



Statistics  
Canada



THE UNIVERSITY  
OF BRITISH COLUMBIA  
Okanagan Campus

# Statistics Canada **COVID-19** Canadian Employment Wage Subsidy

An Analysis

Bohan Gao, Eric Baxter & Vicens Paneque

# **COVID-19 Canadian Employment Wage Subsidy Analysis & Feasibility Study of API use for the Prediction of Economic Activity and Recovery**

**Week Report  
May 3 - May 9, 2021**

**Bohan Gao, Eric Baxter & Vicens Paneque**

# **1. Contributors**

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- 5. Roadblocks and Difficulties**
- 6. Planning and Action Items**
- 7. Specific Assignments**
- 8. Operational Problems**
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# Contributors

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**Data Scientist**

- MDS | UBCO (2021)
- B.Sc. Computer Science | UBCO (2020)

**Eric Baxter**  
**Data Scientist**

- MDS | UBCO (2021)
- B.Sc. Mathematics | University of Ottawa (2020)
- B.Sc. Psychology | University of Ottawa (2018)

**Vicens Paneque**  
**Data Scientist**

- MDS | UBCO (2021)
- MBA | EGADE Business School (2017)
- B.A. Financial Management | Tec de Monterrey (2010)

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# Client

## Statistics Canada

- Statistics Canada (StatCan), is Canada's national statistics office.
- It produces relevant, accurate and timely statistics that help Canadians better understand their country, to function effectively as citizens and decision makers.

Statistics  
Canada



Statistique  
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# Executive Summary

## Project Proposal

- This proposed project is in collaboration with StatCan and the University of British Columbia (UBC) Master of Data Science Program and is to be conducted in two sections.
  - The **visualization of the Canada Emergency Wage Subsidy (CEWS)** will involve the development and deployment of an interactive visualization dashboard for the StatCan website, and a formal report detailing the effectiveness of the program in different sectors and geographic zones.
  - A **feasibility study** with the intent of examining potential of available application programming interfaces (**APIs**), **as real-time predictors of economic recovery and activity, and for incorporating quality of life measurements into decision-making**.

# **Statement of Work**

## **CEWS Visualization Dashboard**

- The primary purpose of this dashboard will be to **elucidate the extent and impact of the CEWS program**, and **make the information available and understandable** to general Canadian audiences.
- The interactive dashboard will **allow users to study any available dimension of the data** on their own, while the analytic report will allow us to **share the insights** we ourselves gain from the use of the dashboard.

# **Statement of Work**

## **CEWS Report**

- Using insights gained from the CEWS dashboard, this report will act as a **detailed breakdown of the effectiveness of the CEWS program.**
- The program will be studied **by industry, province, city, and overall Canadian trends.**

# **Statement of Work**

## **API Feasibility Study**

- The main deliverable will be a report **outlining the capabilities of a number of promising APIs, along with the expected costs associated with using them to track economic activity and recovery.**
- The focus will be on researching the capabilities of a number of different APIs for these goals, and not on the development of the tools themselves.

# Research questions

## CEWS Visualization Dashboard

- **Analyze CEWS data and identify trends** across a number of dimensions.
- **Study the effects of geographical location, industry and week-periods of claims** on the extent of effectiveness of the CEWS program.
- Determine **CEWS outcomes in avoiding layoffs, rehiring employees, and creating new jobs.**

# Research questions

## API Feasibility Study

- **Research the feasibility of using various APIs** to study economic activity and recovery in real-time, with more granularity than traditional metrics allow.
- **Detail the potential effectiveness** of various promising APIs, along **with the potential costs associated** with their use.
- **Pave the way for the development of tools** which allow more efficient and granular measures of economic activity, recovery, and growth.

# Data Sources

## CEWS Regional and Community-level Database

- The CEWS Regional and Community-level Database (the database) is a custom dataset constructed with CEWS micro data and other administrative data sources available at StatsCan.
- The database contains information on every subsidy given out through the first 8 4-weeks claim period of the CEWS program.

