Making the case for brain research: Bibliometrics applied through a research funder lens

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Who are we?

Fondation Brain Canada Foundation

Lead, Evaluation & Special Projects
Brain Canada

Mitacs Accelerate fellow
Post-doctoral researcher
Bibliometrics specialist

Data Specialist, Evaluation & Special Projects
Brain Canada

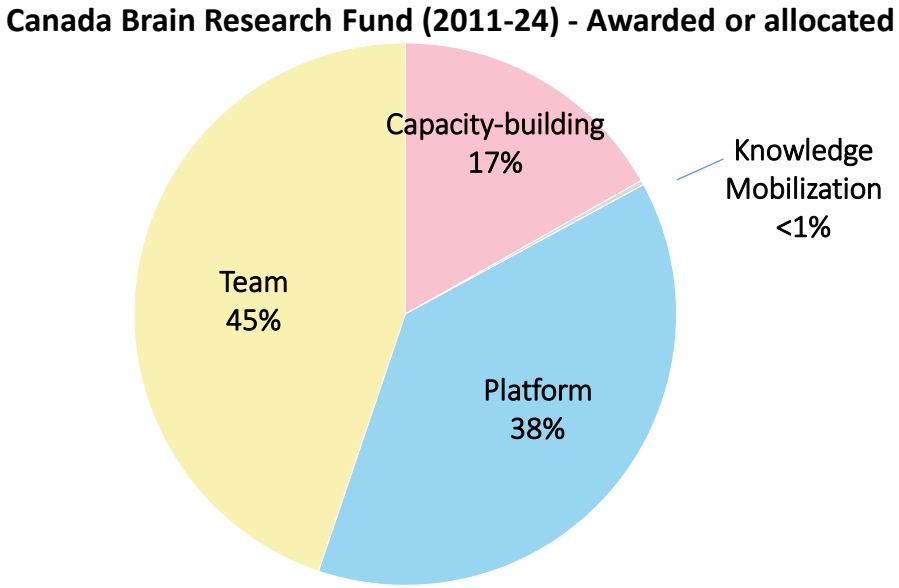
What is Brain Canada?

Fondation Brain Canada Foundation

Our vision: Bold science for brain health

Our mission: Accelerating, amplifying and funding brain research across Canada

Through a 1:1 matched funding model with the Government of Canada (via Health Canada):
From 2011-2024 Brain Canada established an envelope of **$400 million** for brain research in Canada.
From 2024-2028, Brain Canada is establishing a total envelope of **$160 million** for brain research.



From 2011-2024:

- >100 partners
- 135 funding opportunities
- 562 grants awarded
- 1,155+ researchers funded

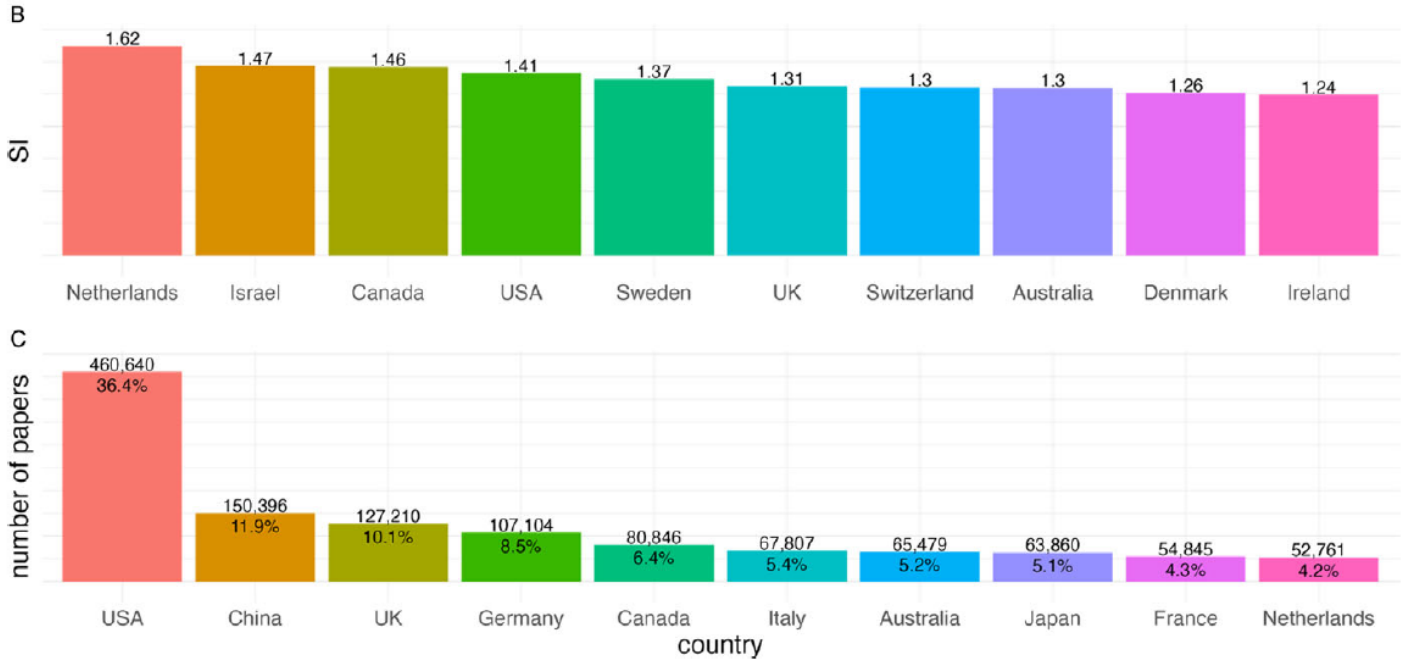
How do we define impact?

