence and cost evaluations conducted in Australia and the United States show that physiotherapy not only improves QALYs, but it can also generate net benefits for a wide range of diseases and conditions based on VSLYs, ranging from a gain of AUD$1,320 (CAD$1,221) per patient for fall prevention to USD$39,533 (CAD$53,372) per patient for carpal tunnel syndrome. Further studies will be necessary to estimate the net benefits for Canadians and the healthcare system.

5. In addition to the disease categories of focus, there is research evidence physiotherapy is, or has the potential to be, cost-effective in improving individuals' health outcomes in the diseases and conditions such as respiratory conditions, mental health, stress and postnatal urinary incontinence, and long COVID.[33-37] Additional research is needed to further investigate the cost-effectiveness of physiotherapy interventions for people with these types of conditions.

Reference:
See Appendix C – Literature Review Reference

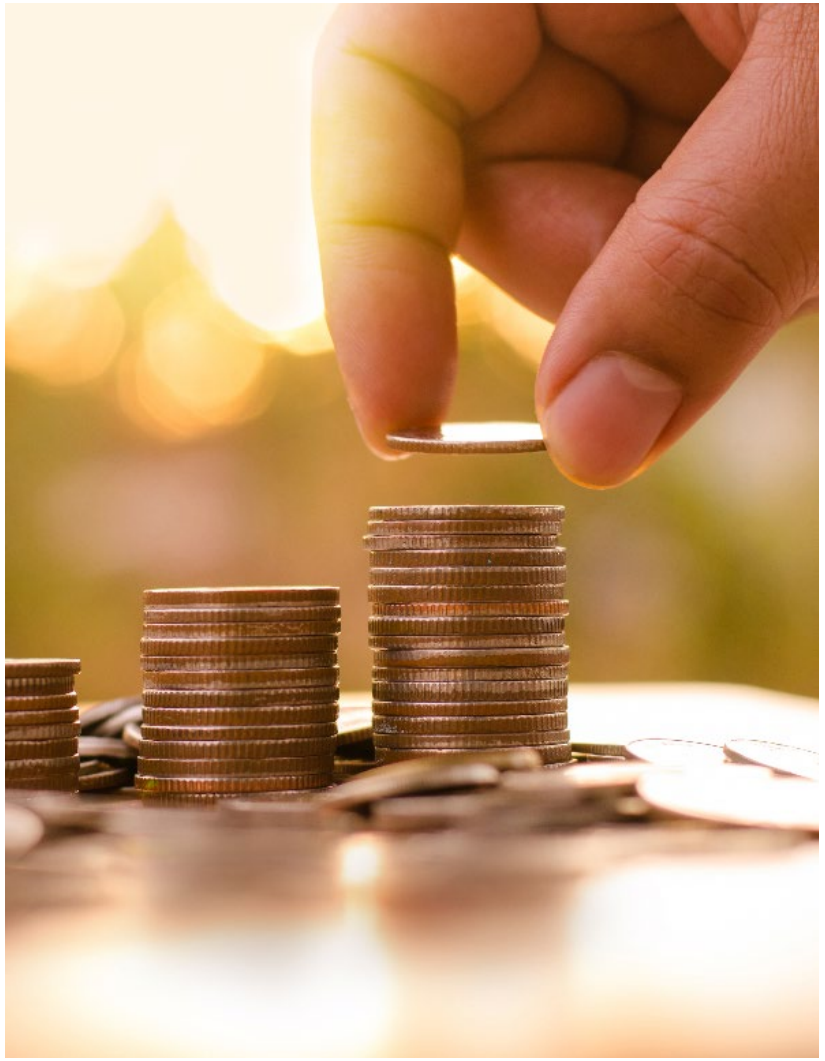
Economic Impact of Physiotherapy

Chapter 4

Economic Impact of Physiotherapy

Assessing the impact of physiotherapy on the economic burden of illness

- After collecting evidence on the magnitude of the impact of physiotherapy, the next step is to use those results to model physiotherapy's impact on the economic burden of illness in Canada.
- We conduct a scenario analysis to assess the impact of physiotherapy on the economic burden of illness for three diseases of focus within the broader disease categories we focus on in this research. We focus on detailed diseases rather than broad categories as it allows us to accurately use the evidence we found in the previous chapter.
- **In this chapter, our diseases of focus are osteoarthritis of the hip and knee, back pain, and coronary heart disease**. These are diseases that affect a significant portion of the Canadian population and are associated with significant direct and indirect costs. At the end of this section, we step back and examine what our results mean for our broader categories of disease.
- To evaluate the potential impact of physiotherapy on these diseases, we looked at three scenarios: a Current Scenario, an Improved Access Scenario, and an Ideal Access Scenario:
    1) The **Current Scenario** estimated the current cost-savings under the status quo, based on a comparison with a hypothetical scenario where physiotherapy is unavailable in Canada.
    2) The **Improved Access Scenario** estimates the impact on the burden of illness if access to physiotherapy were to grow again by the same rate at which it has grown over the past decade. In the past ten years, the number of physiotherapists per 1,000 population in Canada has expanded by 26%; we apply that same growth to the current level of service for this scenario.
    3) The **Ideal Access Scenario** estimates the impact on the burden of illness if the density of physiotherapists in Canada were brought up to the OECD average. Canada has 0.68 physiotherapists per 1,000 population, while the average OECD country has 1.10 per 1,000 population. The results of the Ideal Access Scenario will demonstrate the potential economic impact of physiotherapy if significant efforts were made to increase the supply of physiotherapists to bring Canada into line with peer countries.
- By comparing the economic outcomes of these scenarios, the chapter aimed to illustrate the potential cost-saving impact of improving access to physiotherapy on the economic burden of illness for these diseases.