Start_date_of_CEWS_period	RegionCode	RegionName	RuralUrbanFlag	CMACAFlag	IndustryCode	IndustryName	Number_business_locations	Subsidy_amount	Supported_employees	CEWS_rehire_count
511860	2020-09-27	1315015	Beresford	URBAN	Not applicable	624	Social assistance	0	X	X
548431	2020-09-27	4806001	Foothills No. 31	RURAL	Not applicable	56	Administrative and support, waste management a...	10	51,000	74
21313	2020-03-15	2457025	McMasterville	URBAN	Not applicable	333	Machinery manufacturing	0	X	X
298901	2020-07-05	1006009	Gander	URBAN	Not applicable	711	Performing arts, spectator sports and related ...	0	X	X
208267	2020-05-10	4807014	Castor	RURAL	Not applicable	447	Gasoline stations	0	0	0

# Data Sources

## Public Data Tables, Micro-data, and Data Visualizations

- Additional data may be sourced from StatCan, in order to accent our analysis with other variables.

Statistics Canada Statistique Canada

Subjects Data Analysis Reference Geography Census Surveys and statistical programs About StatCan Canada.ca

Home

### Subjects



**2021 Census:** Complete your questionnaire online today!

**COVID-19**  
A data perspective

**COVID-19: A data perspective:** Explore key economic trends and social challenges that arise as the COVID-19 situation evolves.

[Agriculture and food](#)  
[Business and consumer services and culture](#)  
[Business performance and ownership](#)  
[Children and youth](#)  
[Construction](#)  
[Crime and justice](#)  
[Digital economy and society](#)  
[Economic accounts](#)  
[Education, training and learning](#)  
[Energy](#)  
[Environment](#)  
[Families, households and marital status](#)  
[Government](#)  
[Health](#)  
[Housing](#)  
[Immigration and ethnocultural diversity](#)

[Income, pensions, spending and wealth](#)  
[Indigenous peoples](#)  
[International trade](#)  
[Labour](#)  
[Languages](#)  
[Manufacturing](#)  
[Population and demography](#)  
[Prices and price indexes](#)  
[Retail and wholesale](#)  
[Science and technology](#)  
[Seniors and aging](#)  
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[Transportation](#)  
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# Methodology

## Team Assignments and Tools & Technology

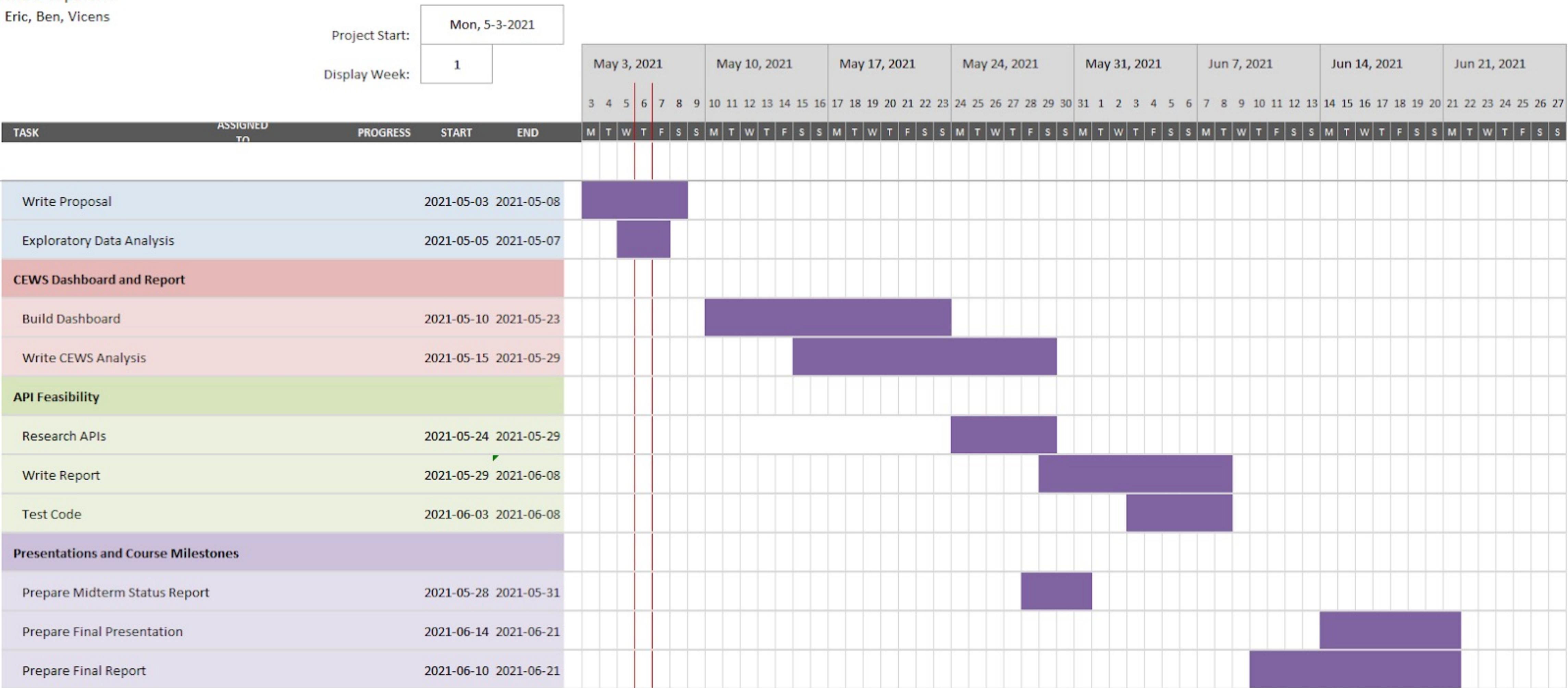
- **Team Assignments**
  - Team members will shift between tasks in order to optimize the ability to utilize each individual's skill set.
  - Assignments of individual team members will be considered with more detail on a weekly basis in order to optimize productivity.
- **Tools and Technology**
  - Google Docs and Slides.
  - Python and/or R (Jupyter Notebooks ad/or R Markdown files).
  - Microsoft PowerBI and/or Dash framework in Python and/or R.
  - Microsoft Temas and Zoom.
  - GitHub.
  - Toggle and/or markdown.

