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Analysis in Brief

The Canadian Research and Development Pharmaceutical Sector, 2023

by Greg Maloney, Mohammad Huda and Norma Abou-Eid

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Note of appreciation

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The Canadian Research and Development Pharmaceutical Sector, 2023

by **Greg Maloney, Mohammad Huda** and **Norma Abou-Eid**

Background

This study is part of a series commissioned by Innovative Medicines Canada (IMC)[1] to evaluate the economic footprint of the Canadian research and development pharmaceutical sector in the national economy. The analysis covers data from 2018 to 2023, with particular emphasis on the 2023 reference year. The report provides two distinct perspectives: the first examines the economic contribution of the entire sector on the Canadian economy, while the second specifically assesses the contribution of IMC association members.

The sector's economic footprint is analyzed through several concepts, including direct, indirect, and induced economic effects, as well as measures related to employment, trade, and research and development (R&D). R&D measurement in this study series follows international standards outlined in the Frascati Manual by the Organisation for Economic Co-operation and Development.

In 2023, value added for the Canadian R&D pharmaceutical industry declined from $18.4 billion in the previous year to $18.1 billion. Other key metrics also decreased, such as operating profits, down 23.8% to $230 million, and employment, down 6.2% to 103,964 full-time equivalent (FTE) jobs in 2023.

All studies in this series have been conducted independently by Statistics Canada, covering variable selection, data processing, analysis, and public release.

1 Introduction

This publication marks the sixth edition in a series commissioned by Innovative Medicines Canada (IMC), beginning with the 2018 reference year, that evaluates the economic contributions of Canada's research and development pharmaceutical sector[2] to the national economy. The current study centers on data from 2023 and integrates findings across several key areas, including direct, indirect, and induced economic impacts; employment; international trade; and research and development activities. The report offers two distinct perspectives: one detailing the overall influence of the sector on the Canadian economy, and another providing a comprehensive analysis of the specific economic contributions made by IMC association members as compared to non-members.

The sector, as defined in this report, is confined to a particular segment of the pharmaceutical industry, specifically branded pharmaceutical and medicine manufacturing, pharmaceutical and pharmacy supplies merchant wholesaling, and research and development (R&D) in the physical, engineering, and life sciences. This grouping was selected to align with the study's objective of analyzing R&D investments and innovation patterns by businesses in sectors most directly associated with branded pharmaceuticals.[3]

The study population has stayed consistent over the years, with around 200 businesses forming the core group for sector-wide analysis. Likewise, segmented reviews of association members have included roughly 50 units each time. This continued stability in both groups helps ensure that the results are comparable and reliable over the period studied.

1. More information on Innovative Medicines Canada can be found at www.innovativemedicines.ca.
2. The term "research and development pharmaceutical sector" used in this report is not an official designation within the North American Industry Classification System (NAICS). The name was chosen based on the companies' reported R&D activities and their classification within pharmaceutical-related NAICS codes identified in this study.
3. Businesses primarily engaged in medical devices, generic pharmaceuticals, or veterinary medicines were excluded since their market structures, regulatory environments, and R&D profiles differ significantly from those of branded pharmaceutical firms. These exclusions ensure analytical consistency and comparability within the target segment.

About the study series

This series of studies delivers a thorough, data-driven assessment of the Canadian pharmaceutical research and development sector, starting with reference year 2018. Each report commences with an analysis at the sector level and subsequently examines the contribution of IMC member companies in comparison to non-member organizations, offering further context.

Statistics Canada has maintained independent control over all aspects of this study and the series itself, including the design, analysis, and dissemination of results.

2 The Canadian research and development pharmaceutical sector

2.1 Economic footprint

2.1.1 Value added

The importance of a sector within the economy can be assessed by examining its output and gross value added (GVA).

Value added shows how much a sector contributes to Gross Domestic Product (GDP) by measuring the **new** value created during production, after subtracting the cost of goods and services used in the process. As a key part of GDP, Gross Value Added (GVA) provides a consistent and generally accepted measure of economic impact.

GVA contributions can be divided into three distinct components. **Direct impacts** capture the value created by the sector's own production. **Indirect impacts** measure the value generated by suppliers that provide goods and services to the sector. **Induced impacts** reflect the broader economic effects when employees of the target sector spend their income in the economy. Together, these components show the ripple effect of the sector's activities on Canada's economic output.

The R&D pharmaceutical sector contributed $18.1 billion to the Canadian economy

The pharmaceutical R&D sector contributed a total gross value added (GVA) of $18.1 billion in 2023, a 1.7% decrease from the $18.4 billion recorded in 2022. This marks the first observed decrease since the studies started with the 2018 reference year, although it comes after a significant increase in the previous year.

All three impact types contributed to the decline in GVA in 2023. Direct impacts, which represented just over half of total GVA (52.0%), fell by 1.6%, dropping from $9.6 billion in 2022 to $9.4 billion. Indirect impacts, accounting for 27.4% of GVA, decreased by 0.8% to approximately $5.0 billion. Meanwhile, induced impacts – making up 20.6% of GVA, contracted 3.0% to $3.7 billion.

Overall, the R&D pharmaceutical sector accounted for 0.7% of Canada's GDP at basic prices in 2023, remaining unchanged from the previous year.[4]

Ontario and Quebec remain key centres for the R&D pharmaceutical sector

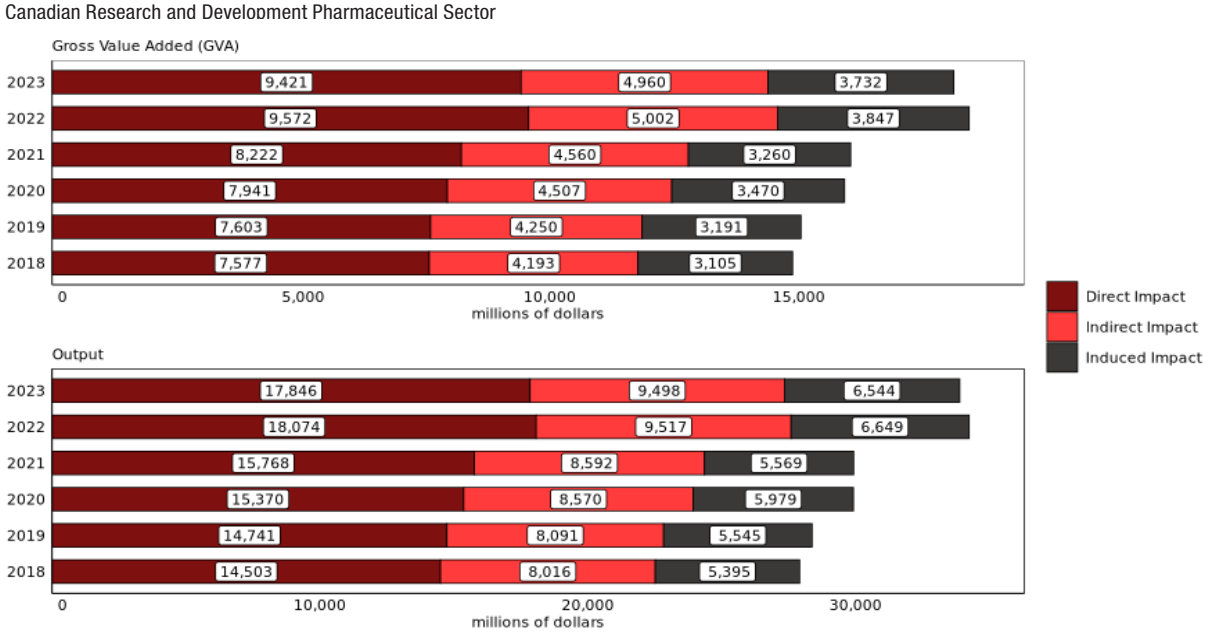
Ontario and Quebec represent the largest proportion of gross value added (GVA) in Canada for the sector, reflecting their larger economies and broad range of economic activities.

In 2023, these provinces collectively contributed $15.6 billion (85.9%) to the sector's total GVA, with Ontario representing $9.4 billion and Quebec accounting for $6.2 billion, respectively.

The labour component of Gross Value Added (GVA), representing employee compensation, amounted to $9.9 billion. Of this total, Ontario contributed $5.1 billion, while Quebec accounted for $3.5 billion.

4. Statistics Canada, table 36-10-0221-01. Preliminary estimates. Gross value added (GDP at basic prices) can be calculated from the table as gross domestic product at market prices minus taxes less subsidies on products and imports.

Figure 1
Gross value added (GDP at basic prices) and output (value of goods and services), 2018-2023 (millions of dollars)



Notes: The R&D pharmaceutical sector's total GVA was $14,875 million in 2018, $15,044 million in 2019, $15,918 million in 2020, $16,042 million in 2021, $18,421 million in 2022 and $18,114 million in 2023. The R&D pharmaceutical sector's total output was $27,915 million in 2018, $28,377 million in 2019, $29,919 million in 2020, $29,929 million in 2021, $34,240 million in 2022, and $33,888 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

2.1.2 Output

The R&D pharmaceutical sector produced $33.9 billion in output

In contrast to GVA, output measures the total value of all goods and services produced by a sector, including intermediate consumption. This broader metric offers insight into the scope and complexity of economic activity, highlighting the sector's role within supply chains and its contribution to the market.

In 2023, Canada's R&D pharmaceutical industry produced $33.9 billion in output, representing a 1.0% decrease from the $34.2 billion recorded in 2022. This marks the first negative growth since 2018 and mirrors similar trends in value added. All categories experienced declines: direct impacts, which make up 52.7% of total output, fell by $228 million to $17.8 billion; indirect impacts decreased by 0.2% to $9.5 billion; and induced impacts dropped by 1.6% to $6.5 billion.

The sector reported $40.1 billion in operating revenue

In 2023, R&D pharmaceutical businesses in Canada generated $40.1 billion in operating revenues, an increase of 6.1% ($2.3 billion) compared with the previous year.

Operating expenses grew by 6.3% to $39.9 billion in 2023, mainly due to a rise in purchased goods, materials, and services (up 8.2% to $32.5 billion).

With operating revenues exceeding operating expenses, the sector achieved an operating profit of $230 million. This represents a decline from the previous year's operating profit of $302 million, but remains a reverse from the loss of $2.2 billion in 2021.

2.1.3 Employment

The number of full-time equivalent jobs (FTEs) declined in 2023

The Canadian R&D pharmaceutical sector employed 103,964 FTEs in 2023. This marked a 6.2% decrease from the 110,817 FTEs noted in 2022. Ontario and Quebec accounted for 86.4% of these jobs, with 51,074 FTEs in Ontario and 38,760 FTEs in Quebec.

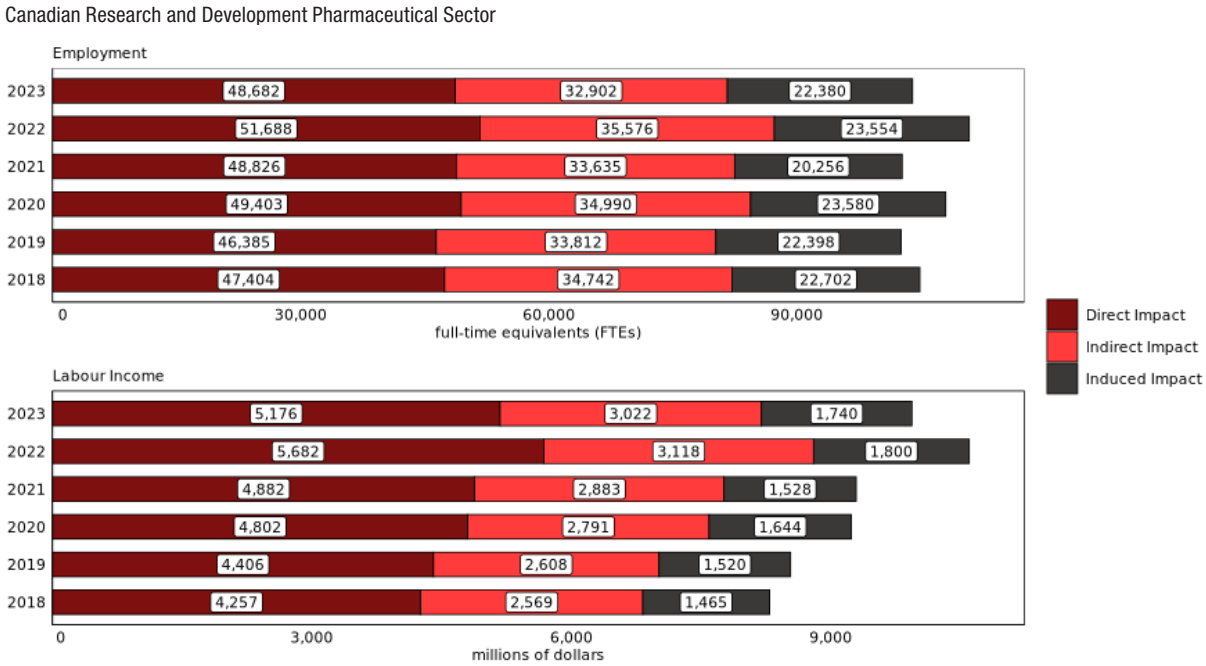
In terms of impacts, induced impacts experienced the smallest reduction, declining from 23,554 FTEs to 22,380 FTEs. Direct impacts decreased from 51,688 FTEs to 48,682 FTEs, while indirect impacts saw the most substantial decrease, falling from 35,576 FTEs to 32,902 FTEs.

Labour income declined in 2023

In 2023, labour income fell by 6.2% to $9.9 billion, mirroring a decline in overall employment.

Among the impact categories, the direct impact, which constitutes the largest proportion at 52.1%, experienced the most significant reduction, declining by 8.9% to $5.2 billion. The indirect impact, making up 30.4% of the total, decreased by 3.1% to $3.0 billion, while the induced impact, comprising the remainder, dropped 3.3% to $1.7 billion.

