

University of Windsor &

Brain Tumour Foundation of Canada

2021 BTFC Internship Recap



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What is a Brain tumour?

Definition: An abnormal growth of cells within the brain that may result from noncancerous (benign) or cancerous (malignant) origin.

Symptoms may include:

- Onset of frequent headaches
- Nausea or vomiting
- Behavior changes
- Hearing, vision or sensation changes
- Seizures
- Difficulties with speech or maintaining balance.
- Others dependent on area.



Significance



- ❑ 10th leading cause of death globally.
- ❑ Predict 25,000 new brain tumour cases will be diagnosed in North America in 2021.
- ❑ Individuals diagnosed face a 5-year survival of nearly 31% depending on age.

Illustrates importance of understanding the mechanisms underlying brain tumours in order to prevent and treat cases globally.

Research

A microscopic view of brain tissue. The background is dark blue. There are several large, irregular, red, textured masses representing brain tumors. Interspersed among these are numerous smaller, smooth, blue, spherical structures representing normal brain cells or neurons. The overall scene is illuminated with a cool blue light, giving it a scientific and somewhat somber appearance.

The only way to improve our understanding is through research and expansion of acceptable scientific methods to assist in finding a cure and cause of brain tumours.

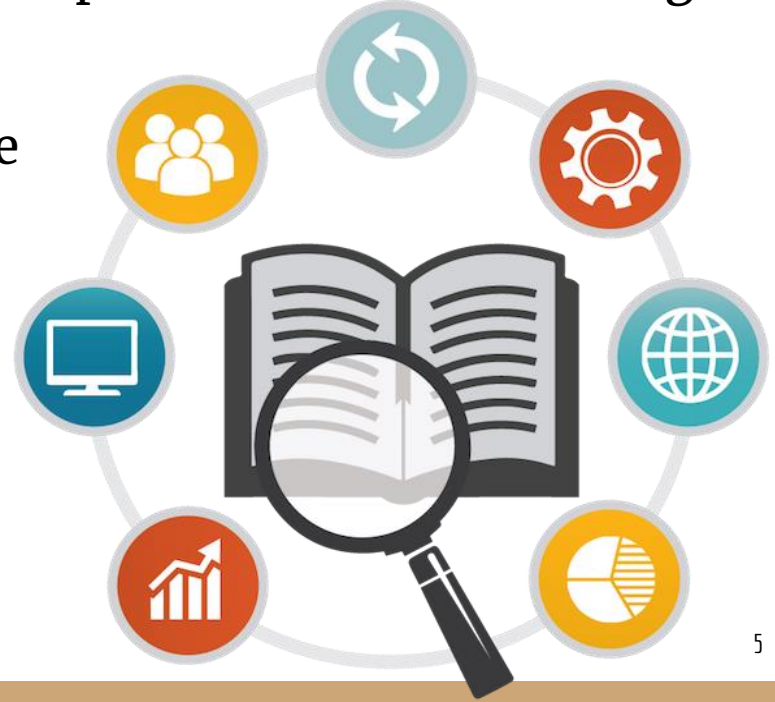
What's holding us back?

Gaps in research funding!

Our Goal

The goal of our project is to understanding the funding landscape for brain tumour research across Canada, with hopes to promote research funding in future years.

Furthermore, we hope to develop a template for investigating funding patterns across Canada that will aid future students in this investigation.



Methods

- Data from 2015-2020 of where brain tumour research funding has come from, which labs have received funding, and the amount of funding received was collected
- The impact of the COVID-19 pandemic on these labs, as well as its impact on funding was also documented.
- Data was collected by email and by telephone.
- Funding details were also obtained from publicly available websites and annual reports



Methods

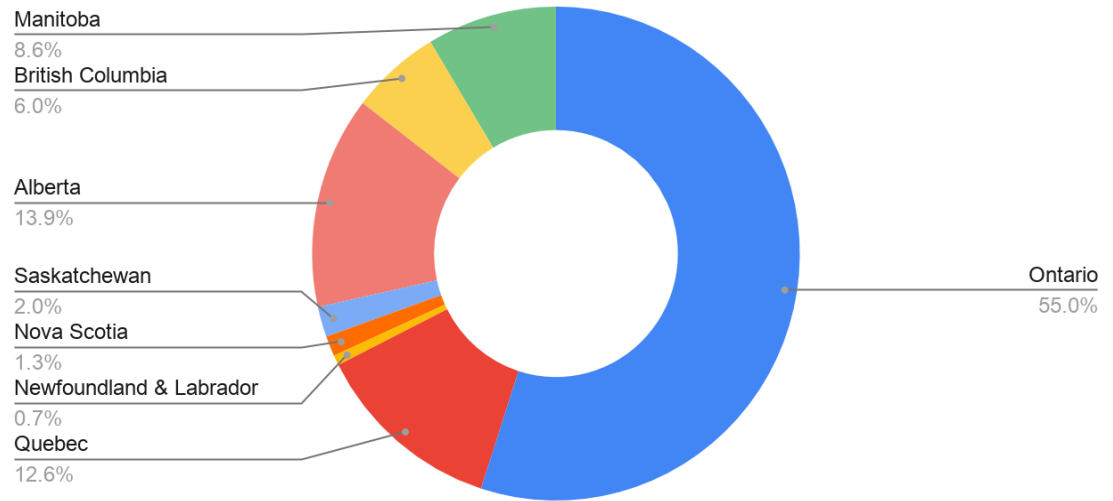
- Collected information was organized based on province and by principal investigator of the project.
- Estimates of total brain tumour funding were made through summation of annual funding amounts from each lab.



