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## Key research facts & statistics – Canada

*Last updated 2022-03-11*

**Canadian scientists work for all Canadians.** Their discoveries fuel the innovation economy, their laboratories train highly qualified personnel who contribute to diversifying the Canadian workforce, and their discoveries also provide hope to Canadians who live with diseases for which there are currently no cures, and few treatments. For example, **Neurological disorders, such as Alzheimer’s disease and ALS, are the leading cause of disability and the second leading cause of death worldwide<sup>1</sup>.** The burden of neurological disorders has substantially increased over the last 25 years with ageing of the population and has had a **growing impact on the economy.** Canadian neuroscientists strive to find cures and treatments and need the support of the government to do so.

**Investing in fundamental research will allow Canada to address these important challenges.** Fundamental research to understand how the brain and nervous system work offers our best chance to reduce the burden of neurological disorders and to improve the quality of life of Canadians. COVID-19 has shown us that a health crisis can have wide ranging effects on our health, economy, and mental well-being. In addition, recent research points to COVID-19 having direct impacts on brain structure and function<sup>2</sup>, underscoring the need for investing in scientific research. Increasing research funding is an investment in scientific readiness, to be prepared to face the next health challenge.

### Background information: Research funding in Canada

Robust and predictable increases in funding for fundamental research will support Canada’s scientific community in the long term.

Canadian neuroscience laboratories that perform fundamental research rely mainly on funding provided by the Canadian Government through the tri councils: the **Canadian Institutes of Health Research - CIHR**, the **Natural Science and Engineering Research Council - NSERC**, and the **Social Sciences and Humanities Research Council -SSHRC**. Project grants awarded by the CIHR are the core funding mechanism for biomedical research in Canada. Unfortunately, **success rates in recent competition have declined rapidly** (Figure below). The success rates for funding applications at CIHR has fallen since 2005, from a 33% success rate to a value just above 15% in 2020, or less than one in six successful applications, leading to financial insecurity for laboratories. Current success rates are too low to maintain a diverse and flourishing research environment, as many excellent research programs go unfunded. Researchers spend countless hours writing grant applications, while their chance of being successful are too low to be sustainable. In addition, it should be noted that the current 15% funding level is only achieved by making drastic cuts to the requested budgets of all

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<sup>1</sup> Feigin et al. Lancet Neurol. 2019;18(5):459-480. doi:10.1016/S1474-4422(18)30499-X

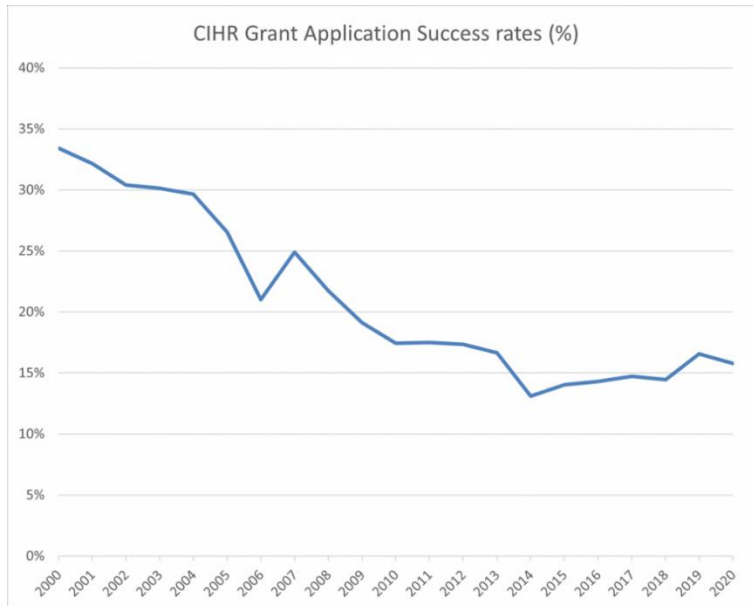
<sup>2</sup> <https://www.nature.com/articles/s41586-022-04569-5>



