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Analysis in Brief

The Canadian Medical Devices Manufacturing Sector, 2023

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Background

Medtech Canada, the national association that represents medical technology manufacturers, commissioned this study to assess the economic impact of the Canadian medical devices manufacturing sector on the national economy for 2023.¹

The study uses a comprehensive set of indicators that include concepts such as direct, indirect and induced value added, research and development, job creation, and trade performance.

The results indicate that the sector contributed a total gross value added of \$13.7 billion in 2023, comprising \$7.3 billion from direct impacts, 53.4% of the sector's total value added, \$3.0 billion (22.2%) from indirect impacts, and \$3.3 billion (24.4%) from induced impacts. Canada-wide employment totaled 88,394 full-time equivalent (FTE) positions and research and development expenditures were estimated between \$404 million and \$445 million, with 84.9% allocated to experimental development. International trade activity was also significant, with the United States identified as the leading trading partner for exports.

The content of this study, which includes the selection of units and variables, definition of the study population, and contextual analysis of the results, was conducted independently by Statistics Canada.

Acknowledgments

The authors would like to acknowledge the valuable feedback and contributions of Thomas Wood, Charlene Lonmo, and Susan Demedash.

1. More information on [Medtech Canada](http://www.medtechcanada.org) can be found at www.medtechcanada.org.

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The Canadian Medical Devices Manufacturing Sector, 2023

by Gregory Maloney, Mohammad Huda and Norma Abou-Eid

Introduction

This study examines the Canadian medical devices manufacturing sector's contribution to the national economy in 2023. It draws on Statistics Canada's business data to generate a broad set of economic indicators, including direct, indirect, and induced impacts, as well as research and development, employment, and trade performance. Additional financial indicators, such as operating revenue and expenses, and assets and liabilities, are added to show the sector's financial position.

The Canadian medical devices manufacturing sector encompasses diverse businesses which contribute to the development of diagnostic technologies and surgical instruments. The sector's impact is amplified by its strong linkages to other industries. It draws on inputs such as specialized materials, advanced manufacturing techniques, and digital technologies, while its outputs extend into areas including product distribution, integration into clinical settings, and ongoing service and support. This interconnectedness also enables collaboration with research institutions and healthcare providers.

Complementing these relationships, businesses in the sector actively invest in in-house research and development (R&D), which leads to the advancement of medical technologies, cultivates a skilled workforce and stimulates regional economic growth.

1. Study population

The term "Canadian medical devices manufacturing sector" is a generic designation developed for the purposes of this study. The name was chosen to reflect the core operations of most businesses in the study population, which correspond to NAICS² code 33911. This classification predominantly encompasses manufacturers of medical equipment and supplies.

Statistics Canada expanded the study population to include organizations with core operations under various NAICS codes that also conduct activities connected to medical device manufacturing. These included firms engaged in research and development within the physical, engineering, and life sciences (NAICS 541710), merchant wholesalers who focus on professional machinery, equipment, and supplies (NAICS 417930), and businesses that produce measuring, medical, and controlling devices (NAICS 334512).

A two-step process was used to identify businesses within the additional NAICS. First, the Medical Devices Establishment License Listing (MDEL) and Medical Devices Active Licence Listing (MDALL) databases from Health Canada were used to cross-reference with businesses classified under the additional NAICS codes for the purpose of identifying sector participation. MDEL lists establishments authorized to manufacture Class I devices or import/distribute any class of device in Canada, while MDALL provides information on licensed Class II-IV medical devices.³ Next, businesses were matched with Statistics Canada's Business Register to determine their structure, applicable NAICS codes, and taxation data.⁴ For those identified, Statistics Canada determined what percentage of their activities pertained to medical device manufacturing.

In total, the study population consisted of 3,361 enterprises.

2. The North American Industry Classification System (NAICS) is a standardized framework used to classify businesses and industries in Canada, the United States, and Mexico based on their core business operations.

3. For more information on these publicly available databases, please consult the following links: [Medical Devices Active Licence Listing \(MDALL\)](#), [Medical Devices Establishment Licence \(MDEL\) Listing](#)

4. The [Business Register](#) is Statistics Canada's central repository for information on Canadian businesses, used primarily to support economic surveys. The register provides detailed and structured information on all active businesses in Canada.

2. Economic footprint

2.1 Value added and output

A sector’s significance in the economy can be evaluated by analyzing its gross value added (GVA) and output.

Value added represents the net contribution of a sector to Gross Domestic Product (GDP) by capturing the ‘new’ value created through production, after accounting for the cost of intermediate goods and services. As the core component of GDP, GVA is a direct and reliable indicator of economic impact.

By contrast, output reflects the total value of goods and services produced by the sector. While it includes intermediate consumption, it offers important insight into the scale and complexity of economic activity, helping contextualize the sector’s footprint within supply chains and markets.

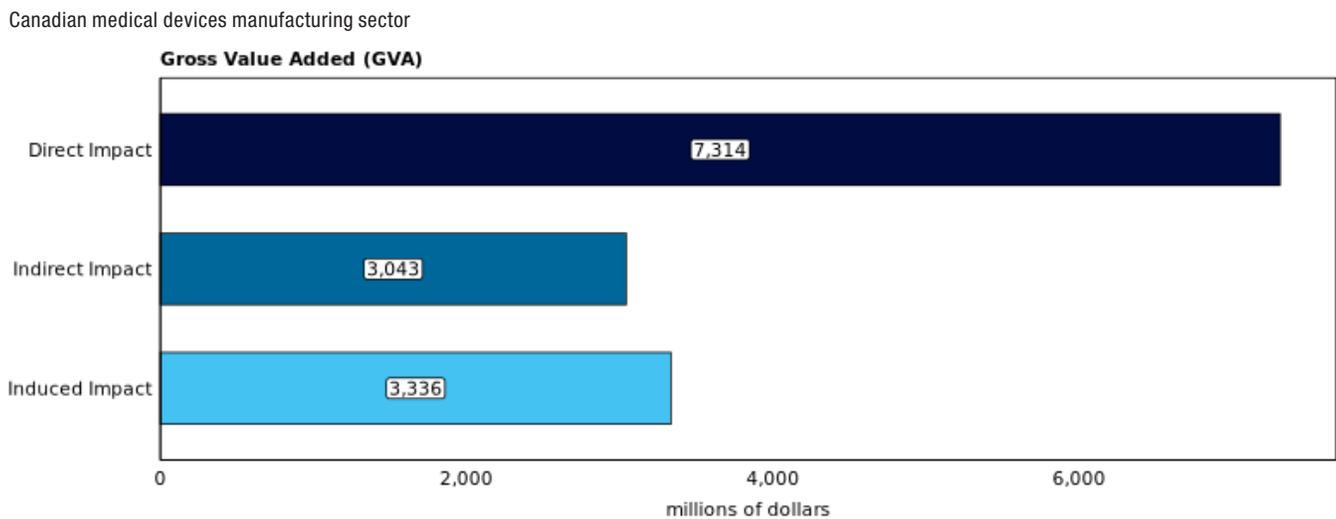
Together, these measures serve as tools to evaluate both the depth (value added) and breadth; (output) of a sector on the economy.

2.1.1 Value added

In 2023, the Canadian medical devices manufacturing sector contributed \$13.7 billion in gross value added (GVA). This contribution includes direct impacts from production and employment, indirect impacts from spending on intermediate goods and services, and induced impacts from labour income circulating through the broader economy.

