

Gross domestic expenditures on research and development, 2020 (final), 2021 (preliminary) and 2022 (intentions)

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Canada's gross domestic expenditures on research and development rose 3.1% from 2019 to \$41.9 billion (\$37.9 billion in 2012 constant prices) in 2020. This marks the fifth consecutive year that research and development (R&D) spending in Canada has increased.

Looking ahead, early estimates show that R&D expenditures in 2021 will increase to \$42.6 billion, which will be led by increased spending by the business enterprise sector. Spending intentions for 2022 indicate a slight increase to \$43.2 billion.

Record federal government research and development funding in 2020

The growth in R&D spending in 2020 was driven primarily by the federal government, which provided an additional \$1.2 billion in funding over the previous year across all R&D sectors to reach \$8.3 billion. This is the largest year-over-year increase in funding for this sector since 1982 and is consistent with the federal government's overall response to the COVID-19 pandemic.

The business enterprise sector was the second-largest contributor to the gain in R&D expenditures in 2020, though it has remained the largest funding source for R&D since 1985. Compared with 2019, funding rose by \$319 million (to \$18.2 billion) across all sectors.

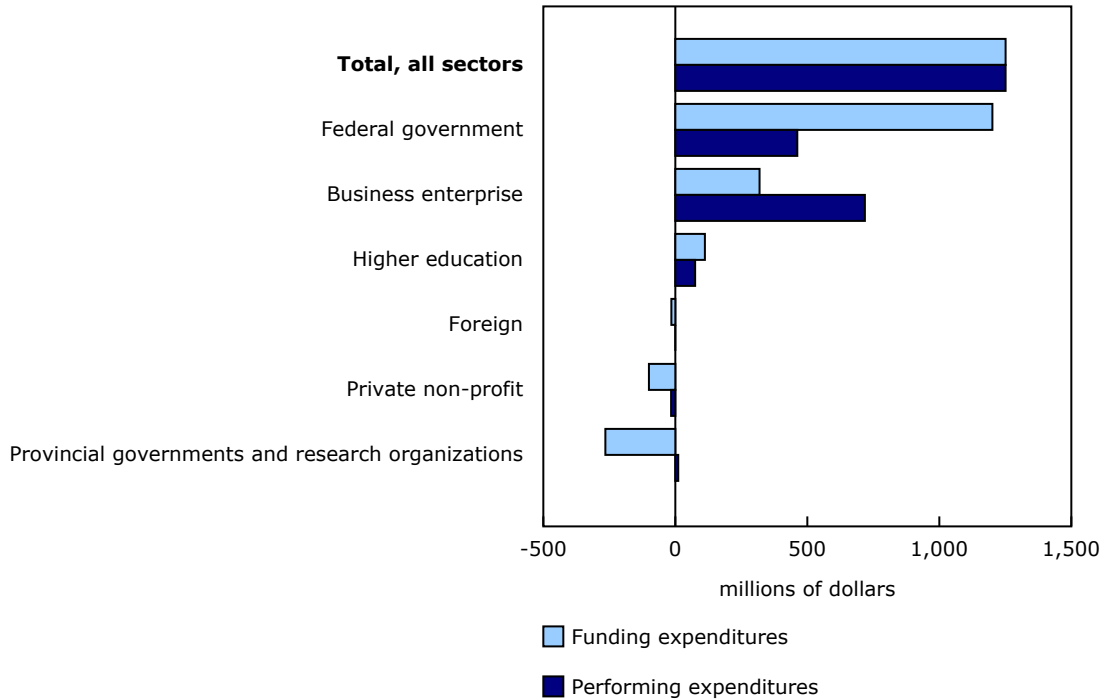
Businesses and higher education institutions are key research and development performers

The business enterprise sector spent \$22.6 billion (+\$718 million) on R&D in 2020, while the higher education sector recorded \$15.9 billion (+\$75 million). Combined, these two sectors accounted for more than 9 in 10 of all R&D activities performed in 2020.

Spending by these and other sectors is tied to the knowledge required to develop and innovate products and services, and is the culmination of funding from various sources, including own-use spending.



Chart 1
Funding and performing expenditures on research and development, year-over-year changes by sector, 2020 (final)



... not applicable

Note(s): Due to rounding, components may not add to totals.