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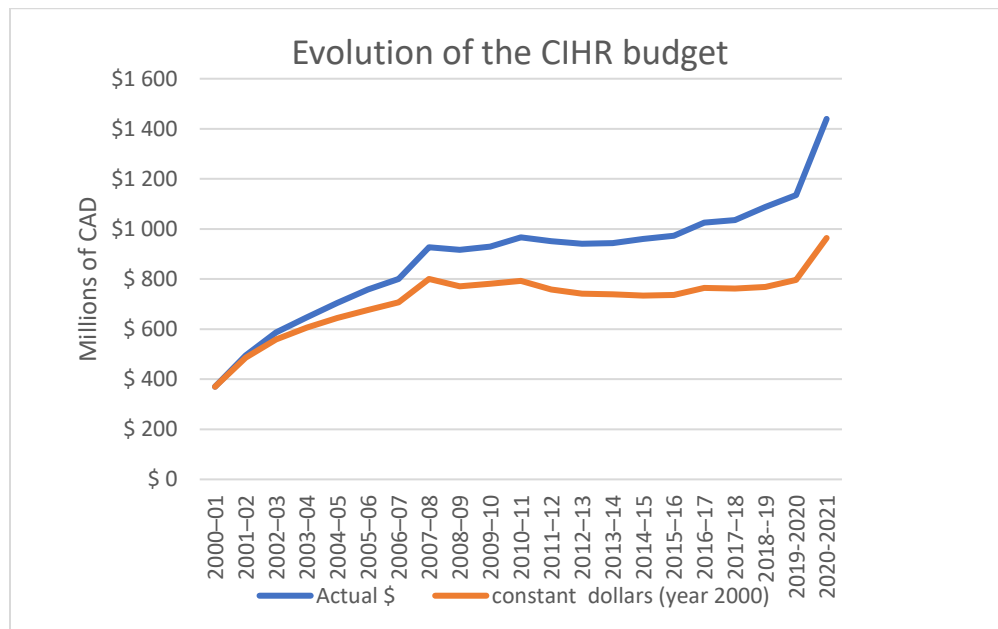
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project grants (often close to 25%), which further highlights the lack of sufficient funding for this competition.



While detailed financial analysis could explain this decline in success rates, one clear contributing factor is the fact that the **CIHR budget has not significantly increased in more than a decade**. The budget for CIHR in 2007-2008 was \$927M and in 2019-2020 it was \$1135M. While this represents an increase in actual dollars, when inflation is considered (using the bank of Canada inflation calculator), it represents only a 2.5% increase in constant, 2006 dollars. The number of researchers has

increased (3850 applications in 2006 vs. 4629 in 2019), and the cost of experimental materials increases at a higher rate than inflation. We do note an increase for the 2020-2021 fiscal year. A large part of this increase is due to a \$203.6 M CAD time-limited funding for COVID-19 research.



While specific investments in COVID-19 research must be applauded, **it is important to note that most health research is focused on non-COVID-19 diseases**. COVID-19 has had an important



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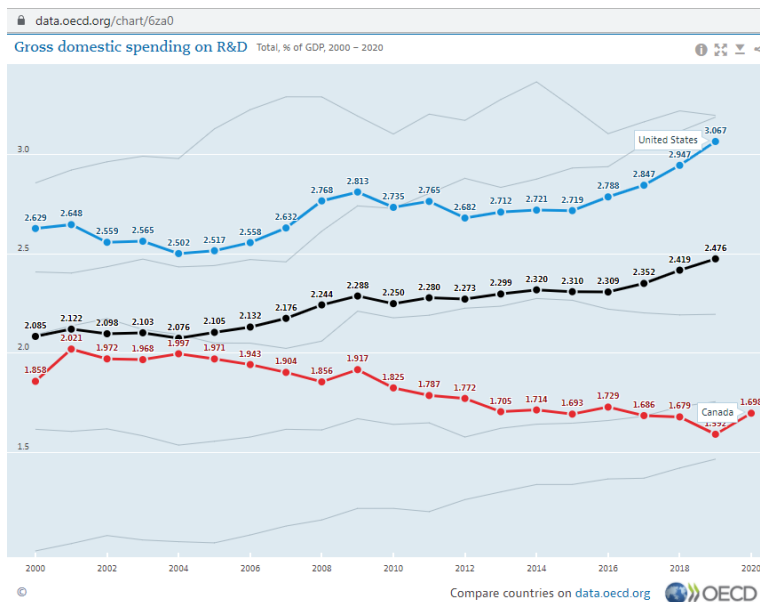
impact on research laboratories in Canada<sup>3</sup>. Due to the pandemic, most research laboratories were shut down for a minimum of three months and are still not operating at full capacity over two years later, causing a tremendous setback to Canada's research ecosystem. As labs were closed, they could not hire and train students, post-docs and staff to perform experiments, leading to a loss of highly qualified personnel and of research materials developed during long-term experiments (multi-month and even multi-year projects). Researchers and trainees have also lost funding opportunities. Finally, there has been a significant consumable cost increase since the pandemic – researchers are now paying upwards of 20% more for supplies than they were pre-pandemic.