A breakdown of the impacts shows that direct impacts were \$7.3 billion, making up 53.4% of GVA. Indirect impacts came to \$3.0 billion, representing 22.2%, and induced impacts were \$3.3 billion at 24.4%.

Figure 1
Gross value added (GVA), 2023 (millions of dollars)



Note: The Canadian medical devices manufacturing sector’s total GVA was \$13,693 million in 2023. Due to rounding, components may not add to the total.

Source: Statistics Canada, custom tabulation, reference year 2023.

Value added spread across the country

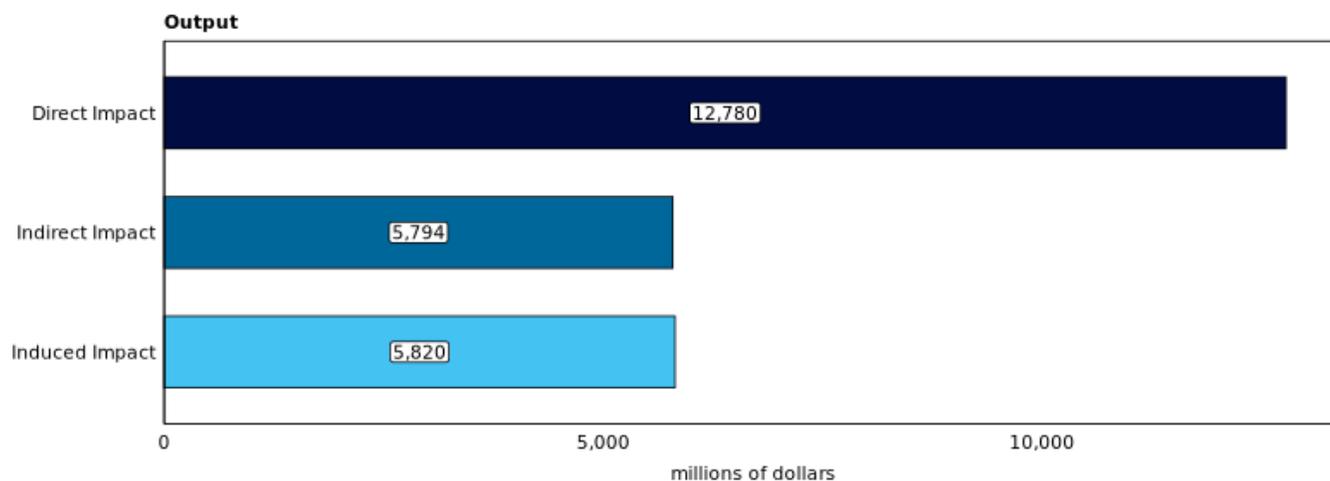
Value added within the sector was generated in all provinces and territories across Canada. Ontario contributed nearly two thirds (61.1%) of the total value added, amounting to \$8.4 billion. Quebec ranked second with 19.3% at \$2.6 billion, followed by British Columbia and the Territories combined, which accounted for 8.9% at \$1.2 billion.

2.1.2 Output

The Canadian medical devices manufacturing industry's output totaled \$24.4 billion in 2023. Direct impacts accounted for 52.4% of total output (\$12.8 billion), while indirect and induced impacts contributed 23.8% (\$5.8 billion) and 23.9% (\$5.8 billion), respectively.

Figure 2
Total output, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: The Canadian medical devices manufacturing sector's total output was \$24,394 million in 2023. Due to rounding, components may not add to the total.

Source: Statistics Canada, custom tabulation, reference year 2023.

Output reflected nationwide

On a provincial basis, Ontario was the largest contributor at 58.8% (\$14.3 billion), followed by Quebec with 22.2% (\$5.4 billion), and British Columbia together with the Territories at 8.6% (\$2.1 billion).

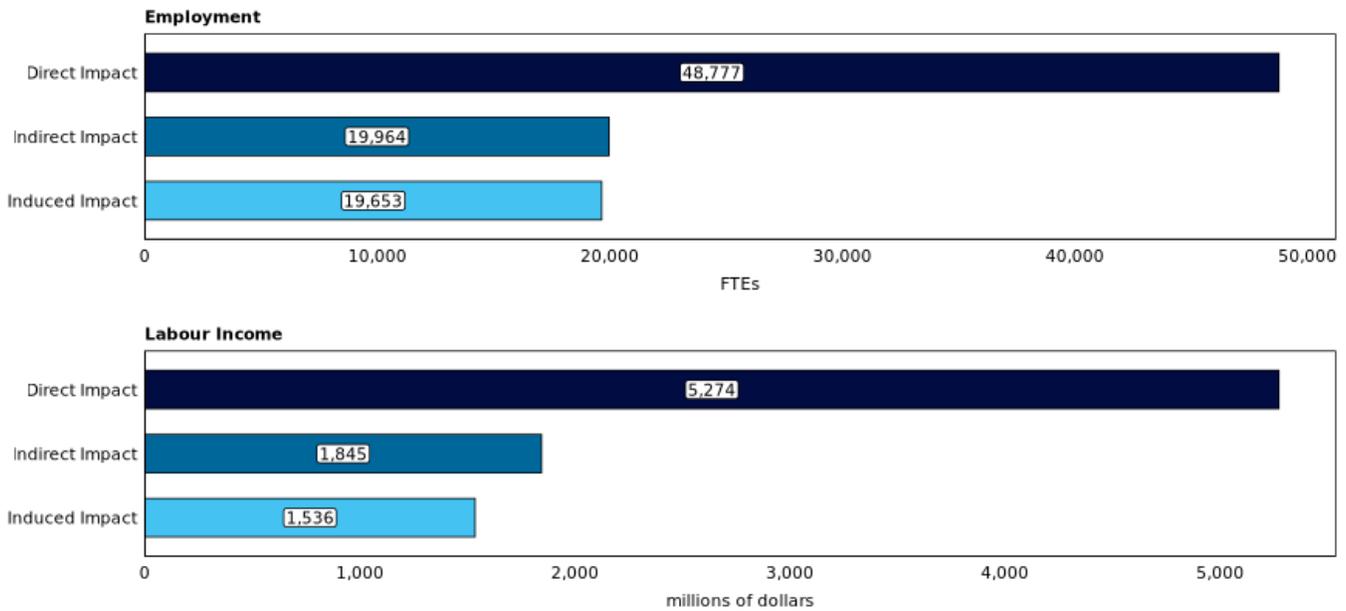
2.2 Employment and labour income

In 2023, the sector employed 88,394 full-time equivalent positions (FTEs), which includes full-time, part-time, and seasonal workers. Direct economic impacts comprised 55.2% (48,777 FTEs) of the total, while indirect impacts represented 22.6% (19,964 FTEs) and induced impacts accounted for 22.2% (19,653 FTEs).

Across Canada, Ontario had the highest FTE employment at 50,910 (57.6%), followed by Quebec with 19,429 (22.0%), and British Columbia together with the Territories at 9,116 (10.3%).

Figure 3
Employment (FTEs) and labour income (millions of dollars), 2023

Canadian medical devices manufacturing sector



Note: The Canadian medical devices manufacturing sector's total jobs were 88,394 FTEs, and total labour income was \$8,655 million in 2023. Due to rounding, components may not add to the total.

Source: Statistics Canada, custom tabulation, reference year 2023.

Total labour income for the sector in 2023 was \$8.7 billion. This figure comprises wages, salaries, employers' social contributions for employees, and income accrued by self-employed individuals. Most of the labour income arose from direct impacts (60.9%) at \$5.3 billion, followed by indirect impacts (21.3%) at \$1.8 billion, and induced impacts (17.7%) at \$1.5 billion.