# Methodology

# Task Breakdown and Time Estimates

MDS Capstone

Eric, Ben, Vicens



# Methodology

## Deliverables

- **An interactive visualization dashboard** for the CEWS database.
- **A report** detailing our analyses of the CEWS data.
- **A feasibility study** for the use of APIs to predict economic activity, and potentially some proof-of-concept code.
- **A final report and presentation** detailing all aspects of the project.

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# Summary of Activities and Progress

May 3 - May 9, 2021

- **Project Proposal and Statement of Work**
  - Understood and assessed the problem.
  - Developed requirements and research questions to be examined.
  - Translated project objectives into a realistic plan and statement of work.
  - <https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/tree/main/proposal>
- **Exploratory Data Analysis**
  - Developed an understanding of the data.
  - Performed initial investigations on the data to discover patterns, spot anomalies and test hypothesis.
  - [https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/tree/main/code/CEWS\\_v1\\_0-eng](https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/tree/main/code/CEWS_v1_0-eng)
- **Personal Logs**
  - <https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/tree/main/personal-logs>

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# Roadblocks and Difficulties

May 3 - May 9, 2021

- **CEWS Database V.1**
  - Due to the prevalence of suppressed data, it is possible that any analysis may be misleading if there is any systematic method to data suppression.
- **CEWS Database V.2**
  - The complete dashboard and analysis are dependent on the release of a second set of CEWS data.
- **API Feasibility Study**
  - Possible accruement of cost from the use of paid APIs during research.
- **Microsoft PowerBI**
  - Learning and using a new tool will likely require assistance and further review.

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# **Planning and Action Items**

**May 10 - May 17, 2021**

- Continue exploratory data analysis.
- Begin insight generation and documentation.
- Begin work on CEWS dashboard.
- Finish proof of concept for CEWS dashboard.

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# Specific Assignments

May 10 - May 17, 2021

- **Bohan Gao**
  - Dashboard functionality and aesthetics (Microsof Powe BI).
- **Eric Baxter**
  - Visualizations and insights (geography lens)
- **Vicens Paneque**
  - Visualizations and insights (industry lens).

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# **Operational Problems**

**May 3 - May 9, 2021**

- Time-zone confusion.
- Missed client meeting.

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# Client Minutes

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- [https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/blob/main/meeting-logs/partner\\_meeting\\_week1.md](https://github.com/ubco-mds-2020-labs/w2020-data599-capstone-projects-statistics-canada-covid-19/blob/main/meeting-logs/partner_meeting_week1.md)

**Thank you!**