Figure 2
Employment (FTEs) and labour income (millions of dollars), 2018-2023



Notes: The R&D pharmaceutical sector's total jobs were 104,848 FTEs in 2018, 102,595 FTEs in 2019, 107,973 FTEs in 2020, 102,717 FTEs in 2021, 110,817 FTEs in 2022, and 103,964 FTEs in 2023. The R&D pharmaceutical sector's total labor income was $8,291 million in 2018, $8,534 million in 2019, $9,236 million in 2020, $9,293 million in 2021, $10,600 million in 2022, and $9,938 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

2.1.4 Trade

The Canadian research and development pharmaceutical sector is firmly integrated into the global trading system, engaging with 101 import and 108 export markets.

Sector imports declined in 2023

Goods imports fell by 1.3% in 2023 to $25.9 billion, marking the first decline since 2018. However, the number of partner countries increased from 96 to 101.

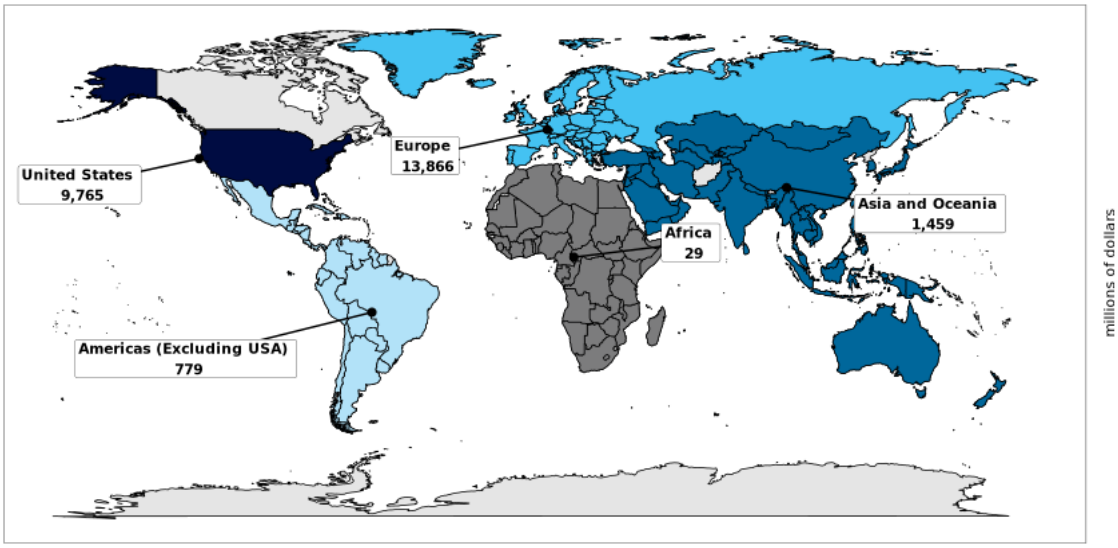
More than half of imports originated from Europe

Europe contributed over half (53.5%) of total imports, reaching $13.9 billion, while the United States[5] accounted for 37.7%, valued at $9.8 billion. Combined, these two regions accounted for 91.2% of all imported goods. While Europe saw a year over year growth of 1.4%, the United States saw a decline of 0.7%.

Asia and Oceania accounted for 5.6% of imports in 2023 and experienced the most significant decline, as imports decreased by 27.9% to $1.5 billion.

Figure 3
Total value (in dollars) of goods imports by region, 2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector



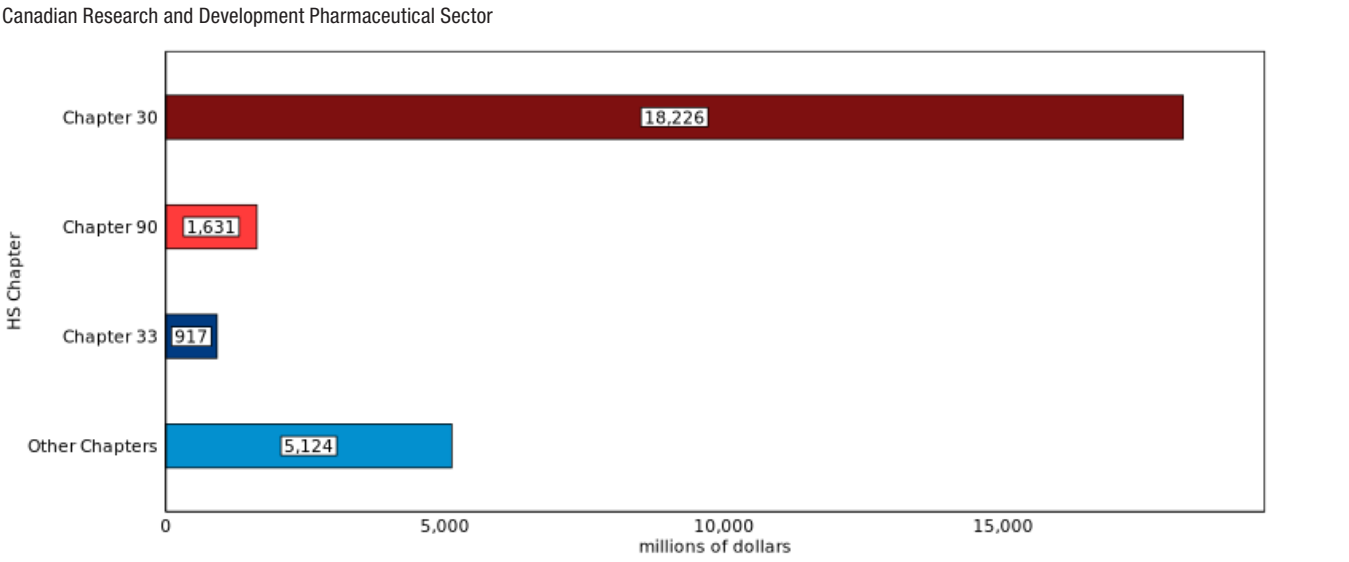
Notes: The value of the R&D pharmaceutical sector's total goods imports in 2023 was $25.9 billion. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Pharmaceutical products, classified under Chapter 30 of the Harmonized System (HS), represented the largest proportion of sector imports in 2023, comprising 70.4% ($18.2 billion) of the total value of all imported goods. Compared to the previous year, the value of these products declined by 4.5%. The second-largest import category was optical, photographic, cinematographic, measuring, checking, medical, or surgical instruments and apparatus (HS 90), which increased by 11.6% to $1.6 billion. Imports of essential oils and resinoids; perfumery, cosmetic, or toilet preparations (HS 33) also increased in 2023, rising by 18.3% to $917 million.

The above three HS categories have consistently been the largest identifiable imports since 2018.

5. In trade statistics, the United States is sometimes shown as a separate region because it represents the vast majority of Canada's trade within the Americas. This approach allows meaningful comparison with other major regions (e.g., Europe, Asia) and prevents U.S. trade flows from overshadowing smaller partners in the Americas total.

Figure 4
Total value (in dollars) of goods imports by Harmonized System Chapters, 2023 (millions of dollars)



Note: The Harmonized System (HS) Chapter 30 refers to pharmaceutical products, Chapter 90 refers to optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and apparatus; parts and accessories and, Chapter 33 includes the essential oils and resinoids; perfumery, cosmetic or toilet preparations. The value of the R&D pharmaceutical sector's total goods imports was $25,898 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Sector exports fell in 2023

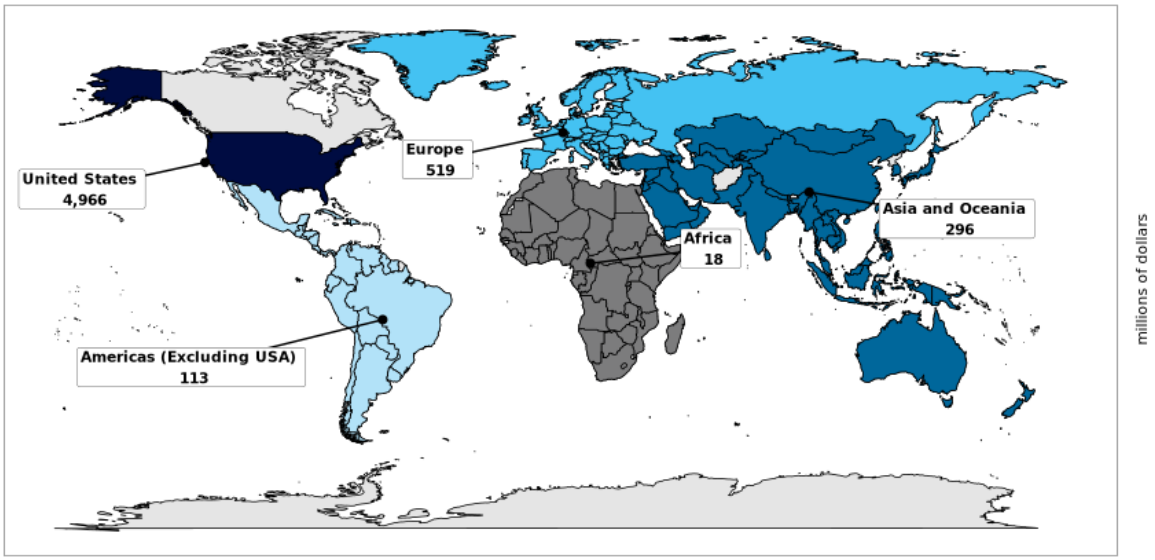
Exports tied to the Canadian R&D pharmaceutical sector declined 1.0% in 2023 to $5.9 billion. The number of export partners increased from 101 in the previous year to 108, mirroring the upward trend observed among import partners.

Decrease in exports balanced by US growth

Goods exports declined across all regions except the United States, which rose 0.9% to $5.0 billion. The Americas (excluding the U.S.) recorded the steepest drop, falling 30.2% to $113 million. Europe also contracted, down 0.2% to $519 million, while Asia and Oceania decreased 14.0% to $296 million and Africa declined 21.7% to $18 million.

Figure 5
Total value (in dollars) of goods exports by region, 2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector

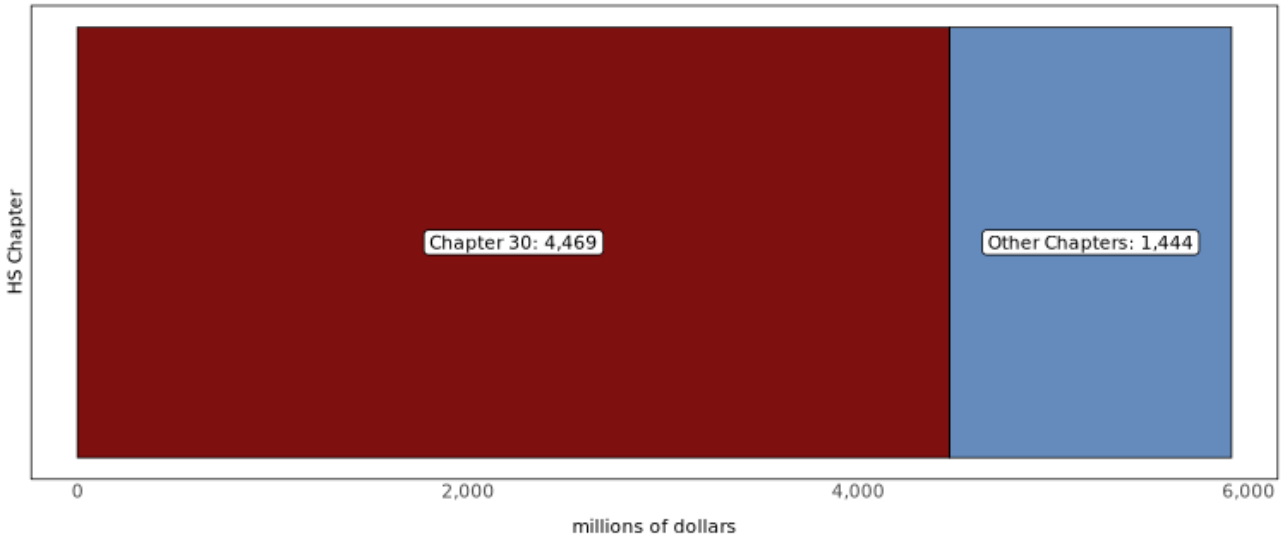


Notes: The value of the R&D pharmaceutical sector's total goods exports was $5.9 billion in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Pharmaceutical products (HS 30) continued to be the main exports for the sector, accounting for 75.6% of all goods, despite their export value dropping by 4.3% to $4.5 billion. Items classified under HS Chapter 30 include medicaments, vaccines, blood fractions, diagnostic reagents, and medical supplies like sterile sutures and first-aid kits. These products are largely used for therapeutic and preventive purposes.

Figure 6
Total value (in dollars) of goods exports by Harmonized System Chapters, 2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector



Note: The Harmonized System (HS) Chapter 30 refers to pharmaceutical products. The value of the R&D pharmaceutical sector's total goods exports was $5.9 billion in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Trade imbalance continued in 2023

The Canadian R&D pharmaceutical industry experienced a trade deficit of $20.0 billion, as the value of imported goods was higher than exports. This represents a slight improvement over 2022, when the deficit was $20.3 billion. Europe continued to be the region with the highest deficit at $13.3 billion, consistent with trends from previous years. The United States recorded the second largest deficit at $4.8 billion, representing a modest improvement compared to the previous year's $4.9 billion deficit.