Consistent with employment distribution patterns, Ontario accounted for 61.5% (\$5.3 billion), Quebec represented 20.4% (\$1.8 billion), and British Columbia and the territories comprised 9.1% (\$789 million).

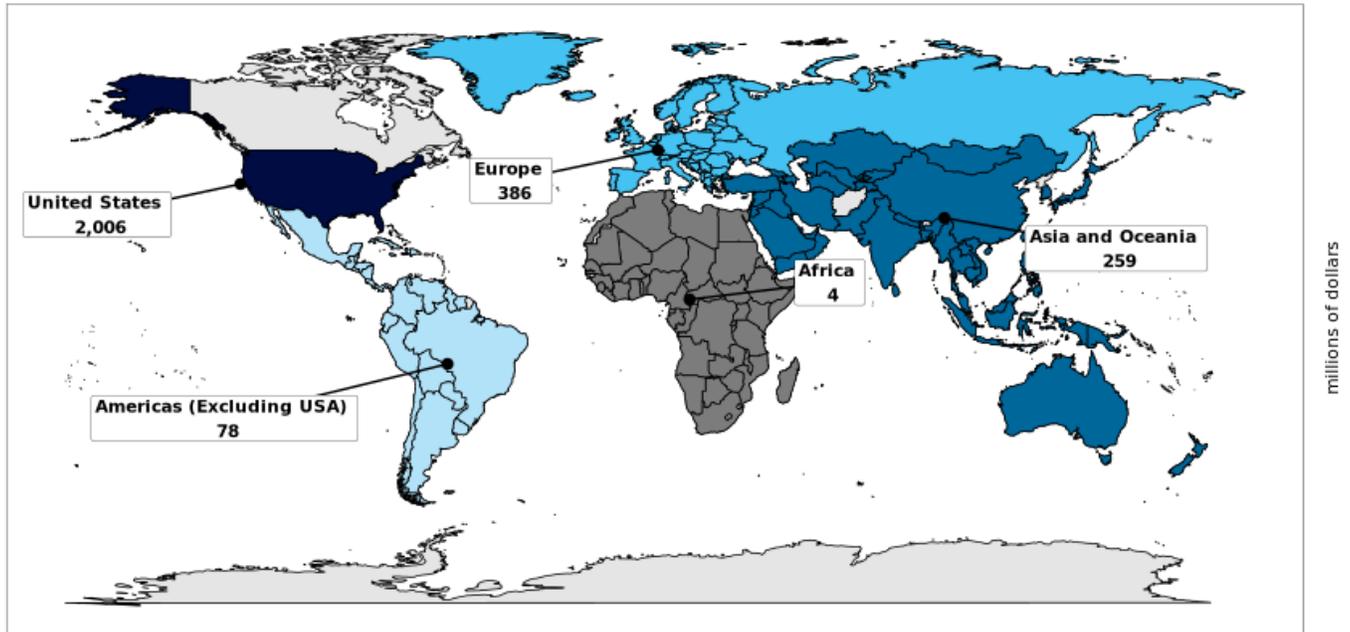
2.3 Trade

The Canadian medical devices manufacturing sector is well integrated into global trade, engaging in both export and import activities to meet domestic healthcare and industrial needs. In 2023, the sector exported to 141 countries and imported from 169 countries. Notably, about half (46.9%) of exporting firms operated across multiple international markets.

Exports totalled \$2.7 billion in 2023, with the United States being the largest export market (\$2.0 billion) for the sector's goods.

Figure 4
Total value of goods exports by region, 2023 (millions of dollars)

Canadian medical devices manufacturing sector

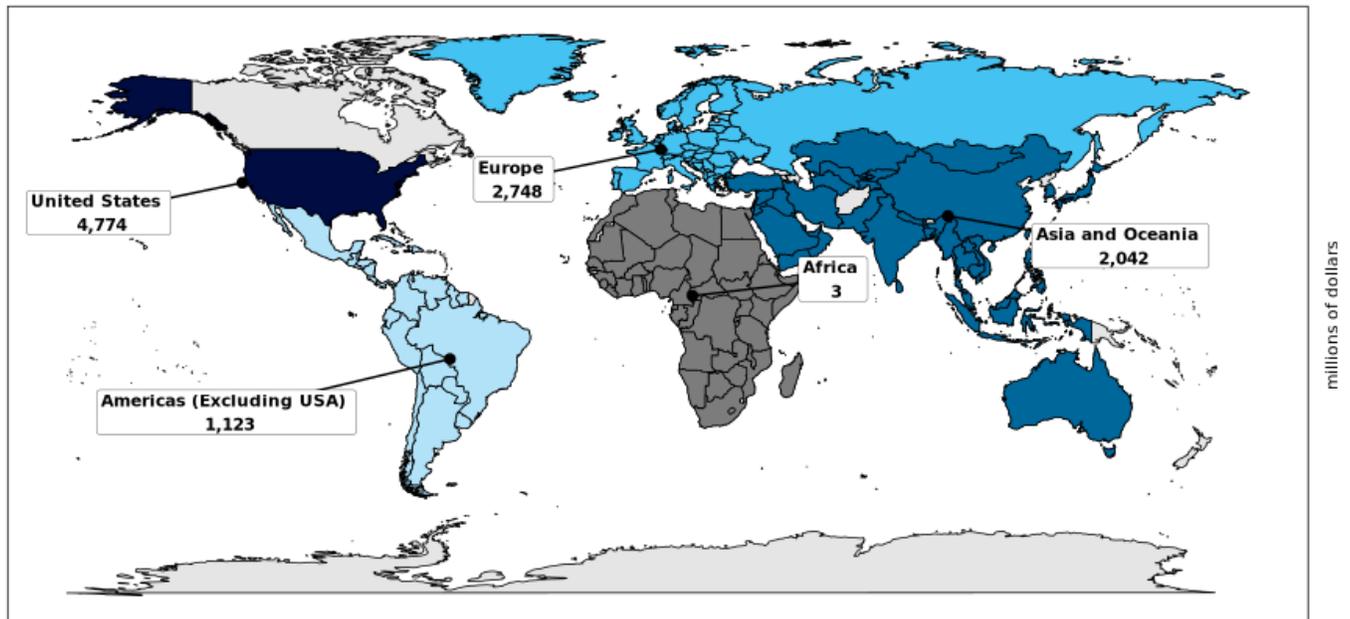


Note: The Canadian medical devices manufacturing sector's total goods exports was \$2,733 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Imports totalled \$10.7 billion in 2023, with the US again being the primary market (\$4.8 billion).