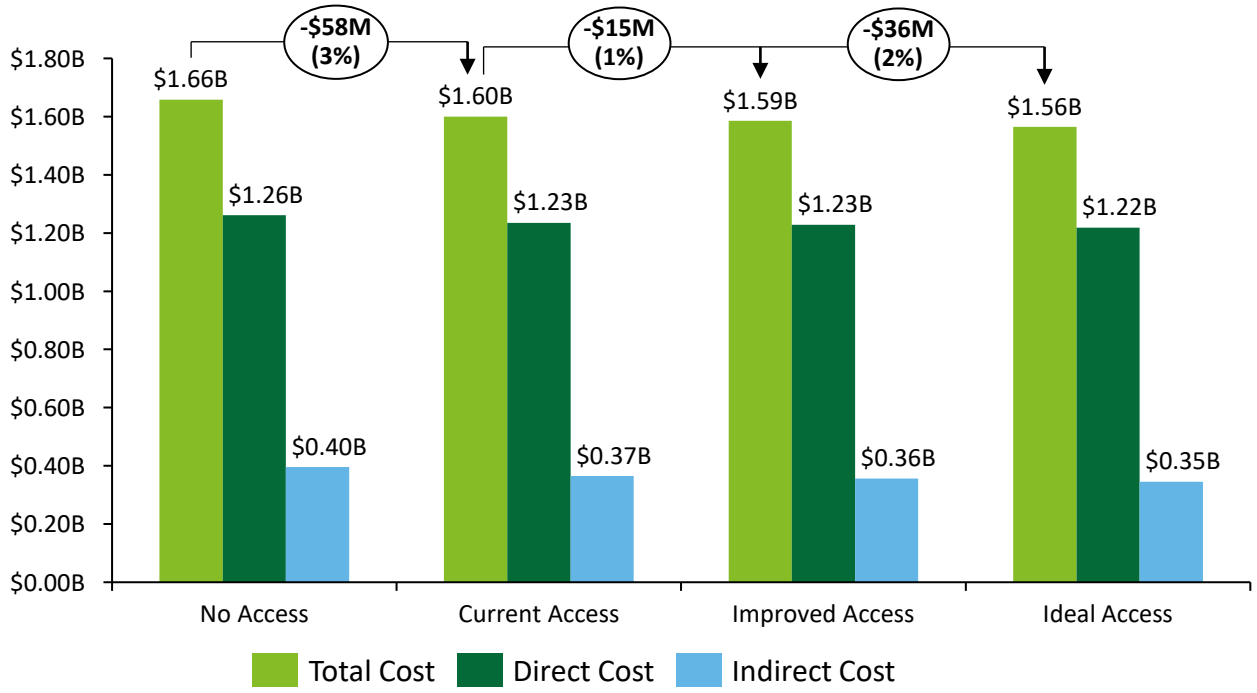


Economic Impact of Physiotherapy: Osteoarthritis of Hip and Knee

Case I: Osteoarthritis of Hip and Knee

Chart 19: Improved access to physiotherapy could reduce economic burden of osteoarthritis by $36 million

Economic burden of osteoarthritis under physiotherapy access scenarios, 2022 (estimate)



2022e: estimated amount based on 2022 estimation of current economic burden of illness.

Chart source: PHAC, CIHI, CCHS, Deloitte analysis

Notes: Total economic burden of illness include both direct and indirect costs; Current physiotherapy access percentage was estimated using data from the Canadian Community Health Survey (CCHS).

Current Reduction in Burden **$58M**

Further Reduction in Burden with Improved Access **-$15M**

Further Reduction in Burden with Ideal Access **-$36M**

In Canada, the current economic burden of osteoarthritis of the hip and knee is **$1.6 billion**, which comprises 11.1% of the burden of all musculoskeletal system diseases.

Under the current scenario, where 21% of people with osteoarthritis have access to physiotherapy intervention, the analysis showed that physiotherapy intervention saved **$58 million, which is equivalent to 3%** of the total burden of osteoarthritis of the hip and knee per year.

Improving physiotherapy access to the Improved Access scenario means 26% of people with osteoarthritis now receive physiotherapy. This level of access has the potential to further reduce the economic burden of illness by **$15 million (1%)** compared to the status quo. The sensitivity analysis indicated that the findings varied between $12 million to $18 million (see Appendix - Sensitivity Analysis).

Furthermore, improving physiotherapy access to the Ideal Access scenario of 34% could potentially reduce the economic burden of illness by **$36 million (2%)** per year compared to the status quo. The sensitivity analysis indicated that the findings varied between $28 million to $43 million (see Appendix - Sensitivity Analysis).

Economic Impact of Physiotherapy: Osteoarthritis of Hip and Knee

What does this mean for Canadians suffering from osteoarthritis?

Osteoarthritis

Indira

- Indira has had osteoarthritis for a few years. She suffers from stiffness and swelling in her joints when she wakes up in the morning and feels aches and pains after she has been playing with her grandchildren.
- Indira takes over-the-counter pain relievers and corticosteroids to reduce swelling. But when her aches and pains flare up, she sometimes has to take time off work.
- Indira has talked to her doctor, and they are waiting for an appointment for further diagnostics to find out whether Indira is a good candidate for surgery. However, the wait time for the diagnostics and surgery are both very long.
- In the meantime, Indira has started seeing a physiotherapist. The therapy has helped her improve her flexibility and reduce the pain she feels. Since beginning physiotherapy, Indira has not had to take as many days off work.
- Taking less time off work means Indira does not miss out on wages, which she appreciates because it lets her keep her retirement plan on track.
- Depending on the specifics of her case, therapy may also alleviate the need for Indira to have expensive surgery.