Source(s): Table 27-10-0273-01.

The natural sciences remain the largest field of science in terms of research and development expenditures

R&D expenditures are categorized into two fields of science—natural sciences and engineering, and social sciences, humanities and the arts. Compared with the previous year, spending on natural sciences and engineering increased \$1.1 billion to \$37.5 billion in 2020, mainly as a result of increased funding by the federal government (+\$1.1 billion to \$7.1 billion) and business enterprise sectors (+\$338 million to \$18.1 billion).

Over the same period, spending on social sciences, humanities and the arts rose \$124 million to \$4.3 billion, led by federal government funding (+\$138 million to \$1.1 billion) and higher education funding (+\$76 million to \$2.6 billion).

Table 1
Breakdown of funding changes by sector and by field of research

	2019	2020	2019 to 2020	2019 to 2020
	thousands of current dollars		change in thousands of current dollars	% change
Natural sciences and engineering				
Total, all sectors	36,409	37,536	1,127	3.1
Federal government	6,060	7,122	1,062	17.5
Provincial governments	1,792	1,569	-223	-12.4
Provincial research organizations	6	6	0	0.0
Business enterprise	17,745	18,083	338	1.9
Higher education	5,236	5,272	36	0.7
Private non-profit	1,414	1,343	-71	-5.0
Foreign	4,157	4,142	-15	-0.4
Social sciences, humanities and the arts				
Total, all sectors	4,211	4,335	124	2.9
Federal government	1,000	1,138	138	13.8
Provincial governments	296	254	-42	-14.2
Business enterprise	88	68	-20	-22.7
Higher education	2,529	2,605	76	3.0
Private non-profit	293	264	-29	-9.9
Foreign	5	5	0	0.0

Note(s): Due to rounding, components may not add to totals.

Source(s): Table [27-10-0273-01](#).

Research and development spending driven by Ontario, Quebec and British Columbia

Regionally, the growth in R&D expenditures in 2020 from 2019 was led by Ontario (+\$1.0 billion to \$19.3 billion), followed by Quebec (+\$360.0 million to \$10.5 billion) and British Columbia (+\$230.0 million to \$5.2 billion).

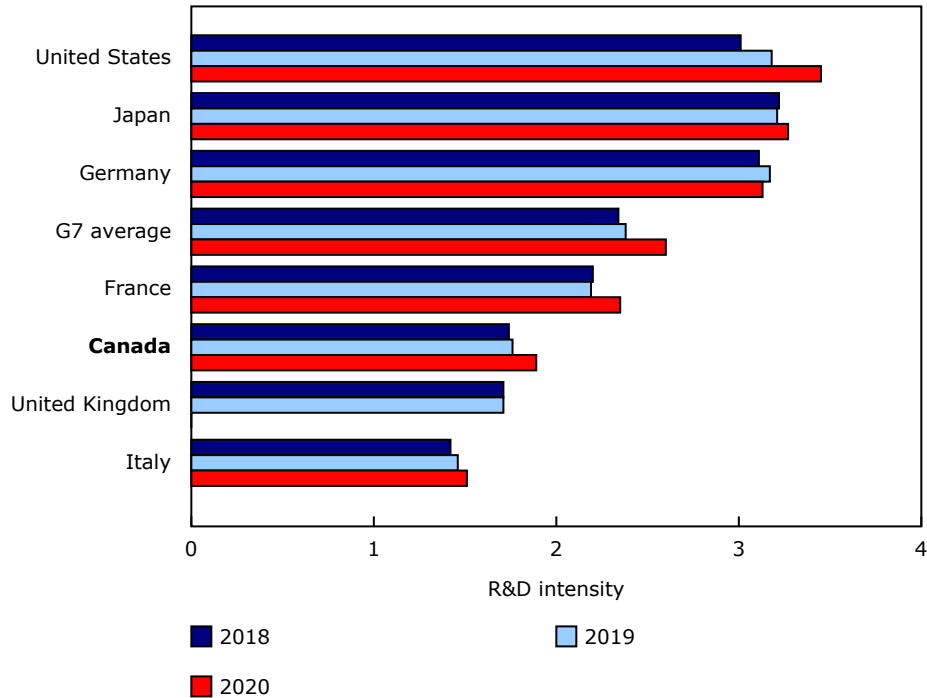
The largest decline in R&D expenditures over the same period was recorded in Alberta (-\$229.0 million to \$3.6 billion).