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

Canadian medical devices manufacturing sector

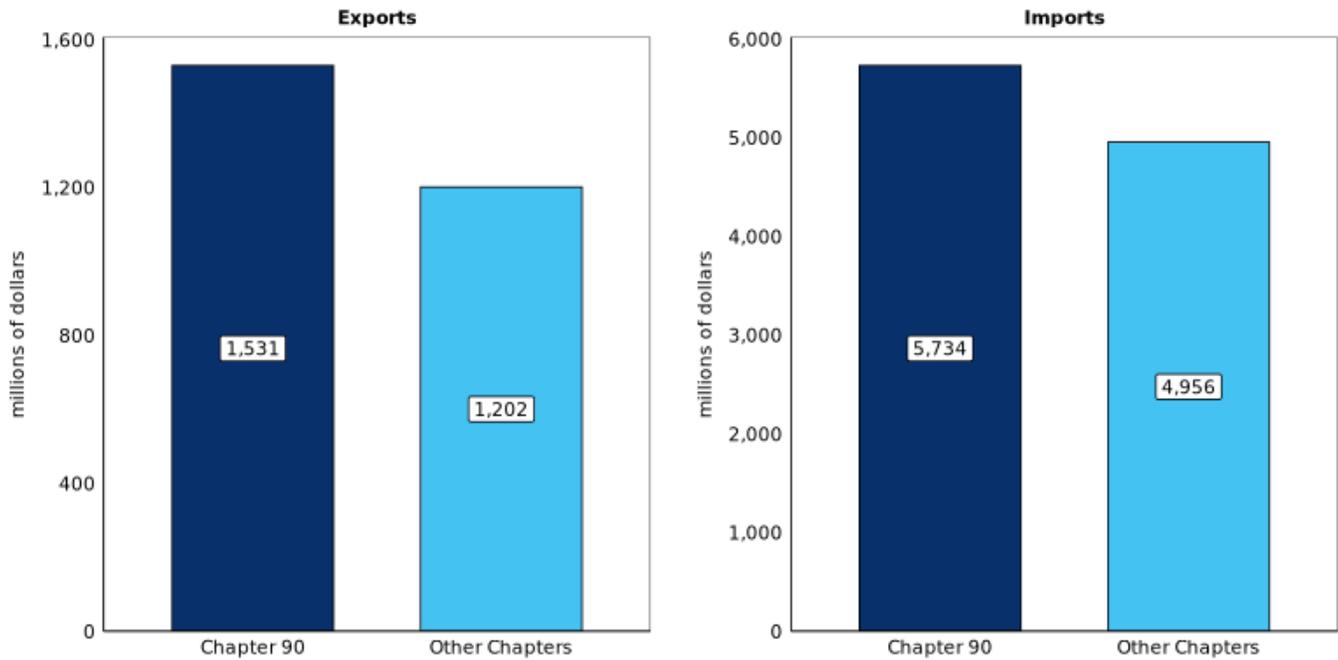


Note: The Canadian medical devices manufacturing sector's total goods imports was \$10,689 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

According to the Harmonized System (HS) used for classifying traded goods, more than half of the exports and imports in the sector were categorized under Chapter 90, which encompasses optical, photographic, and medical instruments. Specifically, HS 90 exports constituted 56.0% (\$1.5 billion) of total exports, while HS 90 imports comprised 53.6% (\$5.7 billion) of total imports.

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

Canadian medical devices manufacturing sector



Note: The Canadian medical devices manufacturing sector's total exports were \$2,733 million, while goods imports were \$10,689 million in 2023. Due to rounding, components may not add to the total.

Source: Statistics Canada, custom tabulation, reference year 2023.

3. Research and development

The Canadian medical devices manufacturing sector engages in research and development (R&D) by incorporating technologies such as microelectronics, advanced materials, biotechnology, and artificial intelligence (AI) to create new or improved medical devices. The sector's R&D initiatives are driven by several key factors, such as demographic shifts due to an aging population, an increasing rate of chronic diseases, and the need for readiness for potential future pandemics.⁵

3.1 Measuring research and development

Research and development (R&D) expenditures for the Canadian medical devices manufacturing sector were collected through Statistics Canada's Annual Research and Development in Canadian Industry (RDCI) survey. The RDCI is the primary source of information on R&D activities among Canadian companies and industrial non-profit organizations, as it provides detailed data on expenditures, personnel, and funding sources across all industries. The measurement of R&D in the survey is based on international standards set out in the Frascati Manual produced by the Organisation for Economic Cooperation and Development (OECD).⁶

5. OECD. *The Future of Health Systems*. Paris: OECD Publishing, 2023.

6. Under the Frascati Manual, R&D covers basic research, applied research, and experimental development across all industry sectors, accounting for both current and capital expenditures. By contrast, the Canada Revenue Agency defines R&D for tax purposes under the Scientific Research & Experimental Development program, emphasizing systematic efforts to achieve technological advancement and primarily considering wages and materials as eligible costs. Because the definitions differ, R&D expenditures will inevitably vary between the two sources.

R&D expenditures reported in the RDCI survey are categorized as either in-house or outsourced activities. In-house R&D refers to research performed by the organisation, encompassing costs such as salaries, materials, and equipment, which reflect internal innovation capabilities. Outsourced R&D refers to funding allocated to external entities—such as universities and partner companies—to conduct research on behalf of the organization. Together, these strategies enable businesses in Canada to leverage both internal expertise and external partnerships to drive innovation.

3.2 Sector research and development expenditures

To avoid double counting due to domestic outsourcing, Statistics Canada reports total R&D expenditures as a range, providing both lower and upper bounds. This approach accounts for cases where one company funds R&D and another performs it, potentially leading both to report the same activity.

To address this reporting issue, the lower bound encompasses both internal R&D activities as well as outsourcing to international partners, whereas the upper bound incorporates all outsourced expenditures, including those incurred domestically and internationally.

Overall, the total R&D expenditures by the sector were estimated to range between \$404 million to \$445 million.

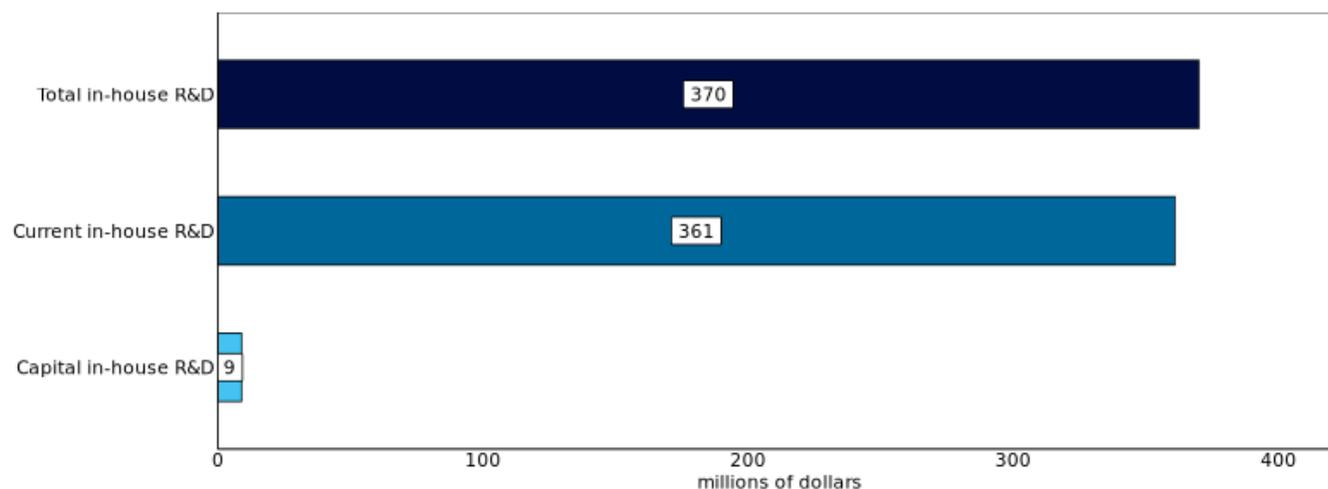
In-house research and development expenditures

In 2023, the sector spent \$370 million on in-house R&D.

In-house expenditures can be further categorized into current and capital expenditures. Current expenditures totaled \$361 million, making up 97.6% of overall in-house costs.