Direct savings to the health care system:

- **Current access: $27M**
- **Improved access: +$7M**
- **Ideal access: +$17M**

Note: Improved access and ideal access cost reductions are compared to the current access scenario.

As we see in Indira's case, physiotherapy can help reduce pain and swelling for people with osteoarthritis. For some individuals, this may alleviate the need for expensive drugs and surgical interventions. These represent the reductions in the direct cost burden of this illness. In our estimation, physiotherapy is already saving the health care system $27 million per year across all Canadians with osteoarthritis. With improved physiotherapy access, this could further reduce the current burden by $7 million. And with ideal access, this could further reduce the current burden by $17 million.

Indirect savings to the economy:

- **Current access: $31M**
- **Improved access: +$8M**
- **Ideal access: +$19M**

Note: Indirect cost include productivity loss due to morbidity, premature mortality and informal care costs.

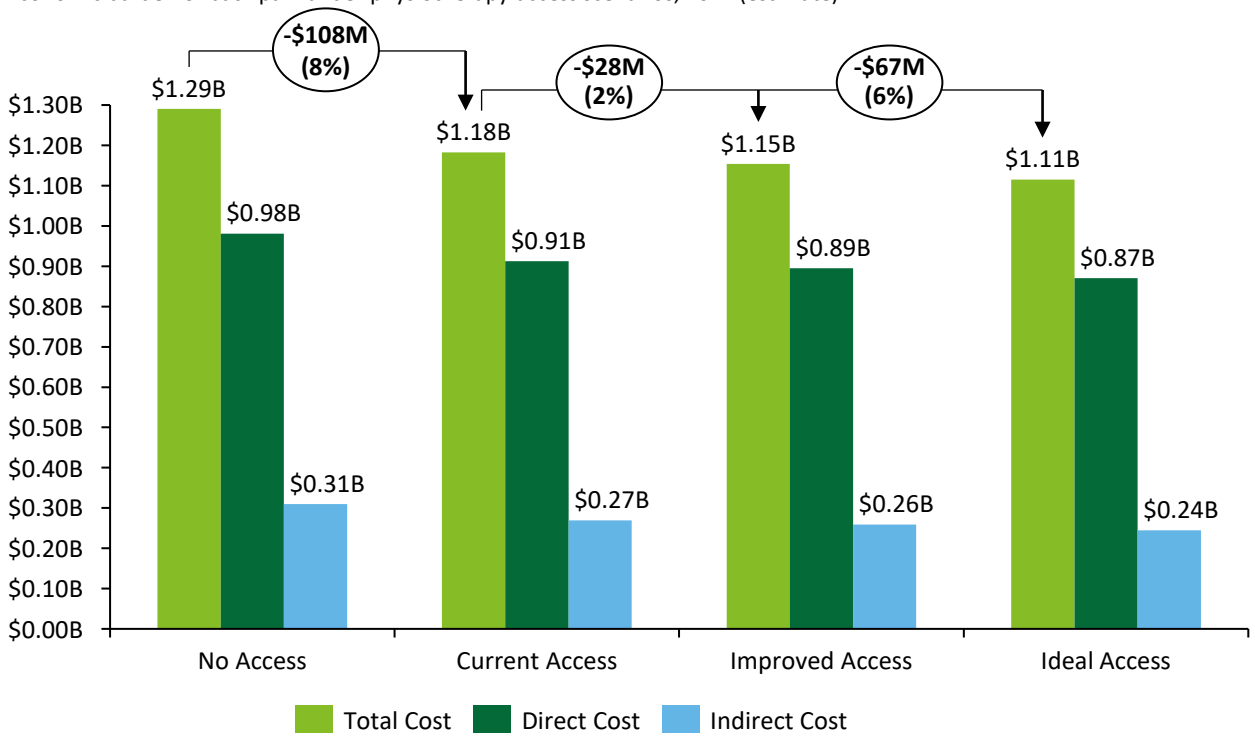
The benefits extend beyond the health care system. Physiotherapy can help some people with osteoarthritis take less time off work, meaning they miss out on less wages and their employers don't have to reduce output. With current levels of physiotherapy care, Canadians with osteoarthritis and their employers are already benefiting to the tune of $31 million dollars per year. With improved physiotherapy access, this could further reduce the current burden by $8 million. And with ideal access, this could further reduce the current burden by $19 million.

Economic Impact of Physiotherapy: Back Pain

Case II: Back Pain

Chart 20: Improved access to physiotherapy could reduce economic burden of back pain by $67 million

Economic burden of back pain under physiotherapy access scenarios, 2022 (estimate)



2022e: estimated amount based on 2022 estimation of current economic burden of illness.

Chart source: PHAC, CIHI, CCHS, Deloitte analysis

Notes: Total economic burden of illness include both direct and indirect costs; Current physiotherapy access percentage was estimated using data from the Canadian Community Health Survey (CCHS).

Current Reduction in Burden **$108M**

Further Reduction in Burden with Improved Access **-$28M**

Further Reduction in Burden with Ideal Access **-$67M**

In Canada, the current economic burden of back pain is **$1.2 billion**, which comprises 8.2% of the total burden of musculoskeletal system diseases.

Under the current scenario, where 35% of people with back pain have access to physiotherapy intervention, the analysis showed that physiotherapy intervention saved **$108 million (8%)** of the total burden of back pain per year.

Improving physiotherapy access to the Improved Access scenario means 44% of people with back pain now receive physiotherapy. This level of access has the potential to further reduce the economic burden of illness by **$28 million (2%)** compared to the status quo. The sensitivity analysis indicated that the findings varied between $22 million to $34 million (see Appendix - Sensitivity Analysis).