2.2 Research and development (R&D)

2.2.1 Total research and development expenditures

Research and development (R&D) expenditures for the Canadian research and development pharmaceutical sector were collected through Statistics Canada's Annual Survey of Research and Development in Canadian Industry (RDCI). The RDCI is the primary source of information on R&D activities among Canadian enterprises and industrial non-profit organizations, as it provides detailed data on expenditures, personnel, and funding sources across all industries.[6]

The assessment of research and development activities is guided by the Frascati Manual, developed by the Organisation for Economic Co-operation and Development (OECD). This framework comprehensively encompasses basic research, applied research, and experimental development across all industry sectors, accounting for both current and capital expenditures.[7]

The RDCI survey separates R&D spending into in-house and outsourced activities. In-house R&D covers research performed by the organisation itself, including expenses like salaries, materials, and equipment, which showcase internal innovation strengths. Outsourced R&D involves funding third parties—such as universities and business partners—to carry out research for the organisation. By combining these two approaches, companies can take advantage of their own expertise as well as external collaborations to foster innovation.

The sector saw an increase in the overall range of total R&D expenditures in 2023

To reduce the risk of double counting resulting from domestic outsourcing, Statistics Canada presents total R&D expenditures as a range, specifying both lower and upper limits. This methodology addresses scenarios in which one organisation finances R&D while another executes it, thereby raising the possibility of both entities reporting the same activity.

To further resolve this reporting challenge, the lower bound includes both internal R&D efforts and outsourcing to foreign partners, whereas the upper bound captures all outsourced expenditures, whether incurred domestically or internationally.

For 2023, total R&D expenditures by the sector are estimated to range between $2.7 billion to $3.5 billion, which is up from the $2.5 billion to $3.2 billion range in the previous year.

2.2.2 In-house research and development expenditures

The Canadian R&D pharmaceutical sector saw its in-house expenditures rise by 9.0% to reach $2.0 billion in 2023.[8] This figure marks the sector's highest internal spending since this study series began in 2018.

Amongst all industries, the Canadian R&D pharmaceutical industry accounted for 5.7% of all business expenditures on research and development (BERD), which remained unchanged from the previous year.[9]

6. The survey incorporates a sample comprising several thousand enterprises engaged in R&D with modelled data for smaller performers. Its methodology is designed to ensure detailed estimates of R&D activities across the entire business sector in Canada.
7. By comparison, the Canada Revenue Agency (CRA) defines R&D for tax purposes under the Scientific Research & Experimental Research program, focusing on systematic efforts to achieve technological advancement and considering primarily eligible costs as wages and materials.
8. Total in-house R&D expenditures are made up of current in-house R&D expenditures (including wages and salary, services to support R&D and R&D materials) and capital in-house R&D expenditures (including land, building, software and equipment and machinery).
9. This comparison is for illustrative purposes only as the Canadian R&D pharmaceutical sector is a generic name created for the purposes of this study series.

Table 1
In-house R&D expenditures, 2018-2023 (x1,000,000)

	2018	2019	2020	2021	2022	2023
	millions of dollars					
Total industrial R&D (all industries)[1, 2]	20,855	21,920	23,679	27,783	31,918	34,968
Canadian R&D pharmaceutical sector	1,032	1,107	1,274	1,592	1,831	1,995
IMC members	623	723	797	911	1,042	1,160

1. Figures from Business enterprise in-house research and development expenditures by industry groups, country of control and expenditure types can be found in Statistics Canada, table 27-10-0333-01.
2. The value for 'Total industrial R&D (all industries)' goes through a preliminary and revision cycle. All values from 2022 and earlier are now considered final and may differ from previous publications. The value for 2023 is still preliminary.
Source: Statistics Canada, custom tabulation, reference year 2018-2023.

R&D investment driven by current in-house spending

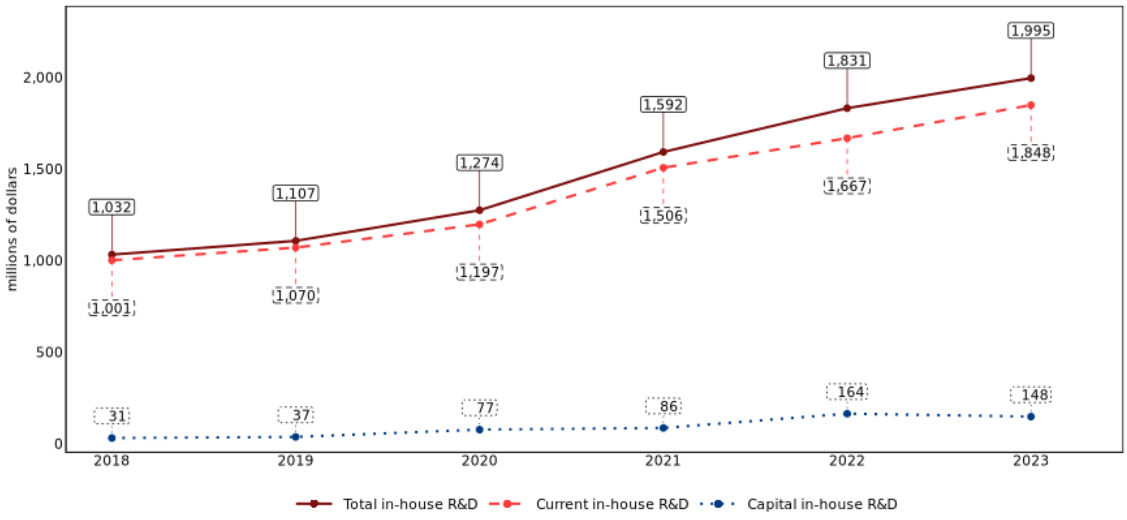
The primary factor contributing to the increase in in-house research and development (R&D) activities was a rise in current in-house R&D expenditures, which rose by 10.9% over the previous year to $1.8 billion in 2023.[10] These expenditures, which comprise 92.6% of total in-house R&D spending, represent all costs incurred by businesses to conduct R&D within their own facilities, including labor, materials, and overhead.

Wages and salaries made up the largest share of current in-house expenses for businesses, accounting for 56.6% and rising to $1.0 billion. These costs have been increasing consistently since 2018. Other current costs, which include services supporting R&D, R&D materials, and miscellaneous ongoing expenses, comprised the remainder of in-house costs and increased to $801 million.

In contrast, capital in-house expenditures, the second major component of in-house spending at 7.4%, declined by 9.8% to $148 million in 2023. Capital expenditures encompass long-lasting assets comprising R&D-related software, land, buildings, and equipment.

Figure 7
In-house R&D expenditures, 2018-2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector



Note: Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

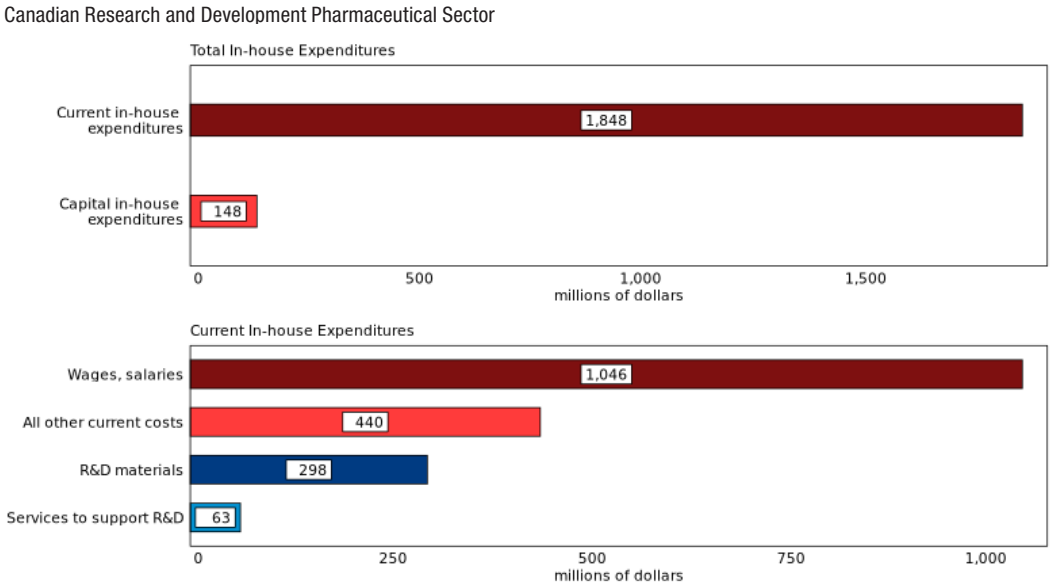
10. An increase in the number of SR&ED claims or approved companies does not necessarily indicate higher overall R&D spending—it may simply reflect more participation in the program.

R&D workforce expanded in 2023

In 2023, the sector experienced a 5.1% increase in its total R&D workforce, reaching 9,267 full-time equivalents (FTEs). This expansion was primarily attributed to a rise in the number of researchers and research managers, which grew by 19.8% to 5,042 FTEs. Within this group, positions related to scientists, social scientists, engineers and researchers increased from 3,472 FTEs to 4,130 FTEs, while senior research manager roles rose from 738 FTEs to 912 FTEs. Notably, the number of scientists, social scientists, engineers and researchers has shown consistent growth since 2018 when the number of FTEs were 2,300.

The overall growth in FTEs was linked to the province of Ontario, where R&D employment grew by 9.0% to 3,059 FTEs, as well as to the Rest of Canada,[11] which experienced a larger percentage gain - up 14.2% to 1,886 FTEs. In contrast, Quebec saw a small decline of 0.9%, bringing its total to 4,322 FTEs. This decrease was much smaller than in 2022, when the province lost 9.7% of its FTEs, dropping to 4,361.

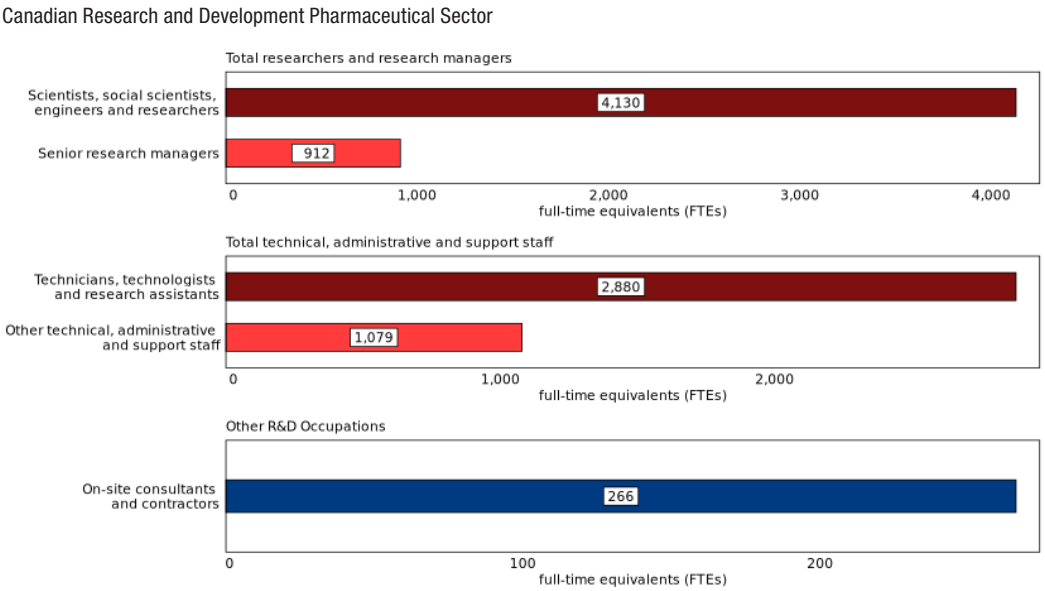
Figure 8
In-house R&D expenditures by type of expenditure, 2023 (millions of dollars)



Notes: The R&D pharmaceutical sector's total in-house R&D expenditures were $1,995 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

11. The Rest of Canada is defined as all provinces and territories, excluding Ontario and Quebec.

Figure 9
Full-time equivalent jobs (FTEs) in R&D personnel by occupation, 2023



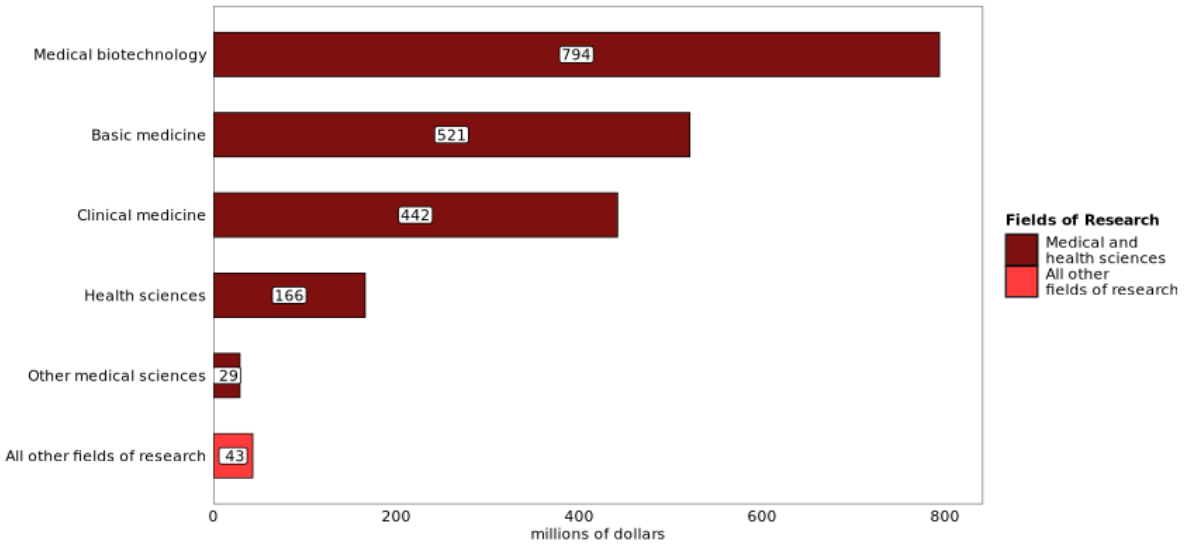
Notes: The R&D pharmaceutical sector's total jobs in R&D personnel were 9,267 FTEs in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Sector concentrated in the medical and health sciences field of R&D

According to the Frascati Manual, research and development (R&D) activities are classified into various fields of research: natural sciences, engineering and technology, medical and health sciences, agricultural sciences, social sciences, and humanities. As its name suggests, the Canadian R&D pharmaceutical sector is largely focused on medical and health sciences, making up 97.9% of its activity. In 2023, in-house spending in this major field reached $2.0 billion, marking a 14.1% increase from the previous year. Most of the funds went to three main sub fields: medical biotechnology accounted for 40.7% ($794 million), basic medicine represented 26.7% ($521 million), and clinical medicine accounted for 22.6% ($442 million).