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

Canadian medical devices manufacturing sector

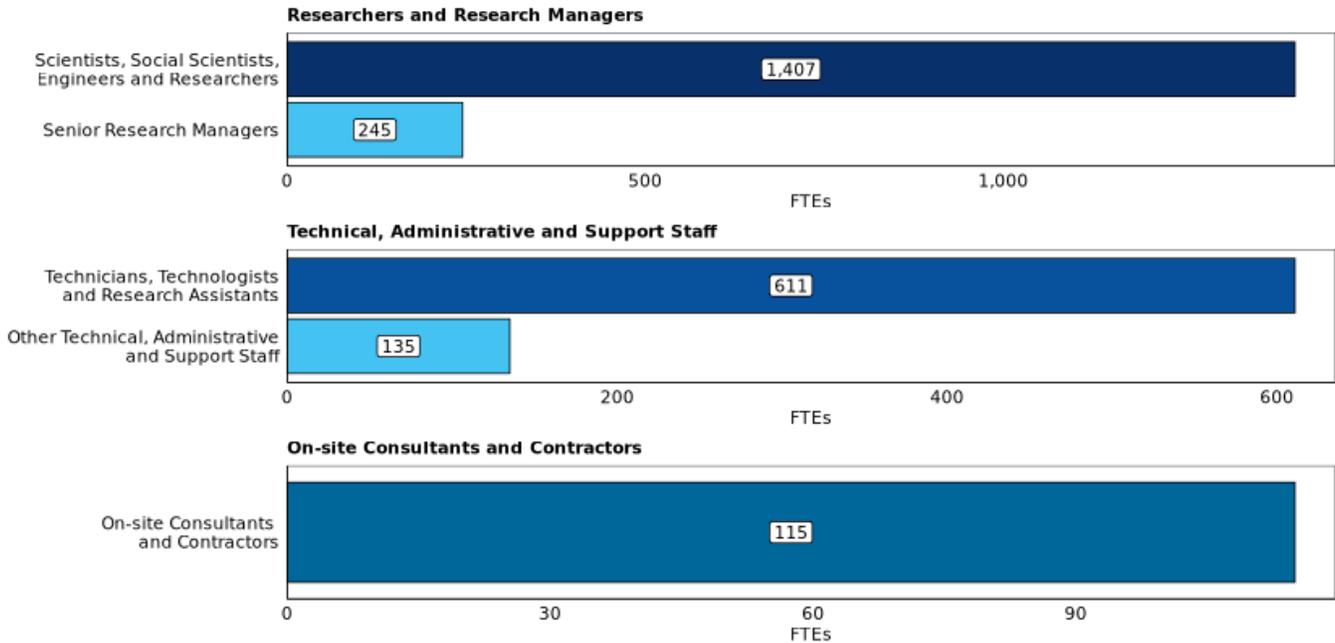


Note: The Canadian medical devices manufacturing sector's total in-house R&D expenditure was \$370 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Wages and salaries represented the largest share of current in-house expenses, totalling \$226 million in 2023. This expense supported a workforce of 2,513 FTEs, comprised of researchers and research managers (1,652 FTEs), technical, administrative and support staff (746 FTEs), and on-site consultants and contractors (115 FTEs). The majority of personnel were scientists, social scientists, engineers and researchers (1,407 FTEs).

Figure 8
Full-time equivalent jobs (FTEs) in R&D personnel by occupation, 2023

Canadian medical devices manufacturing sector



Note: The Canadian medical devices manufacturing sector's total R&D personnel were 2,513 FTEs in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Additional current expenditures, which included R&D support services, materials, and other related costs, amounted to \$134 million.

Capital expenditures, which refer to investments in fixed assets utilized in the organisation's operations or leased to third parties, comprised the remaining 2.4% (\$9 million) of overall in-house expenditures.

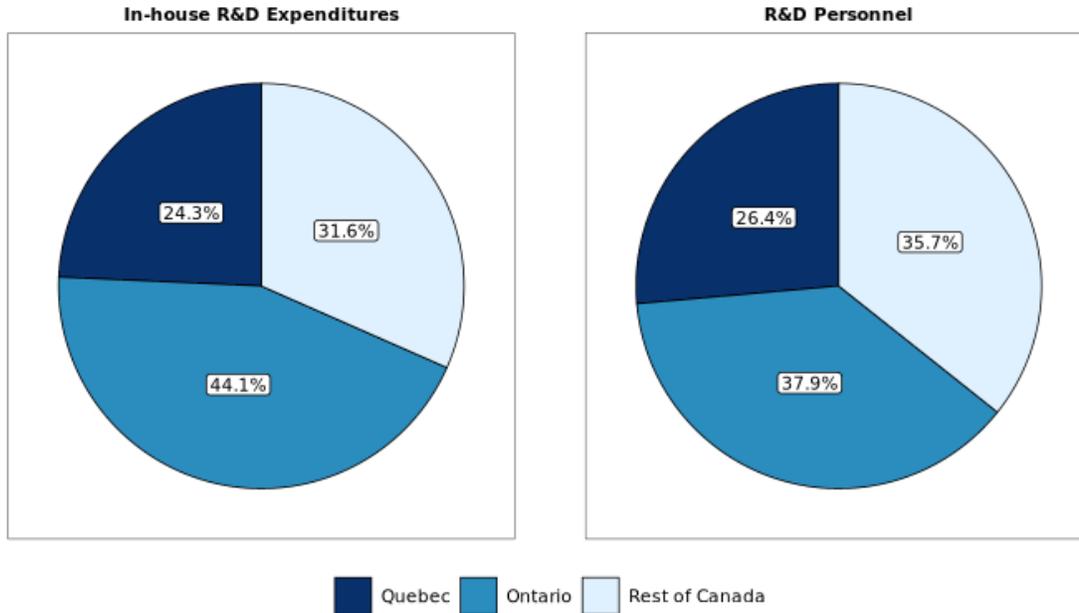
3.3 Regional distribution of in-house R&D expenditures and personnel

Ontario accounted for 44.1% (\$163 million) of in-house R&D expenditures, Quebec for 24.3% (\$90 million) and the rest of Canada for 31.6% (\$117 million).⁷ A similar ranking was observed in full-time equivalent (FTE) R&D personnel: Ontario employed 37.9% (952 FTEs), Quebec comprised 26.4% (664 FTEs), and the rest of Canada represented 35.7% (898 FTEs).