Results

- **151** investigators that participate in brain tumour research in Canada
 - Ontario: **83**
 - Alberta: **21**
 - Quebec: **19**
 - Manitoba: **13**
 - British Columbia: **9**
 - Saskatchewan: **3**
 - Nova Scotia: **2**
 - Newfoundland and Labrador: **1**

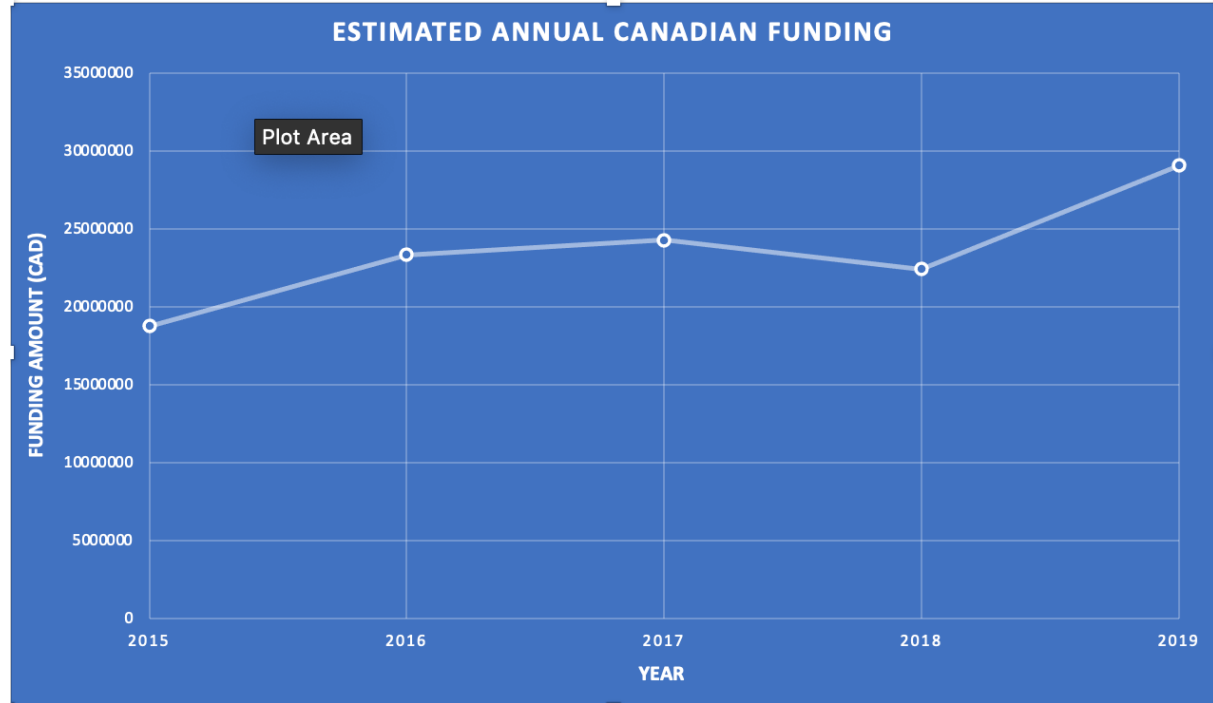
Estimated Proportion of Brain Tumour Research Investigators in Canada by Province