Figure 10
In-house R&D expenditures by field of research, 2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector



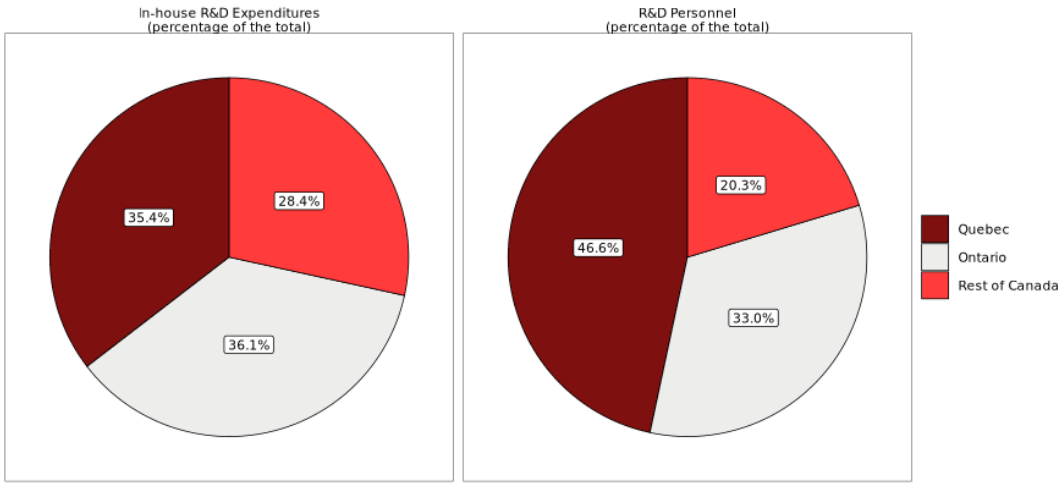
Notes: The R&D pharmaceutical sector's total in-house R&D expenditures were $1,995 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Most in-house R&D spending took place in Ontario and Quebec

Within Canada, Ontario and Quebec represented 71.6% of the sector's total in-house expenditures in 2023. The proportions were comparable, with Ontario comprising 36.1% ($721 million) of spending and Quebec accounting for 35.4% ($707 million). Despite similar expenditure levels, Ontario experienced nearly double the growth rate (22.6%) compared to Quebec (13.1%). The remaining in-house expenditures ($567 million) were attributed to the Rest of Canada, which saw a decline of 8.3% from 2022.

Figure 11
Share of in-house R&D expenditures and full-time equivalent jobs (FTEs) in R&D personnel by region, 2023

Canadian Research and Development Pharmaceutical Sector



Note: The R&D pharmaceutical sector's total in-house R&D expenditures were $1,995 million and total jobs in R&D personnel were 9,267 FTEs in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Foreign funding for in-house R&D exceeded domestic contributions

In 2023, foreign funding tied to in-house R&D experienced an increase of 17.6%, rising from $940 million to $1.1 billion. Consequently, the proportion of this funding allocated to in-house research also expanded, increasing from 51.3% in 2022 to 55.4% in 2023. Despite these gains, the current share remains below the peak level of 58.4% recorded in 2020 - a year distinguished by a shift when domestic sources previously constituted a greater proportion of R&D investment.

Domestic funding, which includes funds from businesses themselves, from other related businesses and from business contracts, remained at about the same amount as the previous year (down a marginal 0.1% to $890 million). This source of funds accounted for 44.6% of total funds.

The nature of the R&D

How businesses use R&D depends on the nature of their work. Research and development are distinct activities that can be independently measured as basic research, applied research, or experimental development. Basic research aims to expand general knowledge without immediate practical goals, while applied research uses current knowledge to solve specific problems. Experimental development focuses on designing, creating, or improving products, processes, or technologies.[12]

Within the sector, in-house R&D expenditures have been classified into two principal categories based on the nature of their activities: initiatives aimed at generating new knowledge (encompassing both basic and applied research), and experimental development efforts.[13] In 2023, over half (55.1%) of total expenditures were dedicated to new knowledge initiatives, while the balance supported experimental development. Overall, investment in new knowledge rose 10.2% to $1.1 billion. Concurrently, spending on experimental development grew by 7.4%, reaching $896 million.[14]

Across all remaining industries, firms collectively tend to allocate a larger share of their internal R&D budgets to experimental development. Accordingly, in 2023, organizations within this group directed 85.4% of total R&D expenditures ($28.2 billion) toward experimental development, while basic and applied research received $4.8 billion.[15]

Table 2
Nature of research and development, Canadian R&D pharmaceutical sector, 2023 (x 1,000,000)

	Canadian R&D Pharmaceutical Sector	Percentage of All Industries	All Other Industries[1]
	millions	percent	millions
Total in-house research and development expenditures in Canada	1,995	5.71	32,973
Total Research	1,099	18.59	4,814
Experimental development	896	3.08	28,159

1. The total expenditures for all industries in Canada, excluding expenditures by the Canadian R&D Pharmaceutical Sector.
Source: Statistics Canada. Business enterprise in-house research and development expenditures, by industry group, country of control and nature of research and development (x 1,000,000), Table 27-10-0344-01, reference year, 2023.

2.2.3 Outsourced research and development expenditures

R&D outsourcing increased in 2023

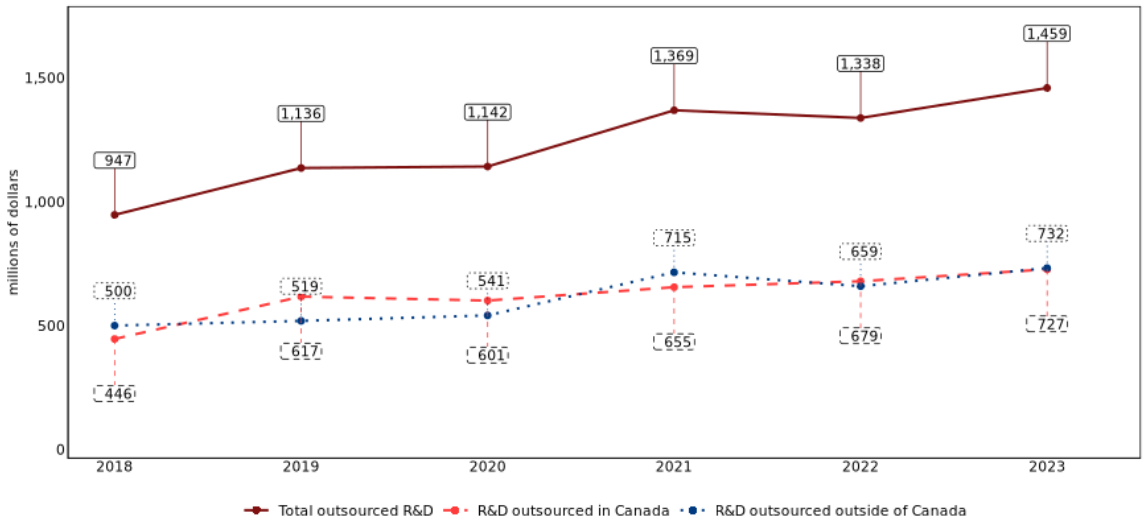
In 2023, the R&D pharmaceutical sector spent $1.5 billion on all outsourced R&D to meet business needs, a 9.0% increase from the previous year. Both foreign and domestic outsourcing grew. Specifically, foreign outsourcing rose 11.1% to $732 million, while domestic outsourcing went up 7.1% to $727 million - mainly due to greater collaboration with other businesses (up 7.0% to $504 million), and hospitals and universities (up 11.9% to $132 million).

12. OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris.
13. This publication groups information on both basic and applied research together to comply with confidentiality requirements.
14. Business enterprise in-house research and development expenditures by industry groups, country of control and nature of research and development can be found in Statistics Canada, table 27-10-0344-01.
15. Business enterprise in-house research and development expenditures by industry groups, country of control and nature of research and development can be found in Statistics Canada, table 27-10-0344-01.

Although the sector's outsourced R&D reached $1.5 billion in 2023, it remained below its in-house spending of $2.0 billion. In comparison, all other industries in Canada spent $33.0 billion on in-house R&D, which was over six times greater than the $5.1 billion it allocated to outsourced R&D. The fact that firms allocated greater resources to internal R&D compared to outsourced R&D highlights the significance of maintaining robust internal research and development efforts.

Figure 12
Outsourced R&D expenditures by recipient, 2018-2023 (millions of dollars)

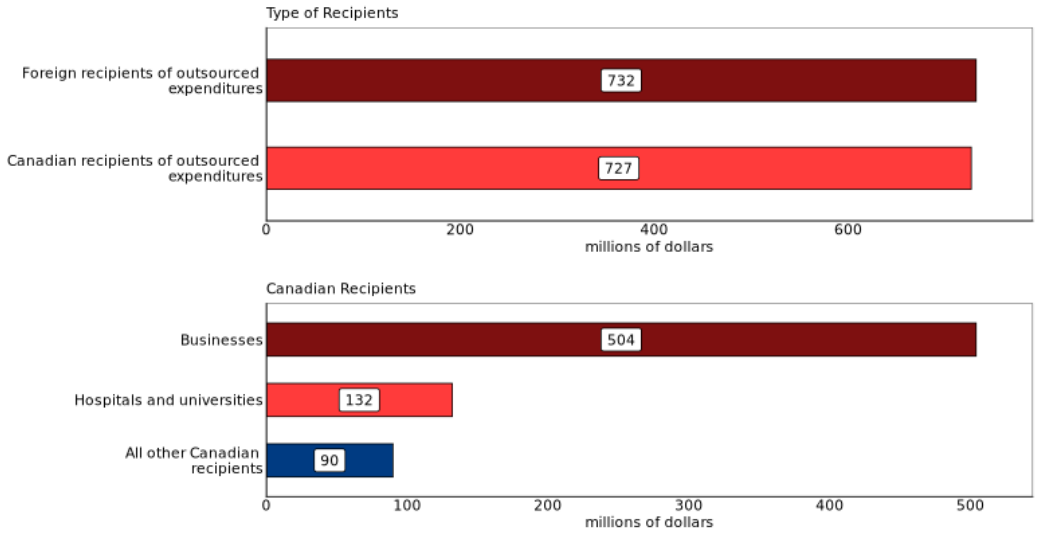
Canadian Research and Development Pharmaceutical Sector



Note: Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

Figure 13
Outsourced R&D expenditures by sector, 2023 (millions of dollars)

Canadian Research and Development Pharmaceutical Sector



Note: The R&D pharmaceutical sector's total outsourced R&D expenditures were $1,459 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

2.2.4 Tax credits available to businesses engaged in R&D

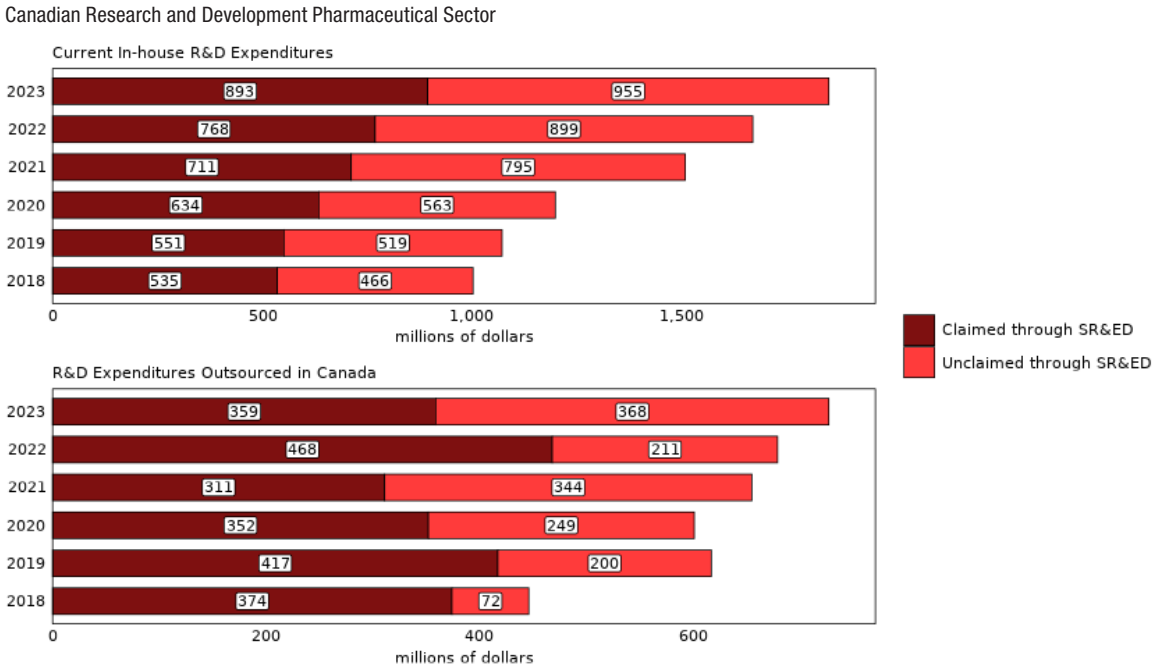
The Canada Revenue Agency administers the Scientific Research and Experimental Development (SR&ED) Program, which enables eligible organizations to obtain either a tax deduction or an investment tax credit at rates ranging from 15% to 35%, depending on their size and classification, for specified R&D expenditures. Although certain costs—such as capital expenditures and overseas research and development—are not eligible, the SR&ED program remains one of Canada's principal mechanisms for promoting technological progress and reinforcing the national innovation ecosystem. The program applies to businesses across all sizes and sectors, offering incentives specifically designed to stimulate innovation.[16]

Sector claimed $1.3 billion in SR&ED tax credits

In 2023, businesses in the sector obtained $1.3 billion in tax credits from the Canada Revenue Agency's SR&ED program, marking a 1.4% increase from the previous year.[17] Most of these claims (71.3%) related to in-house R&D spending, which grew by 16.3% to $893 million. The rest of the credits went to R&D activities that were outsourced within Canada, which fell by 23.3% to $359 million.