7. The subnational R&D breakdowns differ from those in other sections of the report due to confidentiality constraints.

Figure 9
Share of in-house R&D expenditures and full-time equivalent jobs (FTEs) in R&D personnel by region, 2023

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total in-house R&D expenditure was \$370 million and total R&D personnel were 2,513 FTEs in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

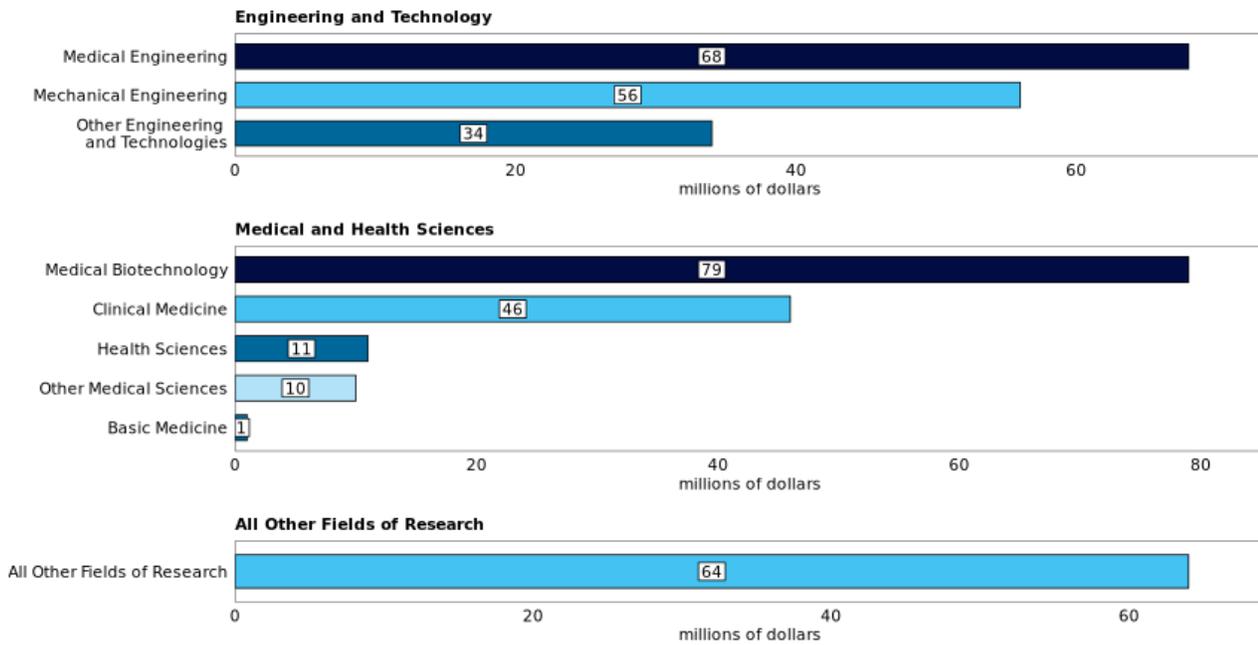
3.4 Fields of research

R&D spending is classified into six main fields in accordance with the guidelines established by the Frascati Manual: Natural Sciences, Engineering and Technology, Medical and Health Sciences, Agricultural and Veterinary Sciences, Social Sciences, and Humanities. Each of these fields comprise various subcategories.

In-house R&D expenditures by the Canadian medical devices manufacturing sector spanned most of the core fields. However, spending was primarily allocated to engineering and technology (\$159 million), with an emphasis on medical and mechanical engineering; and medical and health sciences (\$146 million), with a focus on medical biotechnology and clinical medicine.

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

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total in-house R&D expenditure was \$370 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

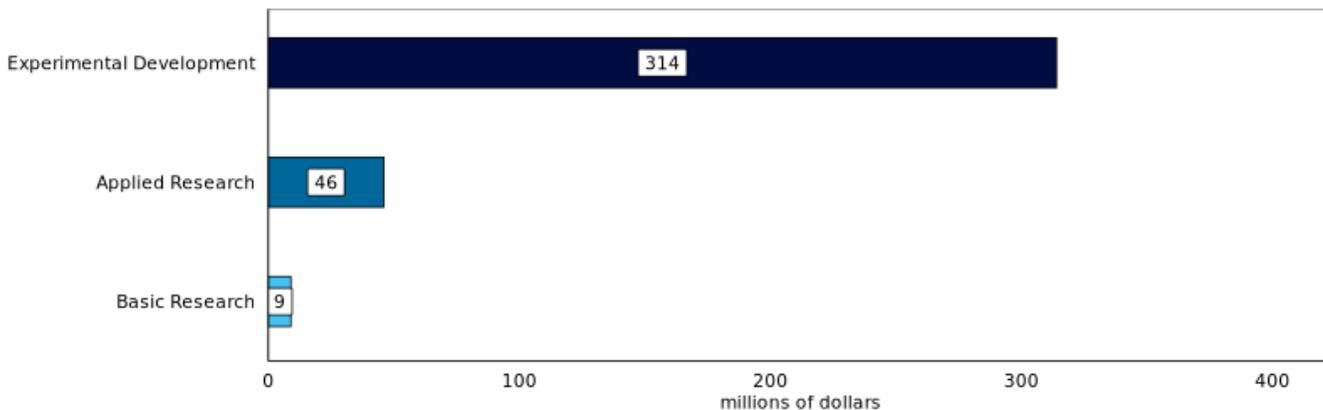
3.5 The nature of R&D work

The type or nature of research work for businesses is a key factor in how research activities are leveraged and applied. The nature of research is structured according to 3 approaches – basic research, applied research and experimental development. Basic research involves gaining new knowledge without a specific practical application in mind. Applied research aims to solve a specific, practical problem using existing knowledge. Finally, experimental development aims to create or improve products, processes, or technologies.

Almost eighty-five percent of the sector's in-house R&D expenditures in 2023 were allocated to experimental development, totaling \$314 million. Applied research represented \$46 million of spending and basic research accounted for \$9 million.

Figure 11
In-house R&D expenditures by nature of expenditure, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total in-house R&D expenditure was \$370 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

3.6 Source of funds for R&D expenditures

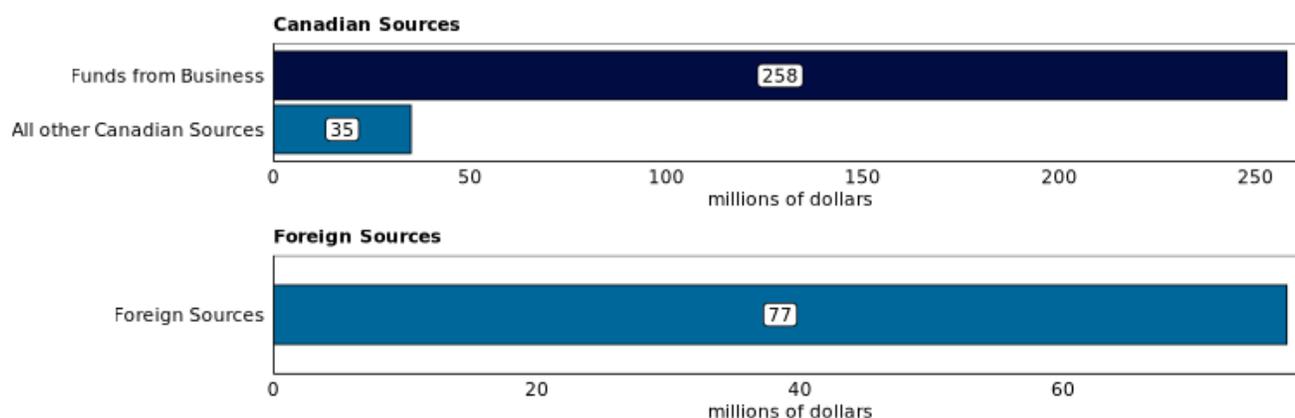
The source of R&D funding is also an important factor that reveals the extent to which innovation is supported by domestic versus foreign stakeholders. This distinction helps inform policy and investment decisions by highlighting national capacity and international engagement in research efforts.

Total funds from domestic sources amounted to \$293 million in 2023, which comprised 79.2% of overall in-house expenditures in the sector. Most of this expenditure was self-funded by the businesses (\$229 million).

International sources contributed the remaining 20.8% of in-house expenditures, totalling \$77 million.