Canada's research and development intensity on a global scale

On an international scale, Canada's R&D intensity ratio of 1.8 remained below the Organisation for Economic Co-Operation and Development's (OECD) average of 2.7—although Canada's position rose by two spots to 17th in 2020. Similarly, within the Group of Seven (G7) countries, Canada was below the 2.6 average and remained 5th overall out of 6 countries for which data are available.

R&D intensity represents the ratio of a country's R&D expenditures to gross domestic product (GDP). This ratio allows for data comparisons between countries over time, regardless of currency.

Chart 2
Gross domestic expenditures on research and development (R&D) intensity in the G7 countries, 2018 to 2020



.. not available for a specific reference period

Note(s): G7 (Group of Seven) is an intergovernmental forum of the world's largest economies consisting of: Canada; France; Germany; Italy; Japan; the United Kingdom; and the United States. The United Kingdom is not included in the calculation of average gross domestic expenditures on research and development intensity among G7 countries for 2020; its data are not available at the time of this publication.

Source(s): Tables 27-10-0273-01 and 36-10-0222-01, and the Organisation for Economic Co-Operation and Development Science, Technology and Innovation Scoreboard.

Sustainable development goals

On January 1, 2016, the world officially began implementing the [2030 Agenda for Sustainable Development](#)—the United Nations' transformative plan of action that addresses urgent global challenges over the next 15 years. The plan is based on 17 specific sustainable development goals.

Data on Canada's gross domestic expenditures on research and development are an example of how Statistics Canada supports the reporting on the global sustainable development goals. This release will be used to help measure the following goal:



Note to readers

This release presents actual gross domestic expenditures on research and development (GERD) for 2020 (final), actual gross preliminary data for 2021 and intentions data for 2022 at the national level. Provincial-level data are available only for 2020 and earlier years.

Data for GERD are available in current and constant dollars for both performing and funding sectors, by science type, province, territory and region in table 27-10-0273-01. Current dollars are used in this article's analysis.

There are six GERD performing sectors in Canada: business enterprise, private non-profit, higher education, federal government, provincial governments and provincial research organizations. The funding sectors are the same as the performing sectors, but also include the foreign sector.

Research and development (R&D) funding comes from seven sectors: the federal government, provincial governments, business enterprises, higher education, private non-profit organizations, provincial research organizations, and the foreign sector.

GERD data presented in this release are performance based and correspond to the sum of intramural R&D expenditures reported by performing sectors.

Funding sector data are derived from the source of funds indicated by the performing sectors. As a result, GERD-funding sector values will not equal funding data collected and released by individual sectors.

Provincial and territorial expenditures are assigned to the province or territory in which the performing organization is located. Provincial and territorial funding sector expenditures represent R&D funding distributed in a province or territory. The funds do not necessarily originate from within the province.

The business enterprise data source for the GERD program was redesigned in 2014, including concepts and methodology. Users should therefore exercise caution when comparing data with historical datasets. To learn more about these survey changes, see the [Annual Survey of Research and Development in Canadian Industry](#) page on the Statistics Canada website.

The higher education data source was modified to include revised time-use coefficients in 2012. Users should exercise caution when comparing data with historical datasets.

Data for the provincial government performing sector are currently modelled and based on results from the 2011 Provincial Scientific Activities Survey. However, this release includes 2015 data on R&D activities performed by the provincial government of Quebec, which conducted its own survey and provided the information to Statistics Canada. Provincial research organization data are collected through a Statistics Canada survey.

References

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.

[Main Science and Technology Indicators \(MSTI database\)](#). (2023). On this page, search for "GERD as a percentage of GDP". (Accessed on January 25, 2023).

Available tables: table [27-10-0273-01](#).

Definitions, data sources and methods: survey number [5198](#).

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; infostats@statcan.gc.ca) or Media Relations (statcan.mediahotline-ligneinfomedias.statcan@statcan.gc.ca).