Since 2020, more than 60% of SR&ED claims in Canada have centered on in house expenditures rather than domestically outsourced work. This pattern underscores the strategic importance of in house R&D.

Figure 14
R&D expenditures claimed through SR&ED, 2018-2023 (millions of dollars)



Notes: The R&D pharmaceutical sector's total current in-house R&D expenditures were $1,001 million in 2018, $1,070 million in 2019, $1,197 million in 2020, $1,506 million in 2021, $1,667 million in 2022, and $1,848 million in 2023. The sector's total outsourced in Canada R&D expenditures was $446 million in 2018, $617 million in 2019, $601 million in 2020, $655 million in 2021, $679 million in 2022, and $727 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

16. Canada Revenue Agency (2023, December 1). What are SR&ED tax incentives: Scientific Research and Experimental Development (SR&ED) tax incentives.
17. An increase in tax credits can result from several factors and does not necessarily reflect a discretionary change by the Canada Revenue Agency from one year to the next. Variables such as a higher number of applicants and larger claim amounts are factors that can play a significant role.

Canadian businesses had over twice as many approved SR&ED claims as foreign firms

In 2023, the number of SR&ED claims approved for Canadian-controlled businesses exceeded those for foreign-controlled companies operating in Canada by more than twofold. Of the total 87 approved claims, a figure that represents an 8.4% drop from the previous year, 60 were made by Canadian entities, while the rest came from foreign-controlled firms.

Despite having more approved claims, Canadian-controlled businesses received a smaller share of total in-house SR&ED tax credits. For the year, Canadian-controlled businesses received $278 million in in-house SR&ED tax credits (up 31.8% from 2022), while foreign-controlled businesses received $615 million (up 10.4%).

Credits for outsourced R&D within Canada declined for both groups in 2023. Canadian-controlled firms claimed $90 million, down 15.9% from the prior year, while foreign-controlled firms claimed $269 million, representing a drop of 25.5%. Among foreign-controlled firms, those based in the United States comprised 46.1% of claims, increasing 29.2% to $124 million, while non-U.S. foreign firms accounted for the remainder—decreasing 45.3% to $145 million.

3 Innovative medicines Canada (IMC) members

3.1 Economic footprint

Alongside the sectoral overview included in this study, the subsequent sections will provide a comprehensive analysis distinguishing the economic impact of IMC members, comprising 53 pharmaceutical companies in Canada engaged in R&D, from that of non-members who represent the majority of the industry. The analysis will primarily centre on IMC members, with direct comparisons to non-members to offer greater context and understanding.

3.1.1 Value added

IMC members contributed $9.8 billion to the Canadian economy

In 2023, IMC members contributed $9.8 billion in gross value added (GVA) to the national economy, representing an 8.7% increase over the prior year and comprising 54.0% of the sector's total GVA. Conversely, non-members saw an 11.6% decrease, resulting in their GVA declining to $8.3 billion.

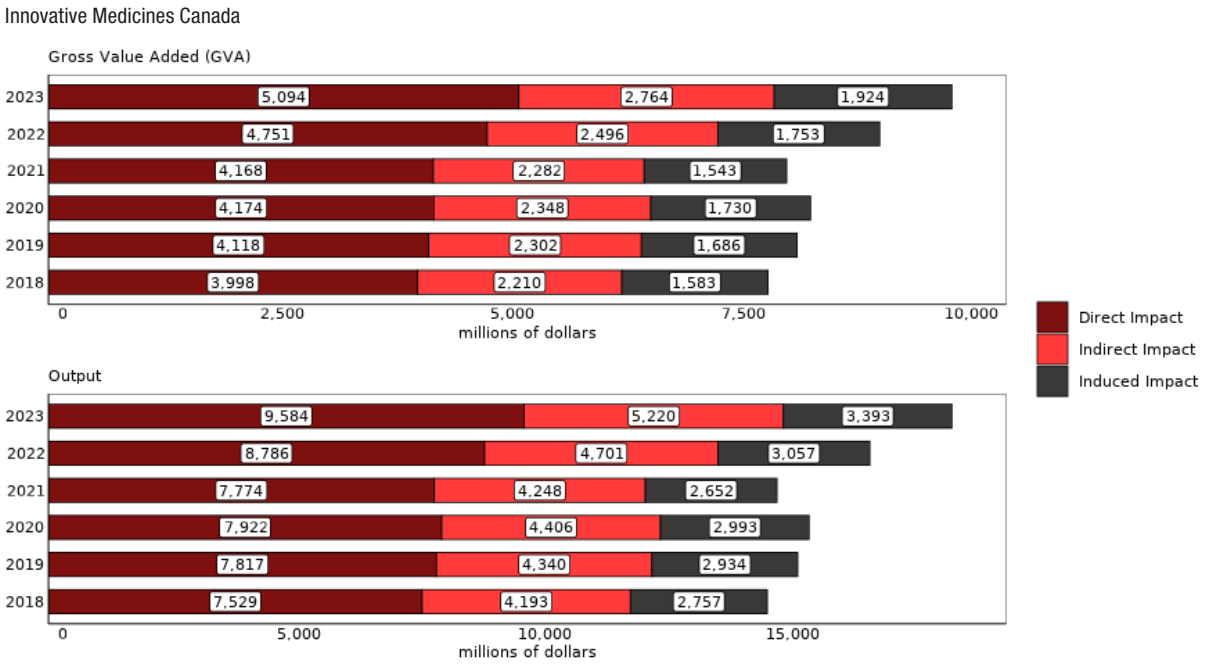
Comparable trends were identified across each GVA component—direct, indirect, and induced impacts—for both groups. For IMC members, direct impacts increased by 7.2% to $5.1 billion, indirect impacts grew by 10.7% to $2.8 billion, and induced impacts advanced by 9.8% to $1.9 billion. Conversely, non-members experienced decreases in all categories: direct impacts fell by 10.2% to $4.3 billion, indirect impacts declined by 12.4% to $2.2 billion, and induced impacts decreased by 13.7% to $1.8 billion.

Of the various impact types, indirect impacts demonstrated the greatest differential (25.9%) between IMC members and non-members, followed by direct impacts (17.7%) and induced impacts (6.4%).

Connecting these findings to Canada’s gross domestic product, IMC members represented 0.35% of Canada’s GDP at basic prices, which is an increase of 0.01% from 2022. In comparison, non-members accounted for 0.30%.[18]

18. Statistics Canada, table 36-10-0221-01. Preliminary estimates. Gross value added (GDP at basic prices) can be calculated from the table as (gross domestic product at market prices) minus (taxes less subsidies on products and imports).

Figure 15
Gross value added (GDP at basic prices) and output (value of goods and services), 2018-2023 (millions of dollars)



Notes: IMC members' total GVA was $7,791 million in 2018, $8,106 million in 2019, $8,252 million in 2020, $7,993 million in 2021, $9,000 million in 2022, and $9,783 million. IMC members' total output was $14,479 million in 2018, $15,091 million in 2019, $15,321 million in 2020, $14,674 million in 2021, $16,544 million in 2022, and $18,197 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

Ontario and Quebec continue to be central areas for both members and non-members

Ontario and Quebec, Canada's two most populous provinces, accounted for the highest GVA contributions from both IMC members and non-members. Among IMC members, these two provinces represented 90.7% of total GVA, which together increased by 7.0% to reach $8.9 billion. Provincial growth patterns differed between the two, with Ontario experiencing a significant rise (up 15.2% to $5.0 billion), while Quebec saw a small decline (down 2.0% to $3.9 billion). For non-members, these provinces made up 80.3% of overall GVA, but their combined total dropped by 6.4% to $6.7 billion.

Both provinces played major roles in generating labour income, which is an important component of GVA. Among IMC members, Ontario and Quebec together made up 92.3% ($4.8 billion) of total labour income, with Ontario driving most of the growth—a 10.3% rise to $2.6 billion. For non-members, the largest shares of labour income came from Ontario, Quebec, and British Columbia; however, combined income from these three provinces dropped by 15.9% to $4.4 billion. The steepest decline was in British Columbia, where labour income decreased 43.1% to $600 million.

3.1.2 Output

Output rose for IMC members but fell for non-members

Although the pharmaceutical sector itself experienced a reduction in output in 2023, IMC members saw their output increase 10.0% to $18.2 billion. This uptick helped counterbalance the decline among non-members, whose output decreased by 11.3% to $15.7 billion.

For IMC members, the increase in output was attributable to growth across all impact categories. In particular, direct impacts increased from $8.8 billion to $9.6 billion, indirect impacts rose from $4.7 billion to $5.2 billion, and induced impacts grew by 11.0% to $3.4 billion. Conversely, non-members experienced declines in each impact category. Specifically, direct impacts decreased by 11.0% to $8.3 billion, indirect impacts fell to $4.3 billion, and induced impacts contracted by 12.3% to $3.2 billion.

Ontario and Quebec were key output regions for both groups

Canada's largest provinces remained key drivers of economic output for IMC members and non-members in 2023. Among members, Ontario and Quebec represented a combined 90.4% of total production, which increased 8.2% to $16.5 billion, primarily due to robust growth in Ontario (up 15.2% to $9.3 billion).

Ontario and Quebec contributed 81.8% of output for non-members but jointly fell 6.6% to $12.8 billion. British Columbia, the third largest contributor, declined 34.9%—a steeper drop than both Ontario and Quebec.

Operating profits rose in 2023 for IMC members

Both IMC members and non-members experienced increases in operating revenue and expenses during 2023, but only members reported an operating profit.

Operating revenue for members rose by 2.4% to $23.4 billion, whereas non-member revenue increased by 11.8% to $16.8 billion. In terms of expenses, both groups faced rises—members' expenses grew by 0.1% to $22.7 billion, while non-members' expenses rose 15.8% to $17.2 billion.

Given the spread in revenue and expenses between each group, IMC members were the only group to post an operating profit, which rose from $154 million to $670 million. In fact, their gain offset the non-members' negative operating profit of -$440 million and thus led to the sector's overall positive result.

3.1.3 Employment

Innovative Medicines Canada members were responsible for nearly half of the jobs supported by the sector

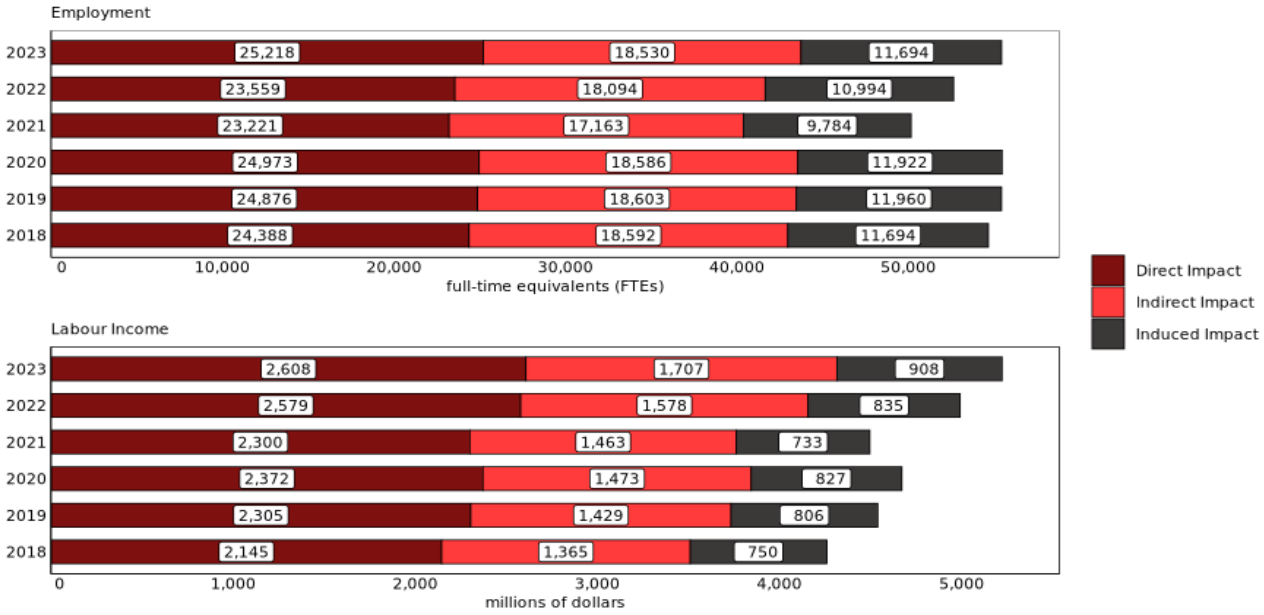
Between 2022 and 2023, IMC members saw an increase in their FTEs, which rose from 52,647 to 55,442. All three impact categories contributed to this growth: direct impacts increased by 7.0% to reach 25,218 FTEs, indirect impacts rose by 2.4% to 18,530 FTEs, and induced impacts grew by 6.4% to 11,694 FTEs. Non-members saw the opposite trend, with total FTEs decreasing from 58,170 to 48,522. Declines were seen across all impact types, which contributed to an overall reduction in FTEs within the pharmaceutical sector.