Figure 12
In-house R&D expenditures by source of funds, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total in-house R&D expenditure was \$370 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

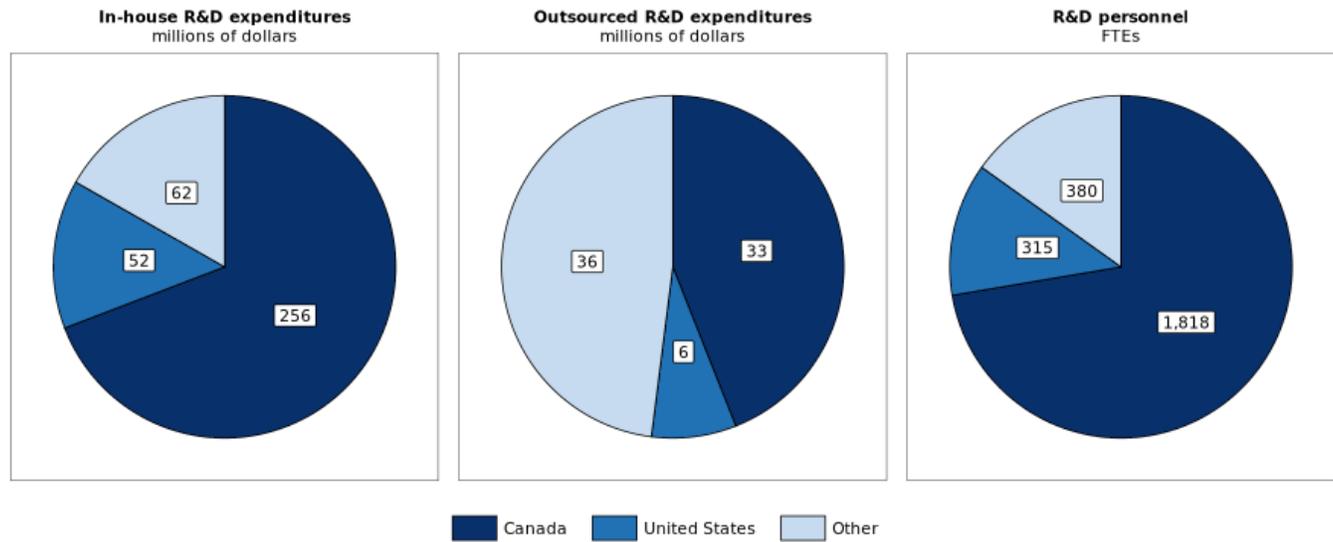
3.7 R&D country of control

Canadian-controlled enterprises within the Canadian medical devices manufacturing sector accounted for 69.2% of in-house R&D expenditures (\$256 million) in 2023. The remaining 30.8% (\$114 million) of expenditures were made by foreign-controlled corporations, with 45.6% of this portion originating from entities based in the United States.

Within the sector, Canadian-owned businesses accounted for 72.3% of total FTEs (1,818), while the remaining 695 FTEs were employed by foreign-owned enterprises operating in Canada. Among those working for foreign-controlled firms, approximately 45.3% were employed by organizations headquartered in the United States.

Figure 13
R&D expenditures by country of control, 2023

Canadian medical devices manufacturing sector



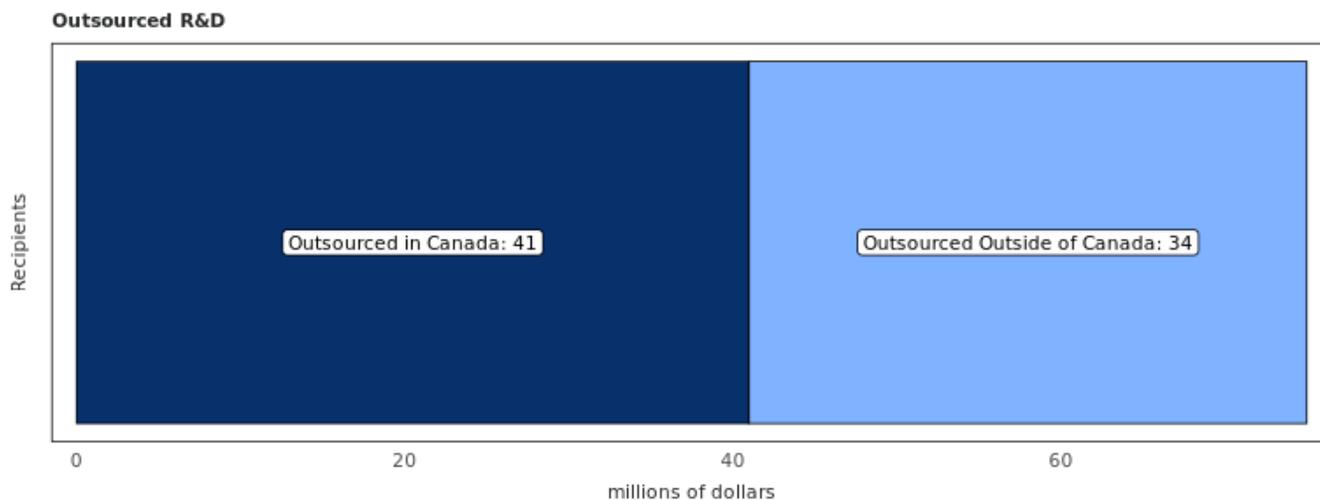
Note: The R&D medical devices manufacturing sector's total in-house R&D expenditure was \$370 million, total outsourced R&D expenditure was \$75 million and total R&D personnel were 2,513 FTEs in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

3.8 Outsourced research and development expenditures

In 2023, the Canadian medical devices manufacturing sector outsourced \$75 million in research and development activities to external organizations. Such expenditures occur when businesses engage outside entities to conduct R&D on their behalf, often due to specialized expertise available externally—either within Canada or internationally—or for cost efficiency reasons. Of these external expenditures, 54.7% (\$41 million) were directed to other entities within Canada, while the remaining funds were allocated to organizations outside the country.

Figure 14
Outsourced R&D expenditures by recipient, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total outsourced R&D expenditure was \$75 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Of the \$41 million in outsourced R&D within Canada, \$33 million was contracted out by Canadian-controlled businesses, with the remainder spent by foreign-controlled firms.

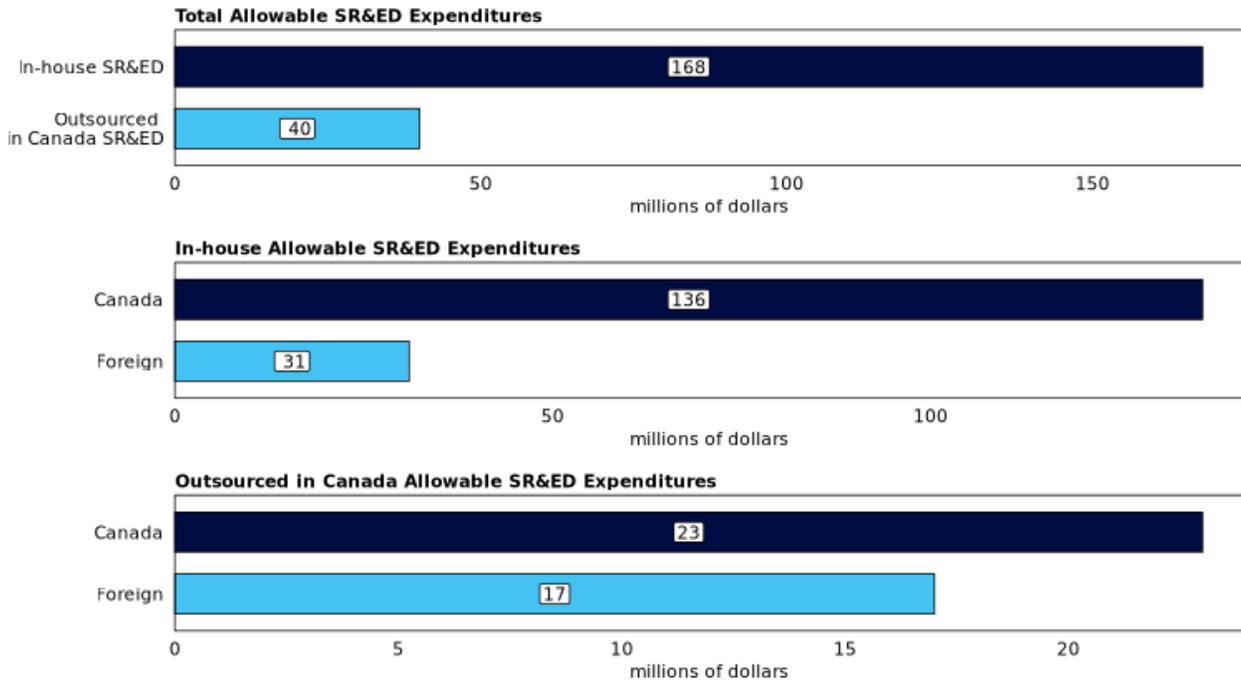
3.9 Research and development expenditures for the Scientific and Experimental Development Program