- We seek to measure **RESEARCH IMPACT**: the provable benefits of our funded research to society, the changes made possible by Brain Canada's funding.
    - Adapted CAHS framework our guide re: research impact (e.g., advances in knowledge; influence on development of solutions, decision-making; economic and social benefits; health outcomes)
- We seek to measure **OUR IMPACT ON THE RESEARCH ECOSYSTEM**: the effects of Brain Canada's programs and activities in enabling research, enhancing capacity, amplifying investment.

Impact case studies and data help us to **assess and convey our value** to stakeholders (e.g., government, donors, partners).

Canada's position: Research on brain research

- Over the past 30 years, the number of brain-related papers has grown exponentially and at a faster pace than science in general.
- **Canada is the 3rd country most specialized in brain research**, ranking ahead of the US.
- **Canada is among the top five countries publishing the most in brain research**; a total 6.4% of brain research articles in the world are published by Canadian researchers.



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Canada's position: Research on brain research

Fondation Brain Canada Foundation

- **Canada has an above average scholarly impact in brain research**; this is especially the case in clinical medicine.

Country	Biomedical Research	Clinical Medicine	Computer Science	Health	Psychology	All Disciplines
USA	1.35	1.28	1.27	1.08	1.14	1.26
China	0.88	0.91	1.17	1.13	0.86	0.93
UK	1.34	1.47	1.23	1.17	1.18	1.38
Germany	1.17	1.22	1.02	1.05	1.02	1.18
Canada	1.20	1.30	1.12	1.06	1.07	1.23
Italy	1.10	1.16	1.07	1.24	1.02	1.14
Australia	1.16	1.27	1.24	1.08	1.09	1.20
Japan	0.86	0.80	0.80	0.76	0.58	0.80
France	1.13	1.19	0.93	1.15	0.91	1.15
Netherlands	1.34	1.44	1.17	1.18	1.23	1.38
Spain	1.11	1.13	0.92	1.07	0.82	1.08

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BCF research impact: What we've measured

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Bibliometric database: Open Alex

Scope: publication list from funded researchers' progress reports

- Number of peer-reviewed publications: **>1,670**
  - **80%** of papers reported in 2024-25 are published via open access
- Proportion of papers including international authors: **54.5%**
- Number of Citations of Brain Canada-Funded Publications (via Open Alex) = **196,917**
  - Note this was 66,602 in 2024 when analysis was conducted via Web of Science
- Average year and field normalized citations*: **4.3**
- Degree of International Citations: Brain Canada-funded publications receive on average **95.6%** of their citations from international documents (where at least one author is not Canadian)

BCF research impact: What we've measured

Bibliometric database: Web of Science

Scope: publication list from funded researchers' progress reports

- Overall, there are **7% of Brain Canada-funded papers among the top 1% most cited** papers in their fields.
- Looking at **neurology and neurosurgery specifically**:
  - There are **3.5% of Brain Canada-funded papers among the top 1% most cited**.
  - Compared to the top 20 biggest brain science funders, **Brain Canada is second** in proportion of papers in the top 1% for this category.
  - Assessed as a percentile, **Brain Canada ranks closer to 14th**, at 60%.