- No investigators found in the NWT, Yukon, Nunavut, PEI, and New Brunswick

Results

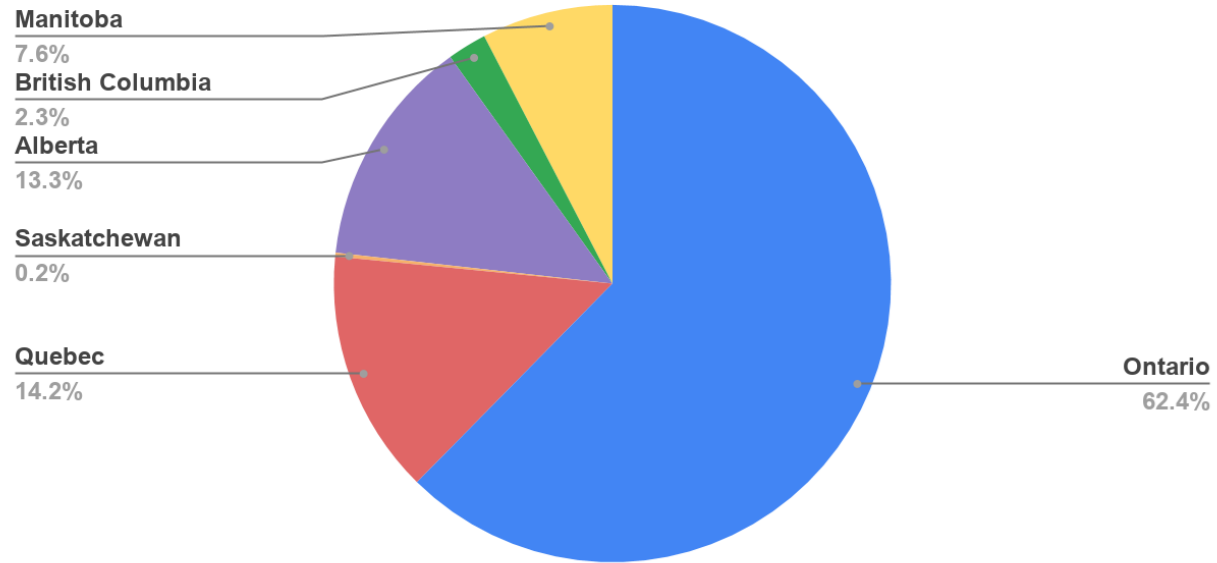
- Overall, there was an increase in funding of successive years.
- The slight decrease in funding in 2018 may be attributed to any number of factors or errors with data collection.
- Data does not represent the exhaustive amount of annual funding in Canada.
- Estimates are based on annual values received to principal investigators of each lab and do not account for allocation of funding to alternate services outside of brain tumour research.



Results

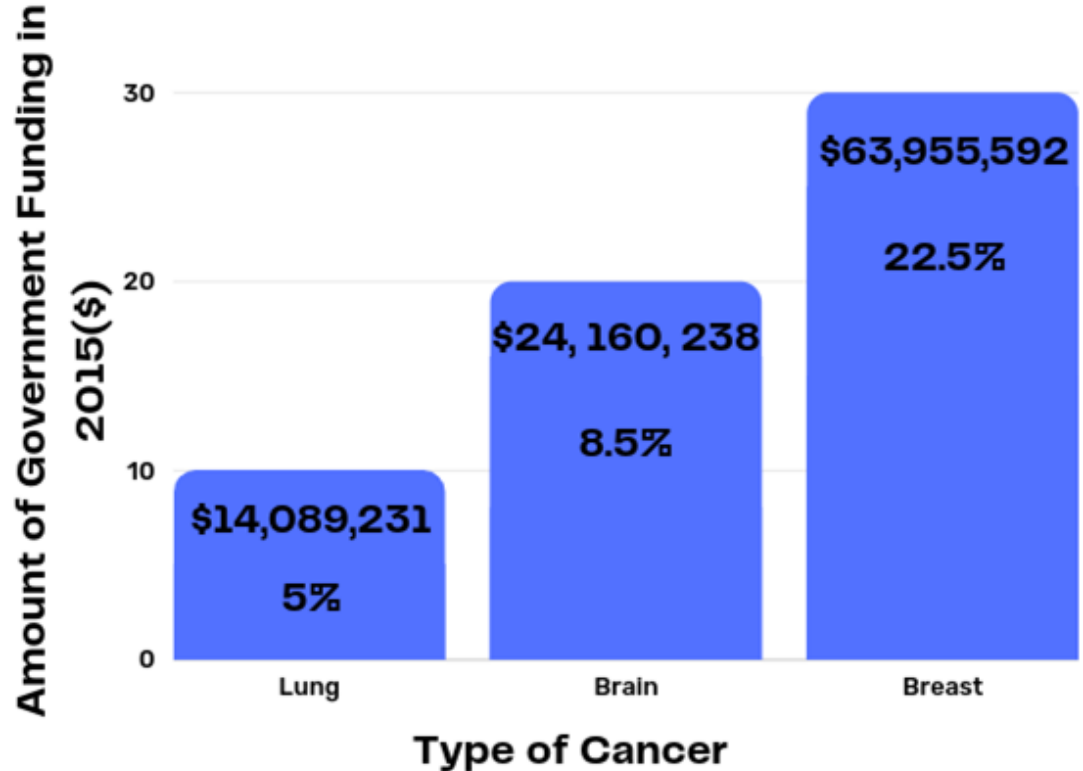
- Total brain tumour research funding in Canada (2015-2019): **\$157,000,000**
 - Ontario: **\$97.9M**
 - Quebec: **\$22.3M**
 - Alberta: **\$20.9M**
- No funding data found for the investigators in Nova Scotia and Newfoundland & Labrador