Labour income for IMC members reached $5.2 billion

Consistent with earlier patterns, IMC members saw their labour income rise in 2023 (up 4.6% to $5.2 billion), while non-members experienced a decline (down 15.9% to $4.7 billion). For members, each impact category experienced growth: direct impacts rose by 1.1% to $2.6 billion, indirect impacts increased by 8.2% to $1.7 billion, and induced impacts expanded by 8.7% to $908 million. In contrast, non-members observed declines across all impact categories.

Figure 16
Employment (FTEs) and labour income (millions of dollars), 2018-2023

Innovative Medicines Canada



Notes: IMC members' total jobs were 54,674 FTEs in 2018, 55,439 FTEs in 2019, 55,481 FTEs in 2020, 50,168 FTEs in 2021, 52,647 FTEs in 2022, and 55,442 FTEs in 2023. IMC members' total labour income was $4,260 million in 2018, $4,540 million in 2019, $4,672 million in 2020, $4,496 million in 2021, $4,992 million in 2022 and $5,223 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

3.1.4 Trade

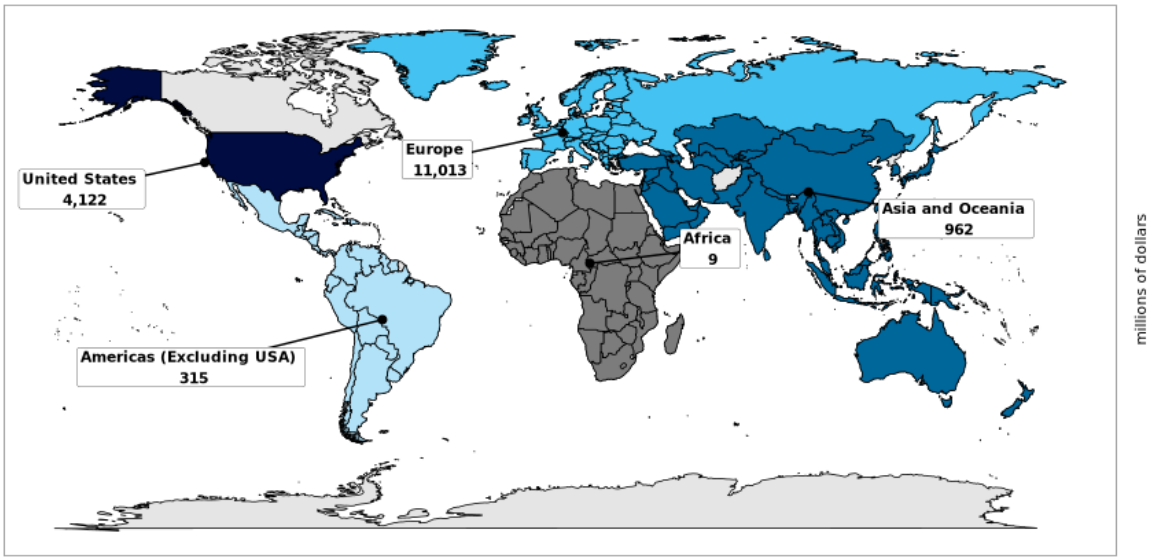
Imports declined for IMC members in 2023

In 2023, total imports in Canada's R&D pharmaceutical sector dropped mainly due to a 7.9% decrease by IMC member companies, whose imports fell to $16.4 billion. Partially counterbalancing the decrease in imports was an increase in imports from non-member companies, which rose by 12.6% to $9.5 billion.

Both groups differed in terms of key market access. For IMC members, the primary import region was Europe (67.1%), where imports declined to $11.0 billion (down 1.8%). For non-members, the United States served as the core market (59.5%) with imports reaching $5.6 billion (up 12.8%).

Figure 17
Total value (in dollars) of goods imports by region, 2023 (millions of dollars)

Innovative Medicines Canada



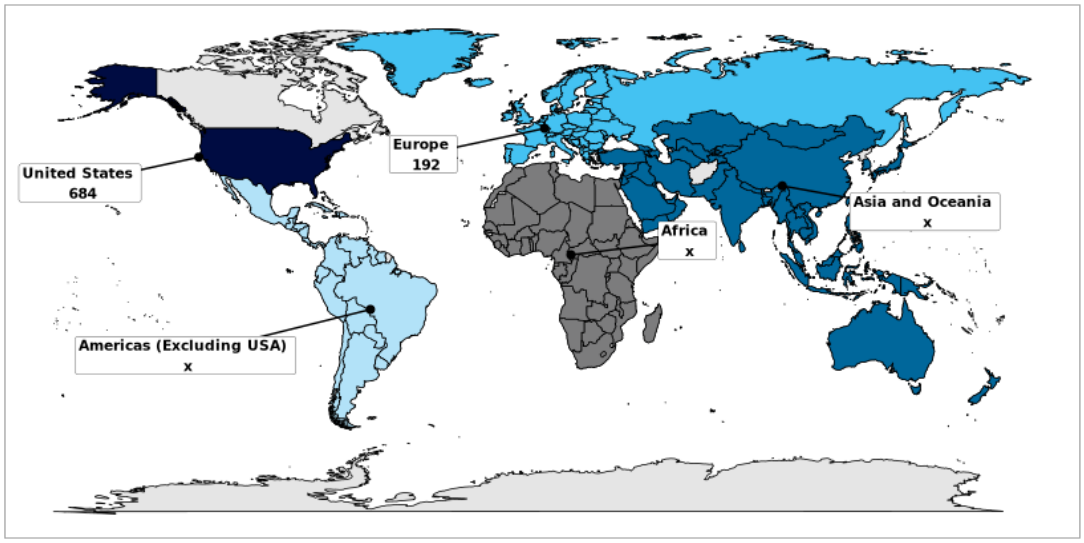
Notes: The value of IMC members' total goods imports was $16,420 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Exports in the R&D pharmaceutical sector are primarily driven by non-member companies, whose export volume surpassed that of member companies by a factor of more than four in 2023. Nevertheless, non-member companies experienced a 1.7% decline in exports to $4.8 billion. Conversely, member companies recorded a 1.9% increase to $1.1 billion.

Among non-members, the United States was the top export destination, making up 88.7% of the total market share. During the year, exports to the United States dropped by $189 million to $4.3 billion. For members, most goods were sent to the United States (up 51.0% to $684 million) and Europe (down 34.5% to $192 million).

Figure 18
Total value (in dollars) of goods exports by region, 2023 (millions of dollars)

Innovative Medicines Canada



Notes: The value of the IMC members' total goods exports was $1,087 in 2023. 'x' indicates datapoint suppressed to meet the confidentiality requirements of the *Statistics Act*. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

3.2 Research and development

3.2.1 Total research and development expenditures

To avoid double counting, and as noted earlier in this study, Statistics Canada presents total R&D expenditures as a range, specifying both lower and upper limits. Based on this approach, IMC members' total R&D expenditures in 2023 ranged from $1.3 billion to $1.8 billion, while non-members ranged between $1.4 billion and $1.6 billion.

3.2.2 In-house research and development expenditures

IMC members spent more on in-house R&D than non-members

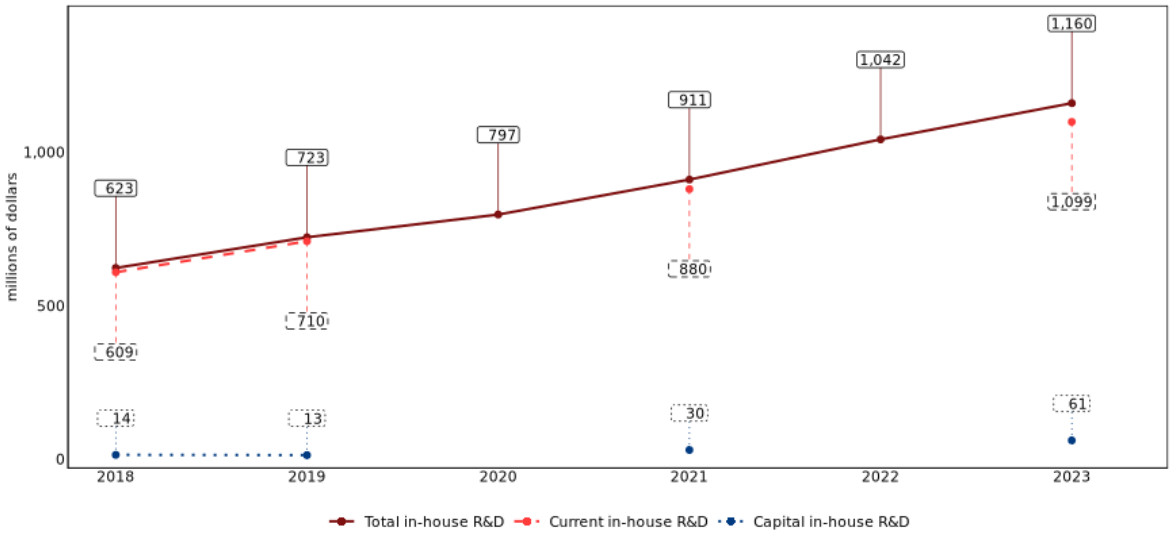
In 2023, both IMC members and non-members reported higher overall in-house R&D spending than in 2022, though IMC members spent more than non-members. Specifically, IMC members increased their in-house expenditures by 11.3%, reaching $1.2 billion. This resulted in a slight rise in their share of total spending, from 56.9% to 58.1%, while their share of BERD held steady at 3.3%, the same as the previous year.[19]

Non-members also experienced growth in in-house expenditures, which rose from $789 million to $835 million during the same period.

19. Business enterprise in-house research and development expenditures (BERD), by industry group based on the North American Industry Classification System (NAICS). Table: 27-10-0333-01 (formerly CANSIM 358-0510).

Figure 19
In-house R&D expenditures, 2018-2023 (millions of dollars)

Innovative Medicines Canada



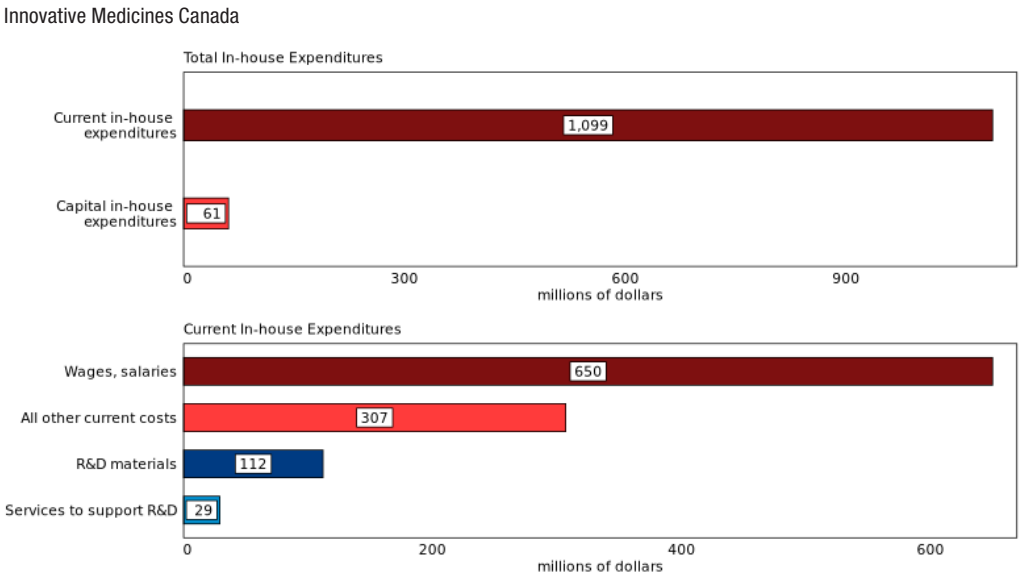
Notes: Missing data indicates that the data point was suppressed to meet the confidentiality requirements of the *Statistics Act*. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

Wages and salaries represent the largest part of in-house costs

Wages and salaries were the largest in-house cost in 2023 for both groups.[20] For members, they constituted 56.0% of total expenses and increased from $611 million to $650 million. For non-members, wages and salaries represented 47.4% of costs and rose from $370 million to $396 million.

20. Wages, salaries of permanent, temporary and casual R&D employees include benefits and fringe benefits of employees engaged in R&D activities. Benefits and fringe benefits include bonus payments, holiday or vacation pay, pension fund contributions, other social security payments, payroll taxes, etc.

Figure 20
In-house R&D expenditures by type of expenditure, 2023 (millions of dollars)



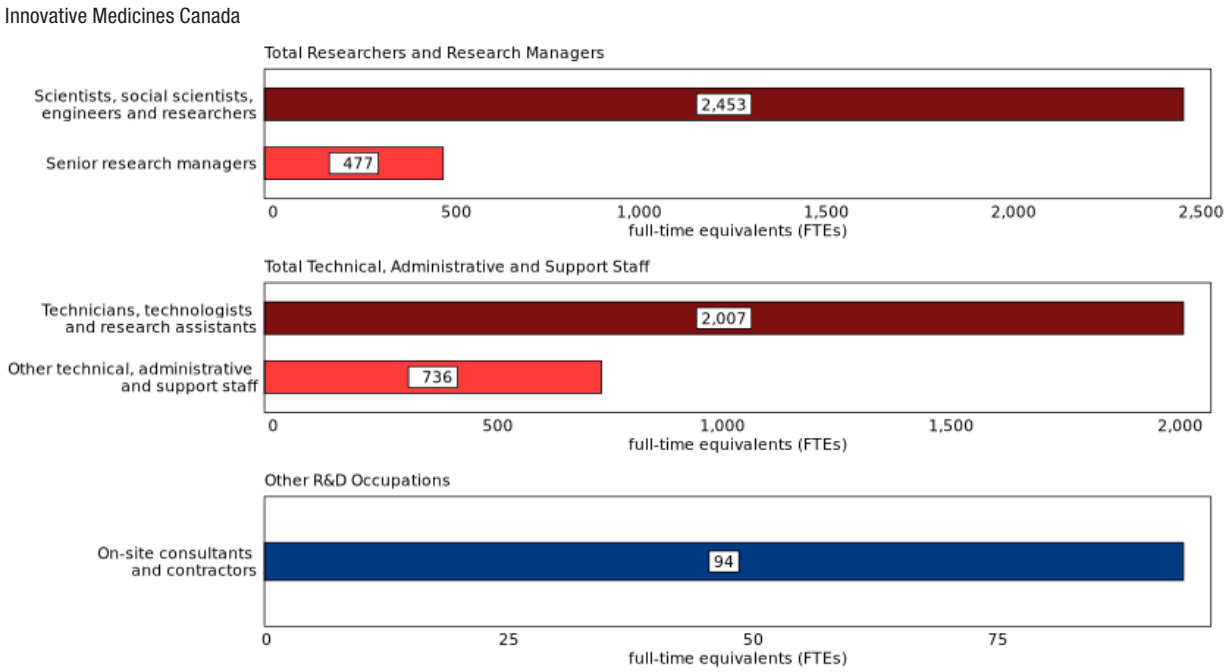
Notes: IMC members' total in-house R&D expenditure was $1,160 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023

Both IMC members and non-members contributed to the overall growth in R&D personnel that the sector saw in 2023, which reached 9,267 full-time equivalents (FTEs). Non-members accounted for a greater impact as FTE numbers rose from 3,116 to 3,500, while FTEs tied to IMC members increased from 5,701 to 5,767.