BCF research impact: What we've measured

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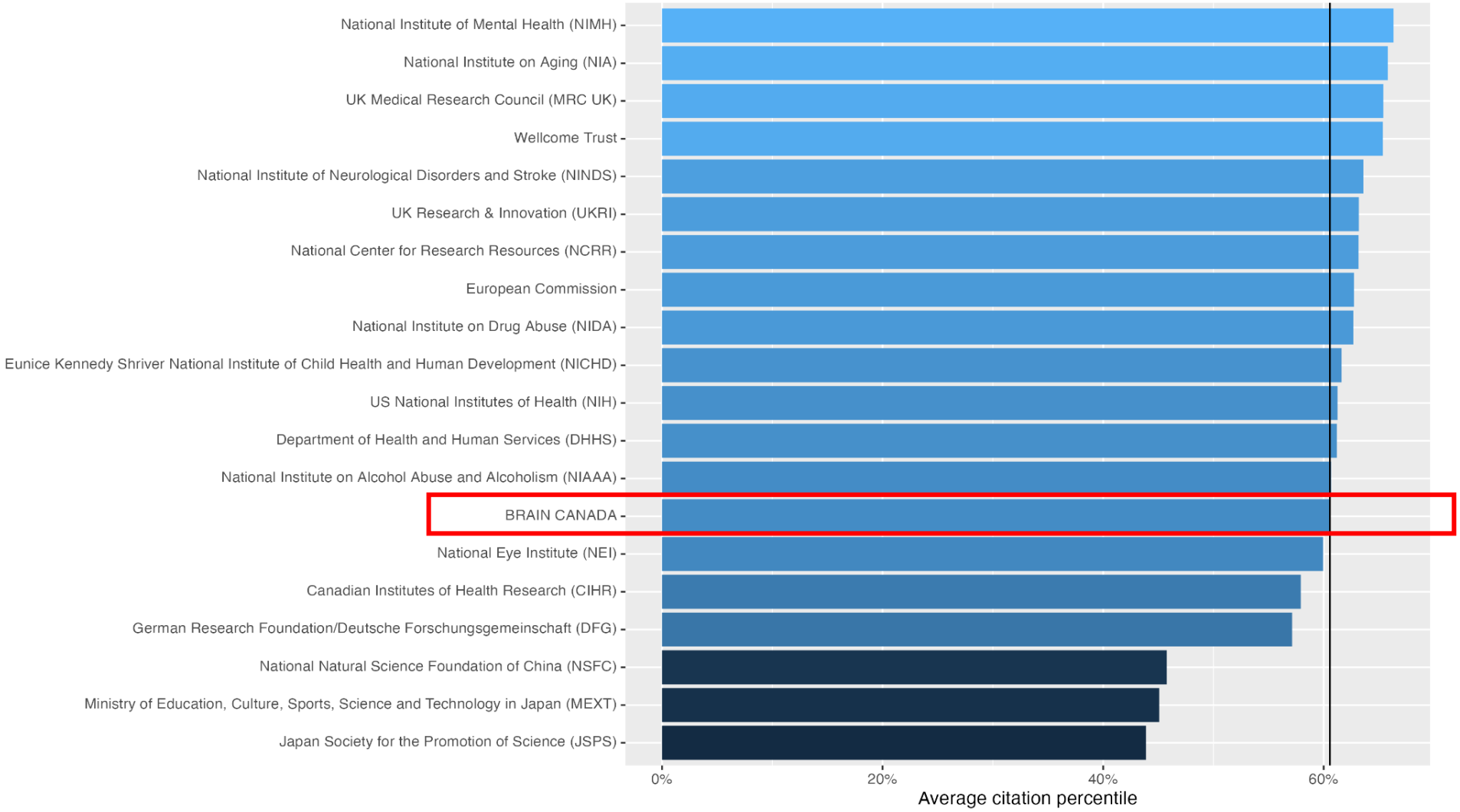

BCF research impact: What we've measured

Limitations:

- Not all documents are covered by Web of Science, and many publications published in other languages or smaller journals are not considered.
- Retrieval is inconsistent – Brain Canada publications are retrieved from progress reports rather than funding acknowledgments vs comparison funders where retrieval is via funding acknowledgement.
- The top 1% most cited metric conveys only a partial picture of impact generated by different agencies and can be detrimental for diversity in science, focusing only on highly impactful contributions.