Furthermore, improving physiotherapy access for people with back pain to the Ideal Access scenario of 56% could potentially reduce the economic burden of illness by **$67 million (6%)** per year compared to the status quo. The sensitivity analysis indicated that the findings varied between $53 million to $82 million (see Appendix - Sensitivity Analysis).

Economic Impact of Physiotherapy: Back Pain

What does this mean for Canadians suffering from back pain?

Back Pain

Kate

- Kate has been suffering from low back pain for a few years, experiencing stiffness and discomfort in her lower back upon waking up in the morning, and aches and pains after prolonged sitting.
- To alleviate his discomfort, Kate resorts to over-the-counter pain relievers. However, her pain sometimes flares up, causing her to take time off work.
- Kate has consulted with her doctor, and they are exploring different treatment options, but the wait time for some of these treatments is long.
- Meanwhile, Kate has started seeing a physiotherapist, and the therapy has significantly improved his symptom, physical functions, and reduced her pain.
- As a result, Kate has not had to take as many days off work, which is beneficial in terms of maintaining her income. Additionally, depending on the specifics of her case, physiotherapy may reduce her use of medicine, wait time of seeing a specialist, and related healthcare costs.

Direct savings to the health care system

- **Current access: $68M**
- **Improved access: +$18M**
- **Ideal access: +$42M**

Note: Improved access and ideal access cost reductions are compared to the current access scenario.

As we see in Kate's case, physiotherapy can help reduce pain and improve physical function for people with back pain. For some individuals, this may alleviate the need for expensive drugs and other medical interventions. These represent the reductions in the direct cost burden of this illness. In our estimation, physiotherapy is already saving the health care system $68 million per year across all Canadians with back pain. With improved physiotherapy access, this could further reduce the current burden by $18 million. And with ideal access, this could reduce the current burden by $42 million.

Indirect savings to the economy:

- **Current access: $40M**
- **Improved access: +$10M**
- **Ideal access: +$25M**

Note: Indirect costs include productivity loss due to morbidity, premature mortality and informal care costs.

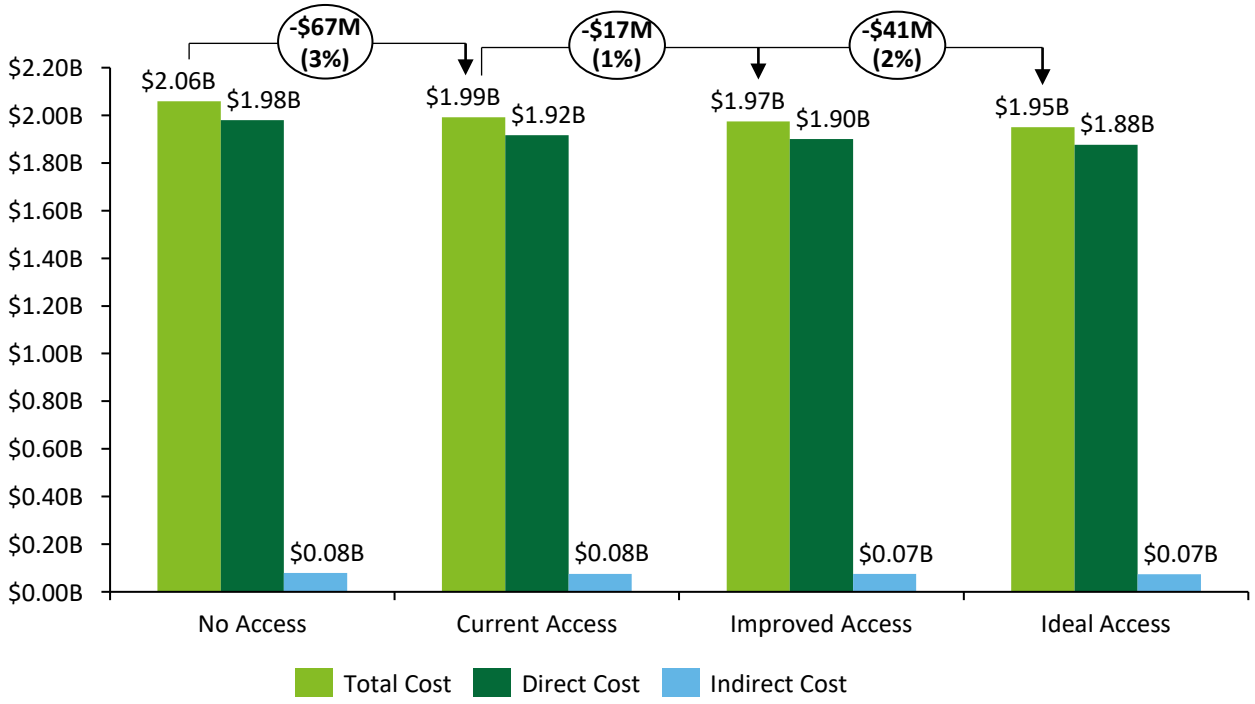
The benefits extend beyond the health care system. Physiotherapy can help some people with back pain take less time off work, meaning they miss out on less wages and maintain productivity. With current levels of physiotherapy care, Canadians with back pain and their employers are already benefiting to the tune of $40 million dollars per year. With improved physiotherapy access, this could further reduce the current burden by $10 million. And with ideal access, this could reduce the current burden by $25 million.

Economic Impact of Physiotherapy: Coronary Heart Disease

Case III: Coronary Heart Disease

Chart 21: Improved access to physiotherapy could reduce economic burden of heart diseases by $41 million

Economic burden of coronary heart disease under physiotherapy access scenarios, 2022 (estimate)



2022e: estimated amount based on 2022 estimation of current economic burden of illness.

