

CPSC 490: Senior Project Proposal

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Title: Interactive Visualization of COVID-19's Impact on the Caribbean Economy

Advisor: Dr Kim RM Blenman



Background

The COVID-19 pandemic has been an unprecedented health and economic crisis with devastating effects on tourism-dependent countries. Due to COVID-19, the number of international tourist arrivals declined by 73 percent in 2020, with 1 billion less travelers compared to 2019, according to the World Tourism Organization¹. The travel restrictions in place due to COVID-19 have had an even greater effect on the Caribbean region, which is so reliant upon tourism. In 2019, the Caribbean stood as the most travel and tourist dependent region

globally, with eight out of the ten most tourism-dependent countries in the world being located within the region. For example, tourism in the Caribbean Island of St. Lucia, accounts for approximately two thirds of the country's GDP. Like St. Lucia, many other island countries in the Caribbean have experienced a magnified economic downturn due to COVID-19.

There is a need for analytical data that helps identify the health and economic disparities that stem from COVID-19. This project aims to leverage data to create interactive visualizations that illustrate the economic, and health consequences of the global pandemic. By observing the short- and long-term implications of COVID-19's effect on health and tourism, comprehensive strategies can be developed to help enhance the financial resilience and wellbeing of the Caribbean in a sustainable manner.

Objectives

For my thesis, I will accomplish the following objectives:

1. Use data mining tools to determine the yearly influx of tourists in each Caribbean Island within the past 10 years including those on cruises and create interactive visualization tools to show the impact of COVID-19 through temporal changes.
2. Determine how COVID-19 impacted the health of Caribbean residents from January 2020 – September 2022: (A) number of and age distribution of COVID-19 positive cases, (B) number of patients hospitalized, (C) number of patients intubated, (D) number of hospitalized patients that recovered, and (E) number of patients who died. Visualization tools will be created for A-E showing changes in each health indicator from January 2020 – September 2022.
3. Determine the economic impact of COVID-19 by assessment of changes in gross domestic product (GDP), gross national product (GNP), consumer price index, and

monthly unemployment for the past 10 years. Provide interactive visualizations for each metric.

4. Combine the tourist influx, health impact, and economic impact from COVID-19 from January 2019 – September 2022 to visually show how these components together synergize to impact the Caribbean region.

I will determine the best visualization tools for the data after it has been collated. At minimum, D3.js² and Node.js³ will be used.

Logistics

- This is a 2-semester project. I will work on my 490 project 10 hours per week in person in Dr Blenman's Research Group from the week of Sept 16, 2022 for the Fall Semester and from the week of January 16 2023 for the Spring Semester.
- Dr Blenman and I will meet at least twice per week to discuss progress
- Deliverables
 - An extensive write up of all code with detailed commenting
 - Data analysis
 - Poster of results
 - Detailed report describing methods and results

Schedule

Week	Date	Deliverable
1	Sept 12	Meet with Dr Blenman to create project
2	Sept 19	Finalize project proposal
	Sept 22	Project proposal due at 12 PM
3	Sept 26	Work on Objective 1
4	Oct 3	Complete Objective 1
5	Oct 10	Work on Objective 2
6	Oct 17	Complete Objective 2
7	Oct 24	Work on Objective 3*
8	Oct 31	Complete Objective 3*

9	Nov 7	Work on Objective 4*
10	Nov 14	Complete Objective 4*
		Work on Poster
11	Nov 28	Final Poster Due to Dr Blenman
		Work on Report write-up
12	Dec 5	Work on Report write-up
13	Dec 8	Final Report Due to Dr Blenman
	Dec 9	Poster Presentation
14	Dec 15	Final Report Due
*Work on Objectives 3 and/or 4 will be continued in the Spring if work on Objectives 1 and 2 is still on-going on Oct 31		

References

1. World Tourism Organization

<https://www.unwto.org/news/2020-worst-year-in-tourism-history-with-1-billion-fewer-international-arrivals>

2. D3.js - <https://d3js.org/>

3. Node.js - <https://nodejs.org/en/>