BCF ecosystem impact: What we're exploring

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Bibliometric database: Open Alex

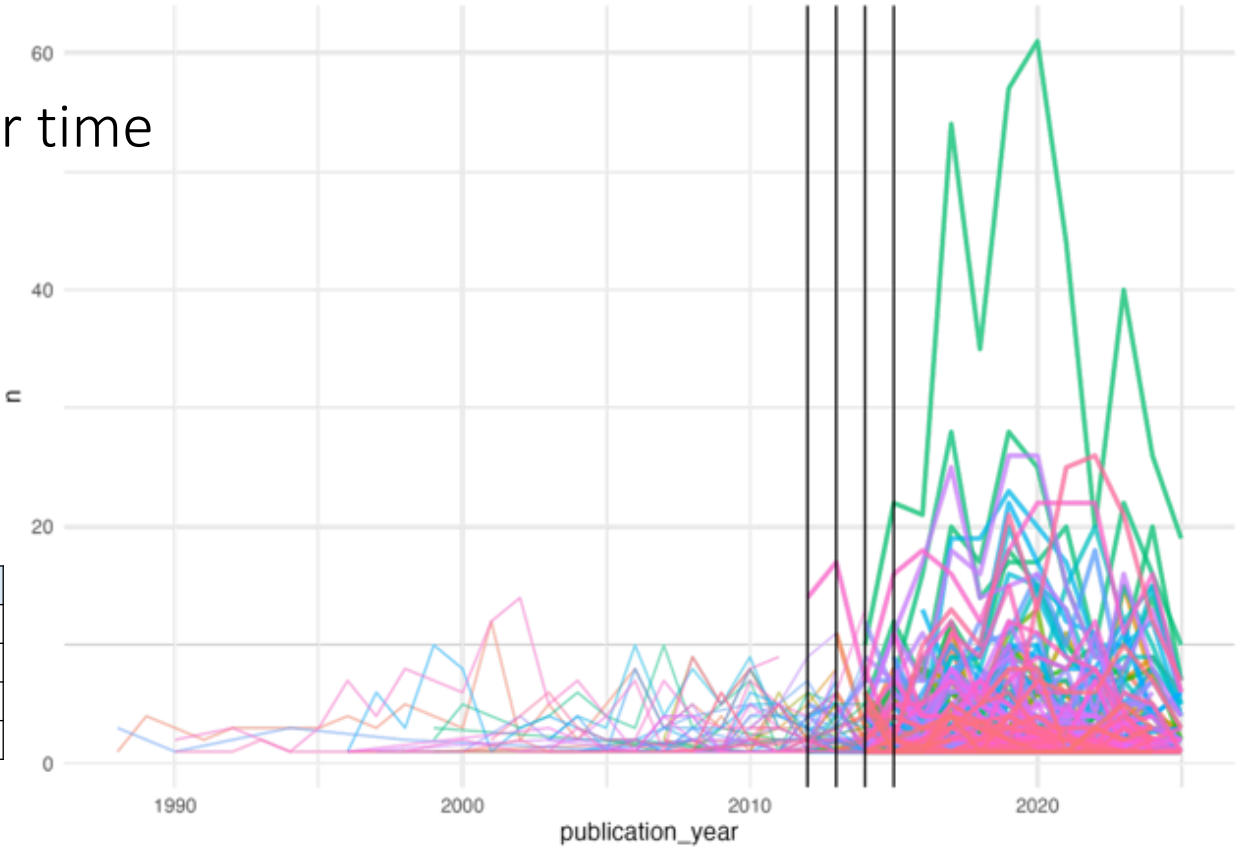
Scope: funded researcher pairs and ORCIDs, publications (as per funding ackn)

Assessing the effect of **Team Grants** on partnerships between researcher pairs over time

- Looking at publications by pairs before and after the grants, it's clear the team grants had an impact on research outputs
- There are **twice as many publications** after the grants compared to before

time_group	average_pub
after	3.68
during	3.43
before	2.49

collab_group	n	percent
new_collaborators	274	62.40%
previous_collaborators	149	33.90%
ceased_collaborators	12	2.70%
only collaborated in the grant year	4	0.90%



Learnings from the funding agency perspective

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- Lots of great tools/services for additional analyses (e.g., policy impact) – but even non-profit priced **subscriptions are out of reach**, our funding needs to go to research
  - As a funder, we promote open science, want to conduct bibliometrics via open science
- **Transition to open science database – Web of Science to Open Alex:** Now have access to the data, and coverage is better, but there's challenges!
  - **Clean data is a barrier:** Open Alex data is messy, lots of time spent cleaning publications and validating author name lists in order to do analyses via Open Alex
- **Publication retrieval source:** funding acknowledgements or progress reports?
  - Many researchers don't acknowledge BCF funding (funding ackn coverage not complete)
  - Many post-grant papers don't get tracked (response rate for post-grant reporting not as high)
- **Program-level analyses** are difficult, small sample size limits interpretation

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