Chart source: PHAC, CIHI, CCHS, Deloitte analysis

Notes: Total economic burden of illness include both direct and indirect costs; Current physiotherapy access percentage was estimated using data from the Canadian Community Health Survey (CCHS).

Current Reduction in Burden **-$67M**

Further Reduction in Burden with Improved Access **-$17M**

Further Reduction in Burden with Ideal Access **-$41M**

In Canada, the current economic burden of coronary heart disease is **$2.0B**, which comprises 8.9% of the total burden of circulatory system diseases.

Under the current scenario, where 14% of people with heart disease have access to physiotherapy intervention, the analysis showed that physiotherapy intervention saved **$67 million (3%)** of the total burden of coronary heart disease per year.

Improving physiotherapy access to the Improved Access scenario means 18% of people with coronary heart disease now receive physiotherapy. This level of access has the potential to further reduce the economic burden of illness by **$17 million (1%)** compared to the status quo. The sensitivity analysis indicated that the findings varied between $14 million to $21 million (see Appendix - Sensitivity Analysis).

Furthermore, improving physiotherapy access for people with coronary heart disease to the Ideal Access scenario of 23% could potentially reduce the current economic burden of illness by **$41 million (2%)** per year compared to the status quo. The sensitivity analysis indicated that the findings varied between $33 million to $50 million (see Appendix - Sensitivity Analysis).

Economic Impact of Physiotherapy: Coronary Heart Disease

What does this mean for Canadians suffering from coronary heart disease?

Coronary Heart Disease

Robert

- Robert has been diagnosed with coronary heart disease and has been experiencing symptoms like chest pain and shortness of breath. He has been prescribed medication to manage his symptoms, but he is concerned about the impact of his condition on his daily life and overall health outcomes.
- Besides usual medical care, Robert enrolled in a cardiac rehabilitation program that includes physiotherapy to help him improve his symptoms and reduce the risk of future cardiac events.
- Since starting the program, Robert has noticed improvements in his ability to perform daily activities and has experienced fewer episodes of chest pain. He has also learned about the importance of exercise and healthy lifestyle choices in managing his condition.
- Participating in the program has not only improve Robert's cardiac symptoms, but it has also reduced his risk of hospitalization and premature mortality.

Direct savings to the health care system:

- **Current access: $64M**
- **Improved access: +$17M**
- **Ideal access: +$40M**

Note: Improved access and ideal access cost reductions are compared to the current access scenario.

As we see in Robert's case, a cardiac rehabilitation program with physiotherapy can help reduce the risk of complications and mortality for people with coronary hearth disease. For some individuals, this may alleviate the need for expensive hospitalization. These represent the reductions in the direct cost burden of this illness. In our estimation, physiotherapy is already saving the health care system $64 million per year across all Canadians with coronary heart disease. With improved physiotherapy access, this could further reduce the current burden by $17 million. And with ideal access, this could further reduce the current burden by $40 million.

Indirect savings to the economy:

- **Current access: $3M**
- **Improved access: +$0.6M**
- **Ideal access: +$1.8M**

Note: Indirect costs include productivity loss due to morbidity, premature mortality and informal care costs.

The benefits extend beyond the health care system. Physiotherapy can help to reduce premature mortality and avoid hospitalization, reducing the indirect cost burden to the individual and their family. With current levels of physiotherapy care, Canadians with coronary heart disease and their informal care givers are already benefiting to the tune of $3 million dollars per year. With improved physiotherapy access, this could further reduce the current burden by $0.6 million. And with ideal access, this could further reduce the current burden by $1.8 million.

Economic Impact of Physiotherapy

Improving access to physiotherapy for Canadians has the potential to further reduce the economic burden of diseases.

1. The economic burden of **osteoarthritis of hip and knee** is estimated to be $1.6 billion, accounting for 11.1% of the total musculoskeletal disease and injury burden. Currently, 21% of Canadians with osteoarthritis access physiotherapy treatments. By increasing the availability of physiotherapists in line with the OECD average, 34% of people with osteoarthritis could receive physiotherapy and the economic burden of this illness could be reduced by $36M (2%). If future research finds similar impacts across other types of musculoskeletal disease and injury, the total burden of illness could be reduced by as much as $324 million per year.

2. The economic burden of **back pain** is estimated to be $1.2 billion, accounting for 8.2% of the total musculoskeletal disease burden. Currently, 35% of Canadians with back pain access physiotherapy treatments. By increasing the availability of physiotherapists in line with the OECD average, 44% of people with back pain could receive physiotherapy and the economic burden of this illness could be reduced by $67 million (6%). If future research finds similar impacts across other types of musculoskeletal disease and injury, the total burden of illness could be reduced by as much as $817 million per year.

3. The economic burden of **coronary heart disease** is estimated to be $2.0 billion, accounting for 8.9% of the total circulatory system disease burden. Currently, 14% of Canadians with heart disease have access to physiotherapy intervention. By increasing the availability of physiotherapists in line with the OECD average, 23% of people with heart disease could receive physiotherapy and the economic burden of this illness could be reduced by $41M (2%) per year. If future research finds similar impacts across other types of circulatory disease, the total burden of illness could be reduced by as much as $461 million per year.