Most research projects are long-term endeavours. Loss of funding for a single year, because of the hypercompetitive funding situation, means having to let go specialists that cannot easily be replaced – very significant setbacks in research. Some laboratories do not recover, and end up closing, or moving to more supportive environments, in other countries.

## Research and Development investments in Canada – Comparison with other countries

Despite the re-investments in the Canadian funding agencies announced in 2018, research funding in Canada remains low when compared to that of other countries.

According to the latest data from the OECD (Organisation for Economic Co-operation and Development <http://www.oecd.org/>) Canada is the only country in the G7 whose investment in Research and Development have steadily declined in the last 15 years, while showing only a small increase in 2020.



OECD Data on Gross Domestic spending on Research and Development - Canada compared to other countries of the G7. Dark black line is OECD average (2021),. doi: 10.1787/d8b068b4-en (Accessed on 20 December 2021)

This data shows **Canada ranks second to last of the G7 countries in terms of Gross Domestic spending on Research & Development**, with only 1.7% of its GDP invested in R&D. This low

<sup>3</sup> <https://can-acn.org/covid-impact-survey/>



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investment level also places Canada below the average of OECD countries, at 2.5%, and well below the US, with 3.1% of its GDP in R&D.

We recognize that government investment in R&D is only a small proportion of the total R&D investment in a country, however, research shows that government investment is multiplied by private investments, leading to a high return on investment.

Many countries have recognized this, including Japan, Germany and the USA. In May 2021, President Biden's first big budget request proposed increases for science budgets, including a 21% increase to the National Institutes of Health (NIH)<sup>4</sup>. NIH's 2020 budget was \$USD 41.5 billion dollars, compared to CIHR's \$CAD 1.1 billion, a 46-fold difference in funding, which contrast with only nine-fold difference in population. Adjustments for GDP per capita or purchasing power have only a minor influence on such large discrepancies. The latest NIH budget announcement will further increase this gap.

## Going forward

The COVID-19 pandemic has highlighted the importance of **scientific research in Canada** in times of crisis. We need now, more than ever, to build on the scientific discoveries of Canadian scientists to ensure we recover from COVID-19 in the immediate future.

CAN recommends a one-time **25% budget increase to CIHR, NSERC and SSHRC** in the next budget to bring Canadian research back to pre-COVID levels, and predictable long-term research funding increases (**10% per year**) to meet new and existing challenges. Read our full recommendations to the Finance committee here: <https://can-acn.org/docs/CAN-FINA-consultations-pre-budget-2022.pdf>

Building Canada's in-country expertise and capacity will also reduce our dependence on other countries.

Significant investments in science need to be made this year and in coming years. Canada's Fundamental Science Review, published in 2017 by the government of Canada<sup>5</sup>, offered a clear path to reinvest in scientific research through the three main granting councils. Our recommendations are in line with the recommendations of the Science review and are supported by the Canadian scientists we surveyed.

Our scientists are ready and motivated to work for Canada, and to contribute to Canada's recovery and economic restart. Investing in research today will ensure we can meet new and existing challenges and remain competitive in a changing economy.

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<sup>4</sup> <https://www.sciencemag.org/news/2021/05/biden-seeks-big-increases-science-budgets>

<sup>5</sup> [sciencereview.ca](http://sciencereview.ca)