The Scientific Research and Experimental Development (SR&ED) Program, overseen by the Canada Revenue Agency, is a tax incentive initiative designed to encourage research and development efforts across businesses of all sizes and industries. Eligible organizations can receive either a tax deduction or an investment tax credit, with rates varying from 15.0% to 35.0% depending on organizational size and classification. Certain expenses, such as capital expenditures and research and development activities undertaken outside of Canada, are excluded from program eligibility.

In 2023, businesses in the Canadian medical devices manufacturing sector claimed a total of \$208 million in allowable expenditures, consisting of \$168 million in in-house R&D and \$40 million in outsourced R&D within Canada.

Figure 15
Total allowable SR&ED expenditures, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: The R&D medical devices manufacturing sector's total outsourced R&D expenditure was \$75 million in 2023. Due to rounding, components may not add to the total.
Source: Statistics Canada, custom tabulation, reference year 2023.

Of the allowable in-house claims, 81.0% (\$136 million) were attributed to Canadian-controlled businesses, with the remainder to foreign-controlled firms. For domestic outsourced claims (\$23 million), 57.5% went to Canadian-controlled businesses.

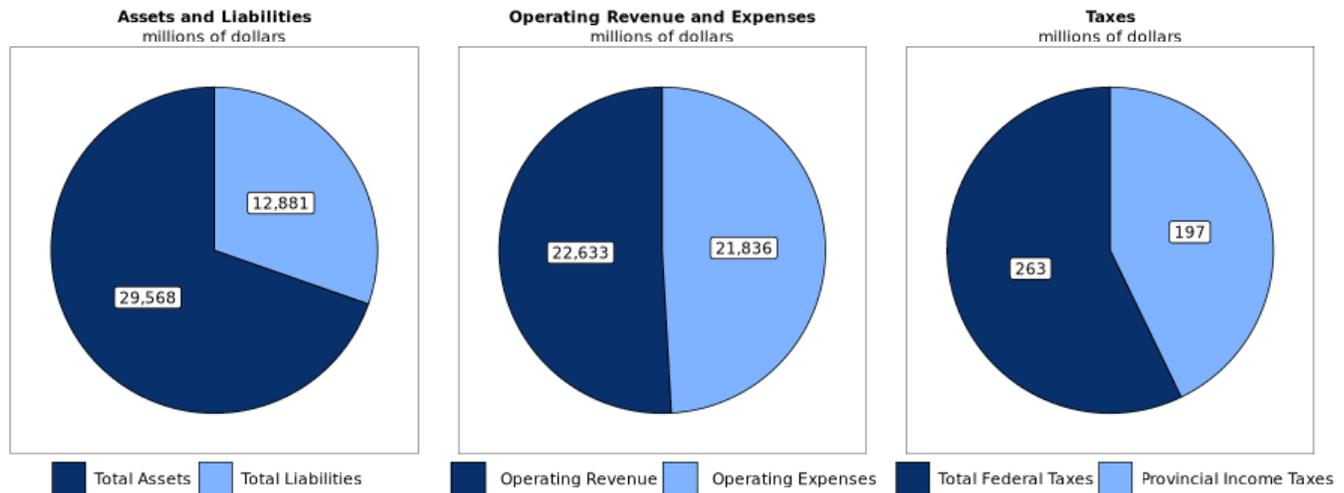
4. Financial indicators

Financial indicators provide an additional means for analysing the sector, complementing data related to GDP, employment, trade, and research and development. Although these indicators do not directly affect GDP, they illustrate the sector's financial condition by showing its size, investment, and fiscal role.

In 2023, the Canadian medical devices manufacturing sector reported operating revenue of \$22.6 billion, expenses of \$21.8 billion, and an operating profit of \$797 million. It held assets totaling \$29.6 billion, liabilities of \$12.9 billion, and paid \$460 million in taxes—split between \$263 million at the federal level and \$197 million provincially.

Figure 16
Financial and taxation, 2023 (millions of dollars)

Canadian medical devices manufacturing sector



Note: Due to rounding, components may not add to the total.

Source: Statistics Canada, custom tabulation, reference year 2023.

5. Limitations

This study evaluates the economic impact of Canada's medical devices manufacturing sector in 2023, though some limitations exist. First, the analysis is based on a single year of data, which restricts the ability to identify trends or assess changes over time. Second, the sector examined in this report does not correspond to an official industry classification; rather, it is a constructed grouping that combines businesses from several NAICS codes to capture activities relevant to the study's objectives. Lastly, the financial indicators include a limited set of indicators and do not capture the full complexity of the sector's financial operations.

Conclusion

This study provides an economic overview of the Canadian medical devices manufacturing sector and its importance in the Canadian economy in 2023.

The results indicate that the sector generates measurable direct, indirect, and induced impacts, engages in research and development activities, supports employment, and contributes to national output and value added.

Appendix

A.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 to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. *See also basic research; experimental development.*

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 is 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.

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.*

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 marketplace. *See also direct impact; indirect impact.*

An **industry** is 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. It should be noted that this value is not the same as revenue generated from the sale of goods and services, as sales can be affected by additional factors such as pricing strategies and marketing efforts.

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 on-site 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. *See also 5.2 Business structures.*

Research and development (R&D) is creative and systematic work undertaken 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 and 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).*

A.2 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 have 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 used data from several different Statistics Canada business surveys and programs, as well as Health Canada licencing databases available through the Open Government Portal. Data for each of the indicators was tied to the correct reporting unit within each of the businesses.

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.

A.3 Methods

The authors undertook a thorough data review to ensure the accuracy of all data used in this study, including information obtained from Health Canada databases. For estimation purposes, most units classified under NAICS 33911 were assigned a weight of 1, as this was their sole activity. For units engaged in activities beyond NAICS 33911—including those in other NAICS categories—revenue-based ratio analysis was applied to isolate the portion attributable to medical device activities.

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.⁸

A.3.1 Economic impacts

The direct economic impacts of the Canadian Medical Devices Manufacturing 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 2023 tax data associated with businesses in 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 Canada 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](#))

8. [RDCI IMDB survey information](#)