Table 5: Summary of modeling results shows impact of physiotherapy across all diseases and scenarios

Current economic burden of illness and estimate reduction in three scenarios, by disease

	Total Economic Burden of Illness (% in the Disease Category)	Current Status Scenario $ Reduction in Burden of Illness (% of Burden Reduced vs No Access Scenario)	Improved Access Scenario $ Reduction in Burden of Illness (% of Burden Reduced vs Current Access Scenario)	Ideal Access Scenario $ Reduction in Burden of Illness (% of Burden Reduced vs Current Access Scenario)
Osteoarthritis of Hip and Knee	$1.6B (11.1%)	$58M (3%)	$15M (1%)	$36M (2%)
Back Pain	$1.1B (8.2%)	$108M (8%)	$28M (2%)	$67M (6%)
Coronary Heart Disease	$2.0B (8.9%)	$67M (3%)	$17M (1%)	$41M (2%)

Table source: PHAC, CIHI, CCHS, Deloitte analysis

Notes: Current Access Reduction refers to estimated cost saving comparing with estimated no physiotherapy access scenario; The Improved Access Scenario estimates the burden of illness when access to physiotherapy is expanded by 26%, if current growth of physiotherapist per 1,000 population continue for the next decade.[1] The Ideal Access Scenario estimates the burden of illness when access to physiotherapy is expanded by 62%, based on taking Canada to the OECD average in terms of physiotherapists per 1,000 population. [1]

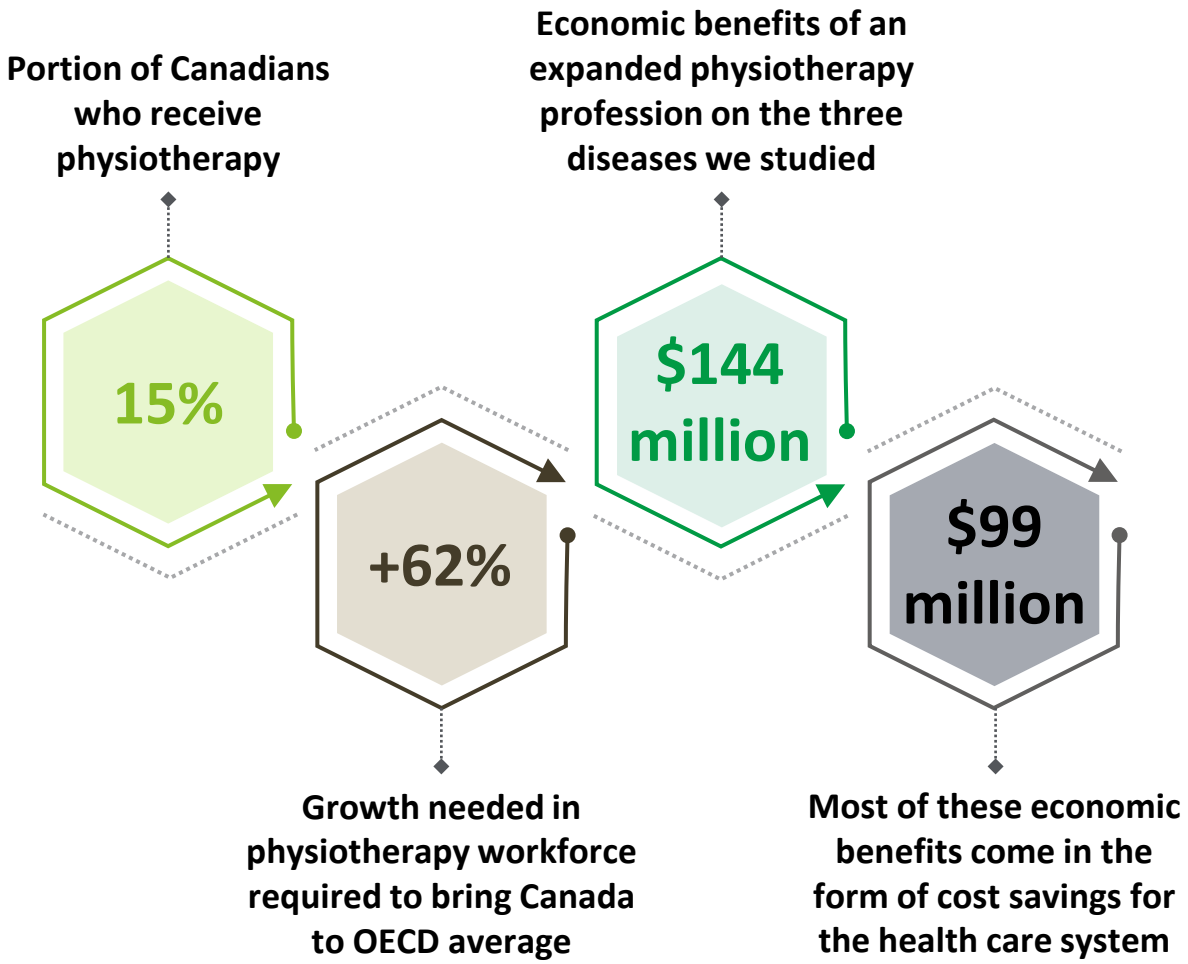
1. OECD. Healthcare Resources : Physiotherapists. https://stats.oecd.org/index.aspx?DataSetCode=HEALTH_REAC. (Accessed December 12, 2023).

Conclusion and Key Takeaways

Conclusion

What do our results mean for the burden of illness?

- Currently, **15% of Canadians receive physiotherapy treatments each year**.
- With this current level of coverage, **physiotherapy is already reducing the burden of illness in Canada by $232 million (5%) per year**. But there is further room to improve.
- Canada has fewer physiotherapists per capita than most other developed countries. **We would need to increase the number of practicing physiotherapists by 62% to bring Canada up to the OECD average** of 1.1 physiotherapists per 1,000 population.
- We estimated the economic impact of bringing Canada up to the OECD average. We found that doing so would result in considerable savings for the health care system and a positive impact on productivity and worker income.
- For the three diseases we studied in detail, **we estimate that bringing Canada to the OECD average would result in a $144 million reduction in the economic burden of illness**.
- Most of these benefits come in the form of direct cost savings. **Physiotherapy can reduce spending on hospital stays, medical appointments, diagnostics, treatments, and drugs within the health care system by $99 million**.
- Not all illnesses will respond to physiotherapy to the same degree, particularly given that we have focused on illnesses where we expected physiotherapy to be particularly effective and where research already exists. However, **the illnesses we have looked at here represent just 5% of the overall burden of disease in Canada. If the other 95% of illnesses respond similarly to the diseases we have studied here, the total economic burden of illness from bringing Canada to the OECD could be measured in the billions of dollars**.
- We note that a reduction of the cost burden of illness does not imply a reduction in health care system spending. Rather, the healthcare resources that would have been used on the patients with these diseases can now be reallocated elsewhere, further reducing the burden of illness across other diseases.



