**COMP 3925 Group 3 Group Project Summary**

# **Analysing the relationship between socioeconomic factors and COVID-19 outcomes: a data-driven investigation**

**Problem Statement**

COVID-19 has created a global pandemic, spreading rapidly across countries due to the increased connectivity thanks to modern technology and innovation.

Understanding COVID-19 data in different continents and countries, prepares mankind to face the next phase of the pandemic and prepare for potential outbreaks in the future.

**Research question**

How do the COVID-19 data differ between different continents and countries? Are there any significant patterns across different continents or countries?

**Datasets**

* <https://github.com/owid/covid-19-data/tree/master/public/data>
* <https://github.com/CSSEGISandData/COVID-19>

**Insight**

* **Wave Control**: The COVID-19 outbreak occurred in different waves, with the most severe wave from December 2021 to May 2022. Close monitoring of the outbreak's progress, early detection, and swift implementation of appropriate measures are crucial in preventing rapid virus spread. Understanding the timing and severity of high-impact periods can aid relevant authorities in preparing resources and strategies to mitigate public health impacts.
* **Regional differences**: Asia and Europe have shown varied virus spread and impact. Future response strategies should be tailored to regional characteristics like population density and healthcare infrastructure for more effective containment.
* **Reducing mortality rate**: Highly affected countries like the United States and Brazil require prioritizing early detection, healthcare system improvements, and access to medical resources.
* **Socio-economic factors**: GDP per capita influences COVID-19 infection and mortality rates. Addressing vulnerable groups through equitable access to healthcare, education, and economic opportunities can enhance epidemic response and recovery.
* **Population ageing**: Poses challenges during the epidemics, necessitating tailored plans for older populations regarding healthcare, social support, and vaccination campaigns.
* **Vaccination strategies**: Lower levels of the ageing population may lead to lower vaccination rates. Therefore, it is essential to consider demographic characteristics and ensure access for vulnerable groups through better vaccine distribution networks to improve overall protection.

**Recommendations**

* **Extensive collaboration, research funding, and resource allocation** between governments, health centers and organizations are crucial. The unexpected outbreak has shown that the top biggest economy powerhouses were vulnerable to COVID-19, underscoring the urgency of taking prompt, decisive action. Learning from the COVID-19 pandemic can create a more comprehensive international response to safeguard public health.
* **Investments to improve the healthcare infrastructure and workforce** are equally important, as there was a lack of hospitals, rooms, equipment, supplies and workforce to handle the peak of the COVID-19 outbreak. Governments and relevant parties need to work together and take action to prepare the nation better before another pandemic happens.
* **Big data and technology** are essential to pinpointing places with high risk, understanding the virus’s dissemination, and researching virus outbreak prevention. With the help of big data and the advancement of technology, such as Artificial Intelligence, hospitals, health centers, and universities can cooperate to predict better potential outbreaks, as well as new variants and antidotes to eradicate COVID or any other diseases.
* Governments and corporations can also **hold hackathons using COVID-19 and past disease data** to find new ideas or algorithms to predict COVID-19 outbreaks better and recognize future disease patterns.
* **Thorough planning and strategies** through **close monitoring** of pandemic waves, **vaccination distribution** and **monetary and social support** can protect and improve the people's livelihood. Focusing first on the groups vulnerable in health and socioeconomic factors can enhance preparedness, response, and community resilience, fostering a healthier and more secure future.

**Appendix**

# Visualization 1:

A pie chart with numbers and a few different colored circles

Description automatically generated

# Visualization 2:

A colorful pie chart with numbers and text

Description automatically generated

**Visualization 3:**

A map of the world with red dots

Description automatically generated

# Visualization 4:

A green line graph with black text

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# Visualization 5:

A graph of the country

Description automatically generated

# Visualization 6:

A blue line graph with white text

Description automatically generated

**Visualization 7:**

A blue bar with text

Description automatically generated

# Visualization 8:

# A graph showing the number of the fall of the year Description automatically generated with medium confidence

# Visualization 9:

# A graph with a line drawn on it Description automatically generated

# Visualization 10:

# A graph of a graph Description automatically generated with medium confidence

# Visualization 11:

A blue graph with white text

Description automatically generated

# Visualization 12:

# A graph with a blue line Description automatically generated

# Visualization 13:

# A graph with blue lines Description automatically generated

# Visualization 14:

# A screenshot of a computer Description automatically generated

# Visualization 15:

A pie chart with different colored sections

Description automatically generated

# Visualization 16:

A blue line on a white background

Description automatically generated*Fig19*

# Visualization 17:

It shows the recovery rate by country.

# A screenshot of a computer Description automatically generated

# Visualization 18:

# A blue line going up Description automatically generated

# Visualization 19:

A blue line graph with black text

Description automatically generated

# Visualization 20:

*A screenshot of a computer

Description automatically generated*

Visualization 21:

# **A screenshot of a graph Description automatically generated**

# Visualization 22:

# ***A screenshot of a computer Description automatically generated***

# Visualization 23:

# ***A screenshot of a computer Description automatically generated***

# Visualization 24:

# ***A screenshot of a computer Description automatically generated***

# Visualization 25:

# ***A graph showing recovery rate Description automatically generated***

# Visualization 26:

A screenshot of a graph

Description automatically generated

# Visualization 27:

# A screenshot of a computer Description automatically generated