Exploring the Evolution in Sentiment Surrounding COVID-19 Vaccination via Longitudinal Analysis of Twitter Data

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Study Objectives

Problem: Negative sentiment toward COVID-19 vaccines can result in delayed vaccination and thus delayed herd immunity in the population.

> **Understand potential changes in COVID-19 vaccination sentiment across time**
> **Establish a timeline of vaccine-related events that may map on to changes in vaccine sentiment**
> **Examine whether inter-group differences in sentiment exist as a function of demographics**

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How is it Done? What are limitations?

- **Public access data sources for tweets**
- **Capture changing sentiments and moods by studying user timelines over time**
- **Identify themes using LDA modeling**
- **Sentiment analysis tools like VADER**
- **Biases may creep into the algorithms because some words have inherent negative connotations**

Novelty of Approach and Success

- **We will use ways to combat biases when measuring sentiment**
- **A pandemic like this happens once in a 100 years, hence there are a lot of unstudied topics about it**
- **Extensive dataset of 6 months of tweets to perform effective longitudinal analysis**

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Who Cares?

- CDC, WHO, and other governmental bodies
- The population
- The economy

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Impact of Success

- Help stakeholders (CDC,WHO,Governmental bodies) understand public sentiment regarding vaccines
- Inform public educational campaigns
- Improve sentiment regarding vaccines by dispelling misinformation and promoting scientific information

Project Plan

PROJECT TITLE Exploring the Evolution in Sentiment Surrounding COVID-19 Vaccination via Longitudinal Analysis of Twitter Data

9 | Mon, 2/1/2021

Display Week: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Phase 1 - Project Pitch				
Study the existing research in the area of anti-vaccination	Team	50%	2/1/21	2/8/21
Study data collection methods from Twitter	Team	60%	2/1/21	2/8/21
Project Pitch Preparation	Team	50%	2/1/21	2/7/21
Phase 2 - Data collection				
Acquire Data from Twitter	Team	0%	2/8/21	2/14/21
Format and clean Data	Team	0%	2/9/21	2/15/21
Phase 3 - Data exploration				
Exploratory data analysis	Team	0%	2/16/21	2/23/21
Data enrichment	Team	0%	2/16/21	2/23/21
Phase 4 - Data Modeling				
Identify features for data modeling	Team	0%	2/24/21	3/3/21
Data modeling	Team	0%	2/24/21	3/3/21
Phase 5 - Project conclusion				
Draw conclusions	Team	0%	3/3/21	3/10/21
Prepare report and presentation	Team	0%	3/3/21	3/10/21

Collecting Twitter Data

Access to data: Twitter API v2

We will be using hashtags like #vaccine #vaccination #COVID-19 etc. and limiting the data collection from July 2020 to Jan 2021

Previous research projects and success stories:

1. **Understanding toxic conversations to combat them** - Cardiff University
2. **Penn Medicine CDH uses Twitter data to understand the COVID-19 health crisis** - Penn Medicine Center
3. **Using Twitter Data to Study How People Adapt to Climate Change** - UC Davis

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Thank you!!
Link to presentation:
https://washington.zoom.us/rec/share/fVy83D39uq5dWUi6K4_epbDwffwGzQ1eXt0eACJ_-CE-Ne8NydA1soOxojn3qcJi.F0wJseVtp6Vw3iwL?startTime=1612758949000

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