What's Possible

Getting Canadian physiotherapy to the OECD average requires growing the profession significantly. Is that actually feasible?

- We have seen that growing the number of physiotherapists in Canada can offer significant economic benefits and cost savings to the health care system.
- These modeling results are based on bringing the number of physiotherapists in Canada up to the OECD average. This represents a 62% increase from Canada's current number of physiotherapists per capita (0.68 physiotherapists per 1,000 population). This is a significant increase, and the obvious question is: is it actually feasible?
- From an international perspective, several peer countries have recently seen this kind of growth in their own physiotherapy professions. **Between 2012 and 2021, nine OECD countries have seen their physiotherapist density increase by at least 62%**: Austria, Chile, Greece, Hungary, Ireland, South Korea, Latvia, Lithuania, and Turkey (see chart 22).[1] This suggests that an increase of this magnitude is indeed possible.
- As discussed in chapter 1, the net number of physiotherapists in Canada is already projected to grow to 37,000 by 2031. Given our own forecasts of Canada's population growth, that would equate to 0.83 physiotherapists per 1,000 population – still well short of the OECD average.
- To bring Canada to the OECD average of 1.10 physiotherapists per 1,000 population by 2031, Canada would need a total of 48,939 physiotherapists.
- That means, **over the next decade, Canada would need to add nearly 12,000 new physiotherapists above and beyond the growth already anticipated for the profession**.
- Achieving this kind of growth will require collaboration between all stakeholders. New physiotherapy programs will need to be opened at additional universities to increase the number of physiotherapists who can be trained each year. More seats will need to be funded at Canada's 15 existing university physiotherapy programs. And Canada must credential more immigrant physiotherapists with international training and experience.

Chart 22: Peer countries have experience growing their physiotherapy professions rapidly

Number of physiotherapists per 1,000 population in selected OECD countries, change in levels and percentage change, 2012 to 2021

Austria
0.40 → 1.65
(*+313%*)

Turkey
0.04 → 0.09
(*+125%*)

Ireland
0.54 → 1.06
(*+96%*)

Lithuania
0.40 → 0.70
(*+75%*)

Greece
0.55 → 0.91
(*+65%*)

Chile
0.56 → 1.83
(*+227%*)

Hungary
0.30 → 0.64
(*+113%*)

Latvia
0.27 → 0.52
(*+93%*)

South Korea
0.51 → 1.09
(*+73%*)

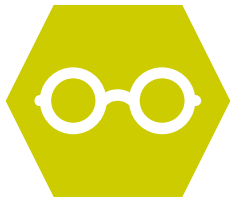
1. OECD. Healthcare Resources : Physiotherapists. https://stats.oecd.org/index.aspx?DataSetCode=HEALTH_REAC. (Accessed December 12, 2023).

Key Takeaways

Given the challenges Canada faces with health care cost inflation, policymakers and providers need to seek alternative ways to provide Canadians the care they deserve while carefully shepherding system resources. In this report, we have presented evidence that the use of physiotherapy interventions can significantly reduce the burden of illness. Below, the key highlights are summarized.

Illness costs Canada billions each year

The current economic burden of illness in Canada totals $236.3B, with 30% of that total attributable to three major categories of disease we have featured in this study: injuries and disorders of the musculoskeletal system; circulatory disorders; and neurological disorders.



Physiotherapy is effective at treating a wide variety of diseases

A review of the literature has shown that physiotherapy is cost-effective for many diseases, and results in faster recovery, reduced pain, fewer lost days of work, and cost savings to the healthcare system.

Physiotherapists will already be in short supply over the next decade

A shortage of physiotherapists is projected over the next decade. More effort needs to be made to ensure an adequate supply of therapists and improve access for all Canadians.

Canada lags peer countries in the number of physiotherapists per capita

We would need to increase the number of physiotherapists in Canada by 62% to bring ourselves to the OECD average of 1.1 physiotherapists per 1,000 population.

Expanding physiotherapy access could significantly reduce the burden of illness

Physiotherapy is currently lowering the annual economic burden of the diseases we studied by $232 million (5%). By expanding the supply of physiotherapy to the OECD average, there is potential to further reduce the burden of these diseases by $144 million (3%).

Other countries offer a blueprint for growth in this profession

It will be a big lift to increase the supply of physiotherapists by the amount outlined here. But over the past decade, nine OECD countries have already seen the kind of growth in the physiotherapy profession that Canada would need.

Areas For Future Research

Next steps for further exploring the potential of physiotherapy

This research has shown that physiotherapy interventions can be a cost-effective treatment for many conditions and thus help to reduce burgeoning cost pressures in the health care system. However, we encountered a variety of shortcomings in the existing data and evidence. We hope to see future research continue to fill in these gaps in knowledge.

EVIDENCE

Significantly more research is needed into the impact of physiotherapy on specific illnesses

While the existing body of research has established the effectiveness of physiotherapy for various diseases and conditions, there is a much smaller group of diseases where research has measured the effectiveness of physiotherapy interventions in a way that can support the kind of analysis undertaken in this study. More RCTs and cost-effectiveness studies on a broader range of diseases are therefore needed to explore the effectiveness of physiotherapy treatments and their economic impacts.

