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Progress Report I

PHIGHT COVID RESEARCH PROJECT

Lakdawala Lab - University of Pittsburgh
Department of Statistics & Data Science - Carnegie Mellon University

03/01/2021

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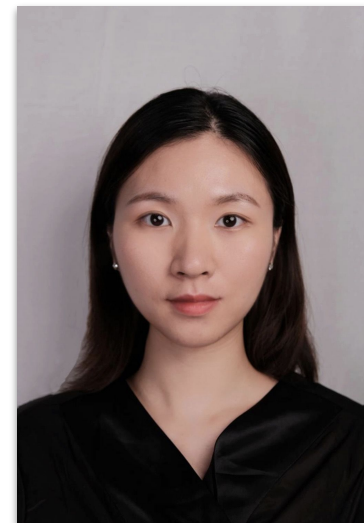MSP Student 2021
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Problem Understanding and Definition

- **Our project is subject to**

  Public Health Interventions aGainst Human-to-Human Transmission of COVID -19

- **Client wants to know?**

  How long does it take for interventions to take effect in controlling the transmission of COVID-19?

- **Deliverables**

  A model explaining the intervention impact, which can be used to generate interactive graphs

- **Who may benefit from the results?**

  PHIGHT COVID Website Users: Learn information from interactive graphs to help them assess the risks and to guide their behaviors

  Public Health Officials: Which intervention should be implemented and for how long?

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Issues and Objectives

- **Analyze when public health interventions (PHI) start to take effect**
  Try cubic spline regression model to find the knots (dates) which can explain the intervention occurrence via grid search

- **Model the effect of PHI on the transmission of COVID-19**
  Connect new deaths and new cases to describe the transmissibility

- **Develop recommendations intended for public health officials**
  Answer which PHI's are most effective and the expected time to take effect

- **Issue to be clarified with the client:**
  Why are we interested in modeling the lag time between new cases and new deaths?

- **Issue to be solved by the team**:
  How to measure the time lag between the start of an intervention and the point of time when that intervention becomes effective?

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Our Contributions

- **Help client to frame a feasible scope of project**

  How to describe transmissibility using daily cases/deaths and population data?

  What effect can be measured and detected?

  What indicates an intervention taking effect?

- **Analyze the new cases/deaths over time where government interventions occur**

  Find states with single policy intervention in a consecutive period of time

- **Create a model that explains the policy effect on reproduction number etc.**

  Start with spline method, linear models to more sophisticated epidemiology model

  Start with simple measurement versus time and move to causal inference

- **Create Visualization (collaborate with UG visualization team)**

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Technical Knowledge Evaluation

General Evaluation:

- Our clients have at least basic knowledge of statistical concepts.

- Our clients have a good understanding of Covid-19.

- A member in the client's team is proficient in data management.

- Technical Support from other stakeholders.

Client: Lakdawala Lab

- Dr. Seema Lakdawala: Familiar with basic statistical concepts and virus transmission mechanism.

- Annika Avery: Responsible for data management; unsure about familiarity with statistics.

Other stakeholders with technical support:

- Dr. Rebecca Nugent and UG Team have excellent knowledge of statistics and data science.

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Q/A

Thank You!