Estimated Brain Tumour Funding Proportions by Canadian Province from 2015-2019



Results

- Coronado et al. (2018) comparison of Canadian government funding cancer research allocation based on cancer type in 2015.
 - Breast: 22.5% (\$63,955,592)
 - Brain: 8.5% (\$24,160,238)
 - Lung: 5% (\$14,089,231)
- Evidence supports the obvious neglect in brain cancer research funding previously mentioned



Discussion: Summary

- Throughout this investigation, we have developed a better understanding of the funding concerning brain tumour research in Canada
- **Ontario** contains the most amount of labs in Canada (approximately 50%) and has received about two-thirds of the total funding over the past five years. There has also been a substantial amount of funding in the provinces of **Quebec** and **Alberta**.
- Although funding is still sparse, over the past 5 years we have observed an increase in the total annual funding for brain tumour research in Canada.



Discussion: Data Collection Challenges

- Hesitation from labs to provide funding information that should be available to the public
 - Many labs refused to provide much assistance either because they were uncomfortable with providing this information or because they were not available to do so
- Due to COVID-19 it was difficult to stay in touch with labs because many of them have limited in-lab hours
 - This made tracking down the right person to provide this information time consuming
- Phone calls were not very successful in terms of getting a hold of these laboratories and emails were not always answered in a timely manner.
- Uncertainty in the collected data due to the possibility of overlap
 - A lot of the information we obtained was based on group projects or projects with more than one funder identified.
 - Some laboratories listed the funding sources for each year but others did not.



Discussion: Gap in Funding



- Breast cancer has a larger global impact through greater mortality at younger ages but this does not eradicate the need for more brain cancer research funding.
- Brain cancer research has only recently been on the rise, yet **breast cancer research has had significantly higher funding** for many years.
 - Since 2000, the CBCF has invested over \$360M in breast cancer research yet brain cancer grants and funding have been extremely sparse
 - According to Ovarian Cancer Canada from 2005-2015, when comparing ovarian cancer funding to breast, breast cancer research received \$249.3M whereas ovarian cancer received not even half of that at \$38.6M

Future Goals

- Brainstorming ideas to attract the attention of laboratories and make them feel more comfortable with providing this information
 - BTFC can send out a survey on behalf of the team working on the project so the laboratories are reassured that this is official and purposeful
- Alternate methods to data collection to increase the amount of responses received from labs
 - Use BTFC social media platforms to provide information about the project, its purpose, and its value to brain tumour research.
 - Social media may cause smaller, less known labs that may have not been previously discovered during this project to reach out and provide their information



COVID-19 Impact

- Global Cancer Coalitions Network (GCCN) conducted a survey in which **104** organizations from **46** countries (including Canada) participated
 - Two-thirds of the organisations that fundraised experienced a fall in income in 2020, with an average drop of **48%**
 - About **50%** had no access to national funding schemes to help them continue operating
 - **Two-thirds** of all the organizations that fund or partake in research have had their projects slowed or halted because of the pandemic
- Overall decrease in total income for the funding of cancer research
- A survey from 2020 performed on practitioners, scientists, and trainees from 21 neuro oncology organizations found that **63%** of researchers temporarily closed their laboratories because of the pandemic.
- Due to these current trends, it is very predictable that **the COVID-19 pandemic has decreased the income of labs** and has ultimately slowed the advancement of brain tumour research in Canada.



Out Take Homes

- We have learned a great deal about the cancer research industry, especially how much work goes into obtaining grants and how difficult it is for labs to receive grants with such limited funding in the field.
- Integrating education and real life situations created a very unique educational experience.
- This project emphasized the importance of increasing government based brain cancer research funding by examining the clear lack of funding while comparing that to breast cancer research.
- The time we spent on this project has been eye opening and we are looking forward to seeing the growth and impact that this project will have on brain tumour research in Canada in future years to come!



Thank You

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- Dr. Dorota Lubanska
- Dr. Simon Du Toit

And any laboratories or investigators that contributed.



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STAY SAFE!