ACCESS TO CARE

Concrete steps to improve the percentage of Canadians receiving physiotherapy

Although physiotherapy is effective in improving health outcomes and reducing the burden of illness, the percentage of Canadians receiving physiotherapy is still relatively low. Barriers to physiotherapy access can include factors such as cost, location, and availability of services. Research is needed to identify these barriers and develop strategies to address them, and to find the most effective ways to educate individuals and healthcare providers about the benefits of physiotherapy and the importance of early intervention.

GROWING THE PROFESSION

Increasing the supply of physiotherapists

One of the key takeaways from this research is that, to realize the potential gains outlined in the previous pages, Canada will need to substantially expand the number of physiotherapy providers above and beyond current trends. Even in the status quo, 50% growth in the number of physiotherapists over the next decade will result in a shortage of practitioners compared to demand. To expand the number of Canadians who can receive physiotherapy, more work needs to be done on attracting and training the skilled professionals needed.

PAYER

The role of public and private payers in physiotherapy

As we mentioned in the first chapter, there is no consistent data on the total amount spent on physiotherapy by private payers, whether through health insurance claims or out-of-pocket. More research is needed into how the cost burden of physiotherapy is shared in Canada – particularly in light of the fact that many of the cost savings flow to the public sector.

Appendix A

Literature Review Reference

Literature Review |Impact of Physiotherapy (1/2)

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Appendix B

Economic Impact of Physiotherapy

Sensitivity Analysis

Economic Impact of Physiotherapy | Sensitivity Analysis (1/3)

Case I: Osteoarthritis of Hip and Knee

Sensitivity analysis was conducted to determine uncertainties in the input variables of the economic impact model. Each of the following variables were decreased or increased by 20% to generate the low and high values of outputs.

1. Effectiveness of physiotherapy intervention on direct costs
2. Effectiveness of physiotherapy intervention on indirect costs

Results (Lower Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$1,646M	$1,256M	$390M		-$46M	-$58M	-$74M
Current Access	$1,600M	$1,235M	$365M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,588M	$1,229M	$359M			-$12M	-$28M
Ideal Access	$1,572M	$1,222M	$350M				

Results (Upper Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$1,670M	$1,267M	$403M		-$70M	-$88M	-$114M
Current Access	$1,600M	$1,235M	$365M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,582M	$1,227M	$355M			-$18M	-$43M
Ideal Access	$1,557M	$1,215M	$341M				

Economic Impact of Physiotherapy | Sensitivity Analysis (2/3)

Case II: Back Pain

Sensitivity analysis was conducted to determine uncertainties in the input variables of the economic impact model. Each of the following variables were decreased or increased by 20% to generate the low and high values of outputs.

1. Effectiveness of physiotherapy intervention on direct costs
2. Effectiveness of physiotherapy intervention on indirect costs

Results (Lower Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$1,267M	$966M	$301M		-$85M	-$107M	-$137M
Current Access	$1,182M	$912M	$270M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,160M	$898M	$262M			-$22M	-$53M
Ideal Access	$1,129M	$879M	$250M				

Results (Upper Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$1,315M	$995M	$319M		-$133M	-$167M	-$215M
Current Access	$1,182M	$912M	$270M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,148M	$891M	$257M			-$34M	-$82M
Ideal Access	$1,100M	$861M	$239M				

Economic Impact of Physiotherapy | Sensitivity Analysis (3/3)

Case III: Coronary Heart Disease

Sensitivity analysis was conducted to determine uncertainties in the input variables of the economic impact model. Each of the following variables were decreased or increased by 20% to generate the low and high values of outputs.

1. Effectiveness of physiotherapy intervention on direct costs
2. Effectiveness of physiotherapy intervention on indirect costs

Results (Lower Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$2,045M	$1,967M	$78M		-$53M	-$67M	-$86M
Current Access	$1,992M	$1,917M	$75M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,978M	$1,903M	$75M			-$14M	-$33M
Ideal Access	$1,959M	$1,885M	$74M				

Results (Upper Range)

	Total Costs	Direct Costs	Indirect Costs		Saving (status quo)	Saving(Scenario A - no PT)	Saving(Scenario B - no PT)
W/O Physiotherapy	$2,073M	$1,994M	$79M		-$80M	-$101M	-$130M
Current Access	$1,992M	$1,917M	$75M			**Saving(Scenario A - current)**	**Saving(Scenario B - current)**
Improved Access	$1,971M	$1,897M	$75M			-$21M	-$50M
Ideal Access	$1,942M	$1,869M	$73M				

Appendix C

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Sources

Data Source		Link
Direct Costs and Indirect Costs by Diagnostic Categories in Canada	Public Health Agency of Canada, Economic Burden of Illness in Canada (EBIC)	Economic Burden of Illness in Canada
Prevalence of Chronic Diseases in Canada	Canadian Chronic Disease Surveillance System (CCDSS)	Canadian Chronic Disease Surveillance System (CCDSS) (canada.ca)
Health Spending in Canada	The National Health Expenditure Database (NHEX)	National Health Expenditure Database metadata | CIHI
Number of Physiotherapists in Canada	Canadian Institute for Health Information, Health workforce: Physiotherapists	Physiotherapists | CIHI
Access to Physiotherapy	Statistics Canada, Canadian Community Health Survey Public Use Microdata	Canadian Community Health Survey - Canada.ca
International Physiotherapy Density	Organization for Economic Cooperation and Development, Healthcare Resources: Physiotherapists	Healthcare Resources (oecd.org)

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