Notably, IMC members made up 62.2% of all R&D staff in the sector, with overall growth linked to an increase in the researchers and research managers category - rising from 2,511 to 2,930 full-time equivalents (FTEs). The growth was driven by occupations such as scientists, social scientists, engineers, and researchers, which saw a 17.5% jump from 2,088 to 2,453 FTEs. Meanwhile, numbers decreased for technical, administrative and support staff, as well as on-site consultants and contractors.

The growth in R&D personnel among non-members was primarily concentrated in occupations tied to scientists, social scientists, engineers and researchers, which rose from 1,384 FTEs in 2022 to 1,677 FTEs in 2023.

Figure 21
Full-time equivalent jobs (FTEs) in R&D personnel by occupation, 2023



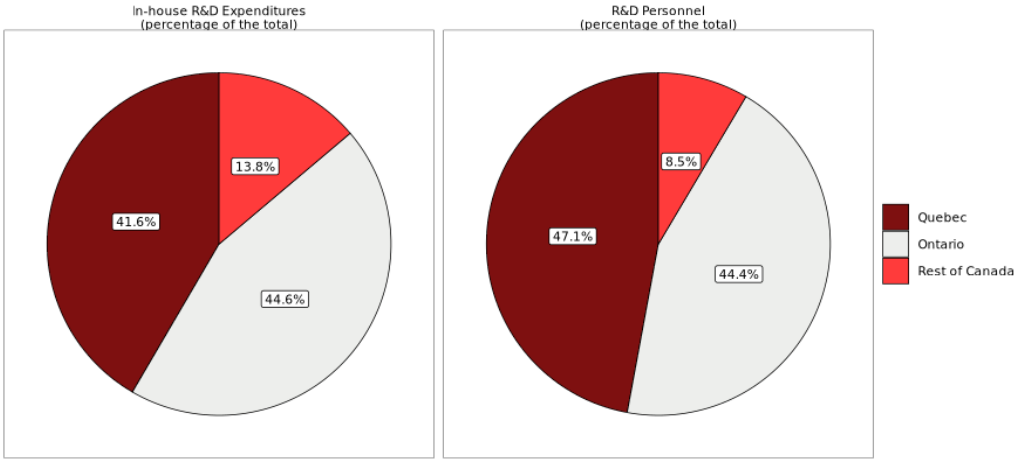
Note: IMC members' total jobs in R&D personnel were 5,767 FTEs, in 2023. Due to rounding, components may not add to the total.

From a regional perspective, Ontario and Quebec continued to serve as primary centres for employees of IMC member companies, collectively accounting for 91.5% of the workforce in 2023. Among the two provinces, Quebec experienced a decrease in the number of full-time equivalents (FTEs), declining from 2,889 to 2,716, whereas Ontario saw an increase from 2,337 to 2,560 FTEs.

Non-member organizations reported growth across all regions in 2023. The Rest of Canada recorded the most significant expansion, with FTEs increasing by 18.7% to 1,395. Quebec followed, showing a rise of 9.1% to 1,606 FTEs, while Ontario also experienced an increase, up 6.4% to 499 FTEs.

Figure 22
Share of in-house R&D expenditures and full-time equivalent jobs (FTEs) in R&D personnel by region, 2023

Innovative Medicines Canada



Note: IMC members' total jobs in R&D personnel were 5,767 FTEs, in 2023. IMC members' total in-house R&D expenditures were $1,160 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

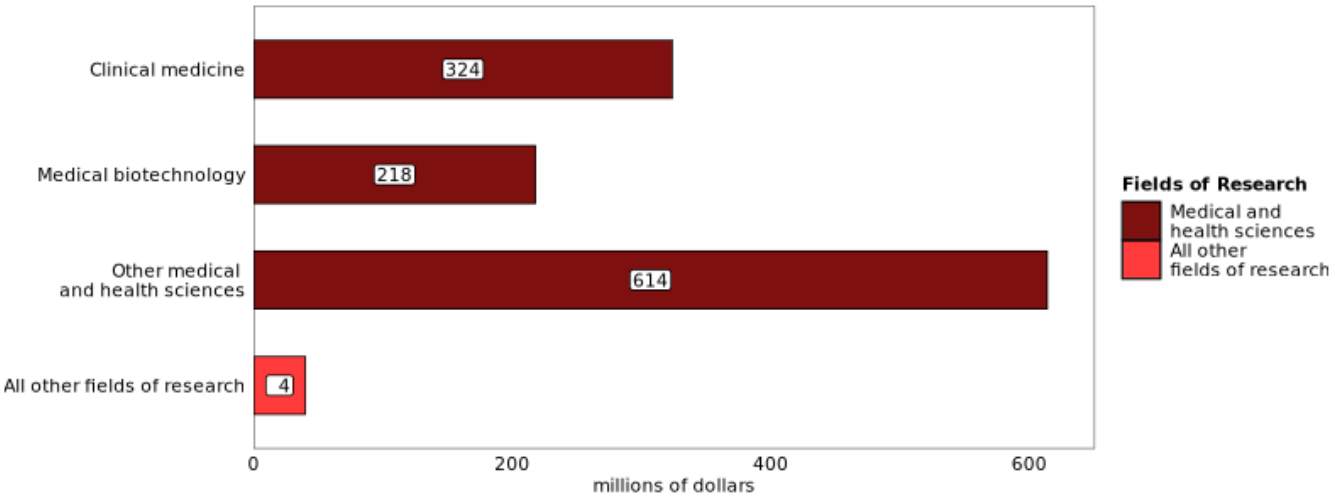
IMC members continue to prioritise clinical medicine while increasing investments in medical biotechnology

As noted previously, the medical and health sciences field of research is the primary area of focus for the Canadian R&D pharmaceutical sector, with clinical medicine and medical biotechnology serving as the key disciplines.

Clinical medicine remained the predominant discipline for IMC members; however, there was a slight reallocation of expenditure in 2023, with investments in clinical medicine decreasing from $409 million to $324 million, while allocations to medical biotechnology increased from $138 million to $218 million. Non-members predominantly directed their R&D expenditures toward medical biotechnology, which grew from $560 million to $576 million during the same period. Additionally, non-members experienced a notable rise in spending on clinical medicine, with expenditures increasing from $67 million to $118 million.

Figure 23
In-house R&D expenditures by field of research, 2023 (millions of dollars)

Innovative Medicines Canada



Notes: IMC members' total in-house R&D expenditure was $1,160 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Domestic financing of in-house expenditures by IMC members rose in 2023

In 2023, IMC members relied more heavily on international funding for their internal costs, though there was also a notable increase in domestic support that year. Domestic contributions rose by $94 million to reach $464 million, while foreign funding grew by $24 million, totalling $696 million.

For non-members, domestic and foreign funding levels were nearly equal. Domestic support declined by 18.2% to $426 million, whereas foreign funding rose sharply from $268 million to $409 million.

Innovative Medicines Canada members continued to prioritise research over experimental development

From a nature of research standpoint, IMC members allocated nearly three times more of their spending to research activities in 2023, which focus on generating or discovering new knowledge, than to experimental development, which leverages existing knowledge to enhance products or processes.

Notably, member spending on research increased by 15.2% in 2023, reaching $863 million. In contrast, non-members prioritized experimental development, with expenditures rising by 10.7% to $599 million.

3.2.3 Outsourced research and development expenditures

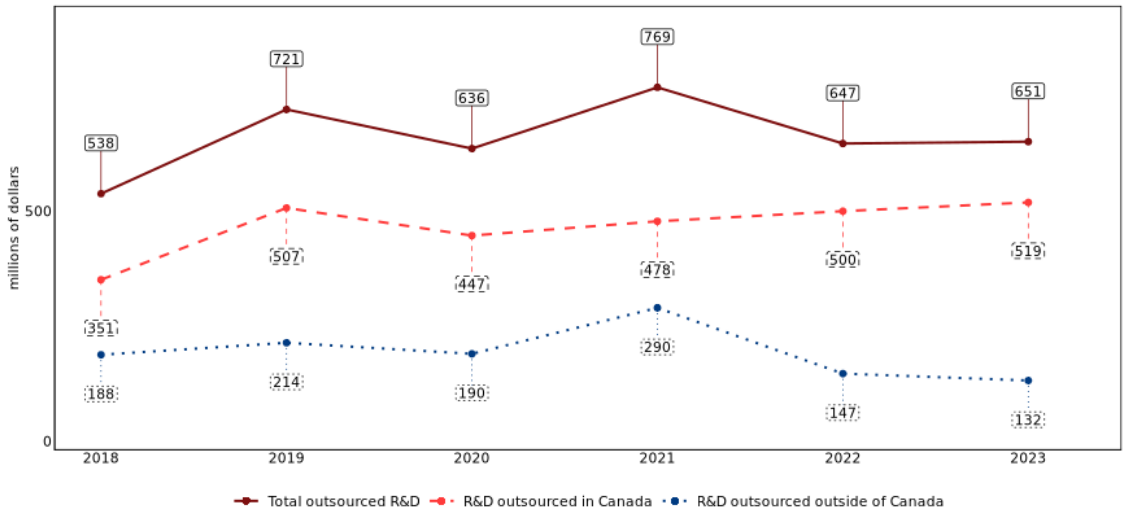
IMC members continue to outsource most of their R&D domestically

In 2023, IMC members increased domestic R&D outsourcing by 3.8% to $519 million, while foreign outsourcing fell 10.2% to $132 million.

In comparison, non-members generally direct outsourced R&D expenditures to foreign organizations. During the year, non-members outsourced $600 million in R&D overseas, marking a 17.2% increase from the previous year. Domestic outsourced R&D spending in Canada also experienced growth, rising from $179 million to $208 million.

Figure 24
Outsourced R&D expenditures by recipient, 2018-2023 (millions of dollars)

Innovative Medicines Canada

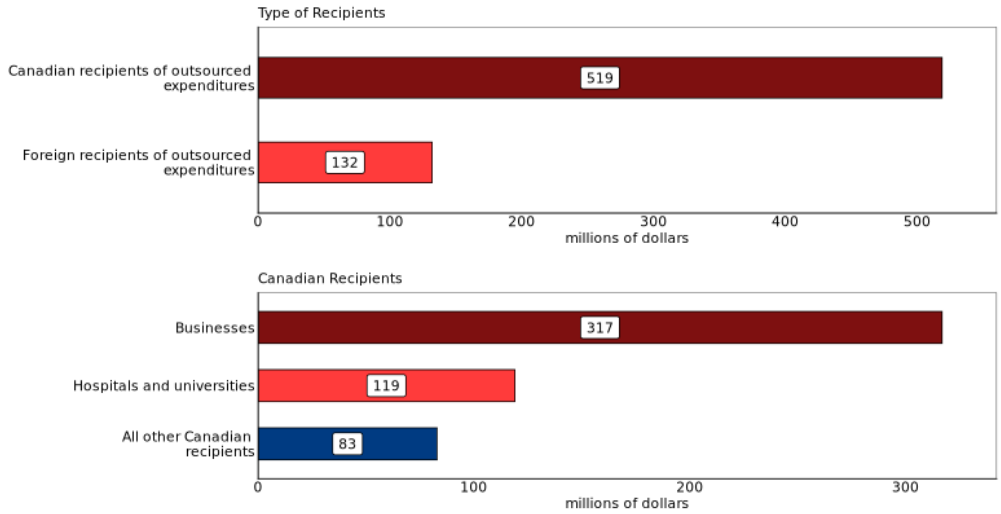


Note: Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

Domestically, businesses were the main recipients of outsourced R&D from members with expenditures rising 0.6% to $317 million. Domestic businesses also benefited from an increase in outsourced R&D from non-members, as expenditures rose 19.9% to $187 million.

Figure 25
Outsourced R&D expenditures by sector, 2023 (millions of dollars)

Innovative Medicines Canada



Note: IMC members' total outsourced R&D expenditures were $651 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

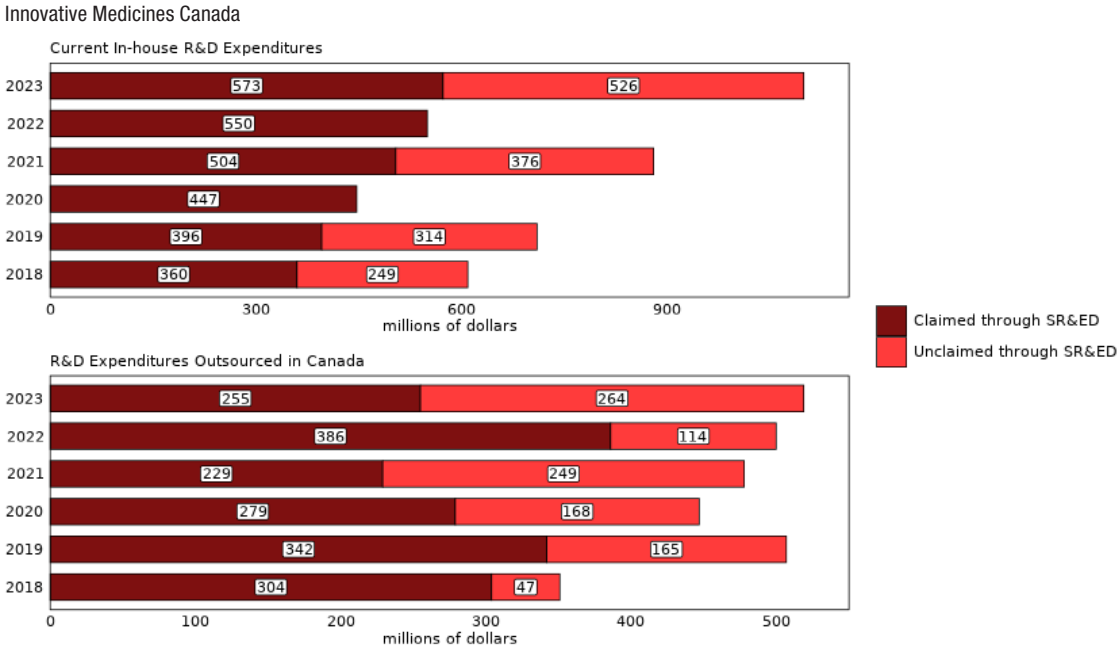
3.2.4 Research and development expenditures eligible for the Scientific Research and Experimental Development (SR&ED) Program

Consistent SR&ED Use by IMC Member Companies

IMC members represented 66.1% of the sector's total allowable SR&ED claims through the Canada Revenue Agency in 2023. Overall, members' allowable expenditures decreased from $936 million to $827 million. This decline resulted primarily from a decrease in allowable outsourced SR&ED expenditures within Canada, which dropped 33.9% to $255 million. The reduction was, however, partially offset by an increase in allowable in-house expenditures, which rose 4.2% to $573 million.

In 2023, non-members' allowable SR&ED expenditures increased from $299 million to $425 million, which was the result of increases in both SR&ED categories – allowable in-house expenditures (up 46.8% to $320 million) and allowable outsourced expenditures in Canada (up 26.8% to $104 million).

Figure 26
R&D expenditures claimed through SR&ED, 2018-2023 (millions of dollars)



Notes: The amount of eligible current in-house R&D expenses that were unclaimed through the SR&ED program in 2020 and 2022 cannot be calculated since IMC's total current in-house expenditures and total capital expenditures for 2020 and 2022 have been suppressed for reasons of confidentiality. IMC members' total current in-house R&D was $609 million in 2018, $710 million in 2019, $880 million in 2021 and $1,099 million in 2023. IMC members' total outsourced in Canada R&D expenditures was $351 million in 2018, $507 million in 2019, $447 million in 2020, $478 million in 2021, $500 million in 2022 and $519 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference years 2018-2023.

4 Limitations

This study series provides an analysis of the economic contribution of Canada's innovative R&D pharmaceutical sector, with a particular emphasis on reference year 2023. While the findings are robust, it should be noted that the series relies on financial and employment data reported by businesses, which may vary in accuracy and comparability. Potential coverage bias is present, as smaller biotechnology firms may be underrepresented. Additionally, the exclusive focus on economic indicators does not account for innovation outputs or broader social impacts, resulting in an incomplete representation of the sector's overall influence.

It is also important to note that the sector designation used herein does not align with any official industry classification; rather, it was developed specifically for this study by grouping businesses engaged in relevant activities.

5 Appendix

5.1 Glossary

The **Annual Survey of Research and Development in Canadian Industry (RDCI)** is an annual survey that collects R&D expenditures and personnel data used to monitor science and technology related activities of business and industrial non-profit organizations in Canada.

Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. See also **basic research; experimental development**.

Basic price is the amount a producer receives from a purchaser for a unit of a good or service produced as output minus any tax payable and plus any subsidy receivable as a result of its production or sale.

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. See also **applied research; experimental development**.

Business Enterprise Research and Development (BERD) is all research and development performed in Canada by the business enterprise sector, as measured by the Annual Survey of Research and Development in Canadian Industry performed by Statistics Canada.

Capital R&D expenditures are the annual gross amount paid for the acquisition of fixed assets that are used repeatedly or continuously in the performance of R&D for more than one year. They should be reported in full for the period when they took place, whether acquired or developed in-house, and should not be registered as an element of depreciation.

Country of control is the country of residence of the ultimate controlling parent corporation, family, trust, estate or related group. Each subsidiary within the global enterprise is assigned the same country of control as its parent. Country of control data are derived from ownership questionnaires filed annually with Statistics Canada by corporations subject to the *Corporations Returns Act*, and from information obtained from the Canada Revenue Agency's administrative records.

Current R&D expenditures are composed of labour costs and other current costs (including for external R&D personnel) used in R&D. Services and items (including equipment) used and consumed within one year are current expenditures. Annual fees or rents for the use of fixed assets should be included in current expenditures, as should overhead costs associated with R&D. See also **other current costs**.

Direct impacts are the effects directly attributed to an industry's production. See also **indirect impact; induced impact**.

An **economic footprint study** aims to measure the total economic impact (direct, indirect, or induced) of an organization, sector or industry on a specific country or region during a given period. Economic impacts typically considered include gross value added and employment data. See also **direct impact; indirect impact; induced impact**.

Employees are all persons who work in or for the reporting unit, who have a contract of employment with the unit and who receive compensation in cash or in kind at regular intervals of time.

Experimental development iis systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes. See also **applied research; basic research**.

Exports are goods produced or manufactured in Canada that are subtracted from the stock of material resources in Canada, as a result of their movement out of the country.

A **foreign-controlled company** is any company whose country of control is not Canada, see **country of control**.

Full-time equivalent (FTE) is the total hours worked divided by average annual hours worked in full-time jobs.

Full-time equivalent (FTE) R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group.

Gross Domestic Product (GDP) is the total unduplicated value of the goods and services produced in the economic territory of a country or region during a given period. See also **gross value added**.

Gross value added is a measure of the contribution that a producer, industry or sector makes to GDP, it is defined as the value of output less the value of intermediate consumption. See also **gross domestic product (GDP) and intermediate consumption**.

Harmonized System (HS) is an internationally standardized system of names and numbers used to classify traded products.

Imports are goods that have entered the country by crossing territorial (customs) boundaries, whether for immediate domestic consumption or for storage in customs warehouses. Re-imports are included in Canadian trade data. These are goods, materials or articles that are imported in either the same condition in which they were exported or after undergoing repair or minor alterations (e.g., blending, packaging, bottling, cleaning or sorting) that leave them essentially unchanged. Domestic re-imports are goods of Canadian origin, whether grown, extracted, or manufactured in Canada that are exported to another country and then returned to Canada in 'the same state' as they were sent out. See also **exports**.

Indirect impacts are upstream economic activities associated with supplying intermediate inputs (the current expenditures on goods and services used up in the production process) to the directly impacted industries. See also **direct impact; induced impact**.

Induced impacts are additional economic activities derived from the labour income generated by both the direct and indirect effects when spent in the market place. See also **direct impact; indirect impact**.

An **industry** iis a group of establishments engaged in the same, or similar, kinds of economic activity. See also **North American Industry Classification System (NAICS); sector**.

In-house R&D is expenditures within Canada for R&D performed within this business by employees or self-employed individuals or contractors who are working on site on a business's R&D projects.

Intermediate consumption is the products used by an industry to produce outputs. These products may come from domestic production or from imports. See **gross value added**.

Labour income consists of the sum of wages and salaries and employer's social contributions of employees and the labour income of the self-employed.

North American Industry Classification System (NAICS) is a business-classification system developed through a partnership among the United States, Mexico and Canada. Companies are classified by their same or similar production processes. NAICS Canada 2022 Version 1.0 divides the Canadian economy into 20 sectors, 99 subsectors, 323 industry groups, 695 industries and 922 Canadian industries. See also **sector; industry**.

Other current costs are non-capital purchases of materials, supplies, equipment and services to support R&D performed by the reporting unit in the reference year. Examples are water and fuel (including gas and electricity); books, journals, reference materials, subscriptions to libraries, scientific societies, etc.; imputed or actual costs of small prototypes or models made outside the reporting unit; and materials for laboratories (e.g., chemicals, animals, etc.). Other current costs include royalties or licences for the use of patents and other intellectual property rights, the lease of capital goods (machinery and equipment, etc.) and the rental of buildings to support R&D performed by the reporting unit in the reference year. Overhead costs associated with R&D are also included in other current costs. See also **current R&D expenditures**.

Output consists primarily of the value of goods and services produced by an industry.

Outsourced R&D are payments made within or outside Canada to other businesses, organizations or individuals to fund R&D performance through grants, fellowships, or contracts.

R&D personnel are all persons engaged directly in R&D, whether employed by the reporting unit or external contributors fully integrated into the reporting unit's R&D activities, as well as those providing direct services for the R&D activities (such as R&D managers, administrators, technicians and clerical staff).

The **reporting unit** is the unit **from which** data are reported. This corresponds to the unit that would receive a questionnaire or interview. In the case of administrative data, it would correspond to the unit that is represented by the individual record.

Research and development (R&D) is creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. See also **applied research; basic research; experimental development**.

Researchers are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques instrumentation, software or operational methods.

The **Scientific Research and Experimental Development (SR&ED) Tax Incentive Program** is intended to encourage Canadian businesses of all sizes and in all sectors to conduct R&D in Canada. These tax incentives come in three forms: an income tax deduction, an investment tax credit (ITC), and, in certain circumstances, a refund. Corporations, individuals, trusts and members of a partnership can use these Government of Canada incentives.

A **sector** is a high-level section of the economy encompassing economic activity in several related industry groups. See also **industry; North American Industry Classification System (NAICS)**.

5.2 Populations

The study series began in 2018, with Innovative Medicines Canada submitting lists of its members and peer pharmaceutical companies focused on developing new medicines and treatments to Statistics Canada. Additional firms, mainly specializing in human medicine and health sciences, were added from the survey by Statistics Canada to ensure comprehensive sector coverage. These lists excluded generic manufacturers, wholesalers without R&D in Canada, pure medical device makers, and veterinary-focused entities. Statistics Canada confirmed that every unit was part of the Annual Survey of Research and Development in Canadian Business so that it would be possible to obtain valuable statistical insights from the data.

These confidential lists have remained stable since the first 2018 reference year study.

5.3 Business structures

For collection purposes, Statistics Canada distinguishes between four different business levels, all of which are present in all businesses in Canada. These levels, from highest to lowest, are enterprise, company, establishment, and location. For simple businesses, particularly those where all business activities are based in one location, there are no practical differences between the four levels. Statistics Canada recognizes that complex businesses, which may haves a head office and separate locations for regional offices, R&D, manufacturing, sales, etc., produce and record different types of information at different levels within the business. Therefore, different levels of entities are surveyed depending on the nature of the data being sought.

This study pulled data from several different Statistics Canada business surveys, which surveyed companies at different business levels. The cohort lists provided to Statistics Canada were at the company level. Statistics Canada linked entities at the company level to those at the establishment or enterprise levels, depending on the suitable conceptual level for the data.

Data on gross value added and employment, and all associated impacts – direct, indirect and induced – were processed at the establishment level, the lowest level at which accounting data required to measure production is available.

Tax data are processed by the Canada Revenue Agency at the business number level, which generally corresponds to the company level. Since many companies that perform R&D report Scientific Research and Experimental Development (SR&ED) tax credit claims, R&D data are collected at the same level as tax data to reduce response burden by enabling reporting units to use the same accounting level for reporting R&D.

Trade and financial data are collected at the enterprise level, the highest level within the business structure. This is the level at which businesses keep these types of records.

Where a complex enterprise has a company which is part of the R&D pharmaceutical sector and another company which is not, both companies are included by virtue of the business organizations reporting structure.

5.4 Methods

Where microdata were provided, analysts undertook a data review to confirm the suitability of the data for use in this report. As a result, one enterprise record was modified to include only business activities in Canada.

The R&D data were comprised primarily of actual respondent data. For more information on data sources, accuracy, and methodology of the RDCI survey please refer to the Integrated Metadatabase, the metadata repository for Statistics Canada products.

5.4.1 Economic impacts

The direct economic impacts of the Canadian R&D pharmaceutical sector were measured on the basis of the sector's outputs and gross value added. Outputs include the measurement of goods and services produced by an establishment. Gross value added measures the value of output less the value of intermediate consumption, which consists of all goods and services used up in the course of production within an accounting period.

The calculation of the economic impacts was derived using the 2018 through 2023 tax data associated with the companies and enterprises identified as members of the IMC, as well as the overall sector. This information was entered into the Statistics Canada Input-Output Model Simulations (Statistics Canada service 36-23-0002) which provided estimates for the other direct impact metrics such as labour income, jobs and FTEs, as well as the indirect and induced economic impact for all variables.

The Statistics Input-Output Model Simulations is derived from the Supply and Use Tables (Statistics Canada catalogue 15-602-X). The model is updated every year to coincide with the most recent version of the Supply and Use Tables. The Input-Output model used in the economic impact study is based on the 2022 version of the Supply and Use tables.

The impact estimates provided by the model for output, gross value added and labour income are derived from information included in the Supply and Use Tables. The impact estimates provided by the model for jobs and FTEs are derived from the labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts (Statistics Canada table 36-10-0480-01).