

Misinformation about the COVID-19 Vaccine on Twitter

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Introduction

This project focused on identifying COVID-19 vaccine misinformation on social media, specifically healthcare workers on Twitter, and classifying their tweets based on support for the COVID-19 vaccine or concern/hesitancy. Misinformation was defined as incorrect or unverified information about something, which in our case was the COVID-19 vaccine. This type of false/ inaccurate information is a problem to vaccines because whilst researchers are producing these vaccines to keep society safe from the ongoing pandemic, those who spread false information about vaccines are easily persuading others to not get them. In the end, this only leads to solutions to the pandemic being delayed as well as puts in danger those most affected by the virus. The main goal for this project is to determine healthcare worker, specifically doctors and nurses who use Twitter, COVID-19 vaccine support or hesitancy and their common reasons for these opinions. We aim to help combat the rise of COVID-19 vaccine misinformation and the influence it has had on people who refuse the vaccine because of such information.

Background

COVID-19 is the most recent virus of the coronavirus family that has been spreading across the world. COVID-19 can be spread through close contact with a person who is infected and either coughs, sneezes, or even talks and their respiratory droplets land on either another person or on surfaces others touch.¹ Vaccines developed such as Pfizer and Moderna are mRNA vaccines which trigger immune response for protein making without needing to be injected with parts of the actual virus.² Both vaccines require 2 doses to be considered fully immune and they cannot be interchanged. The CDC reports Pfizer to have approximately 95% efficacy against contracting COVID-19 with severe symptoms, with Moderna following close behind at 94.1%.³ Despite these findings, many people continue to show hesitancy against either vaccine due to some patients reporting extreme symptoms and/or because of the vaccines continuing to be researched on and not yet finalized.

Method

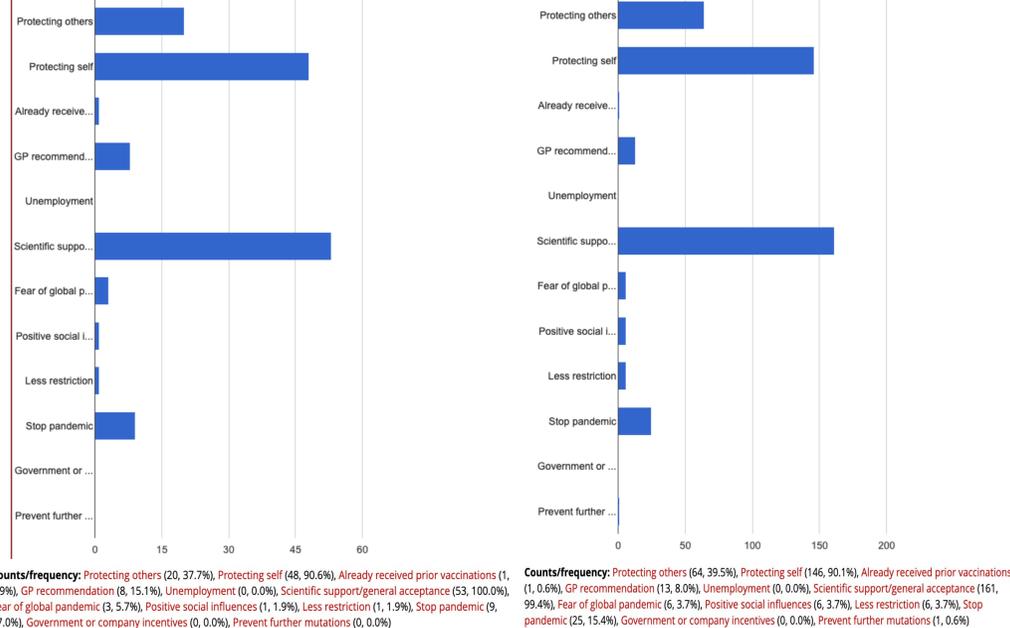
The tweets used in this project were chosen from a random set of more than 10,000 tweets extracted by a data gathering tool with inputs of "healthcare worker" and "covid19 vaccine". From those 10,000 tweets, student researchers were then each given a random set of approximately 2,900 tweets to categorize based on the post's contents.

Before the start of coding/ categorizing tweets, the student researchers had to develop a codebook by which these tweets could be identified based on their different characteristics. The main categories by which the tweets were analyzed from where:

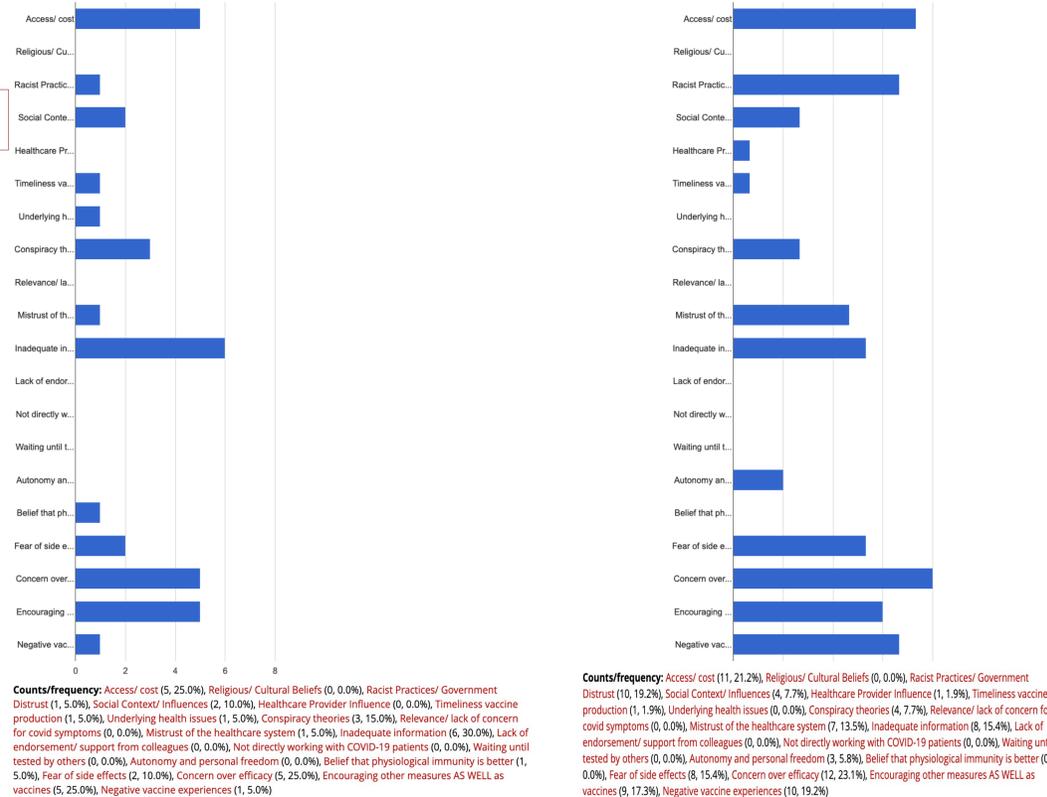
- Poster characteristics (Nurse, Doctor, medical assistant, parent, etc)
- General Sentiment (Positive, Negative, Neutral)
- Reference to distribution of Vaccine
- Does the post support/ show concern for CoV-19 vaccine?
- Reasons for support/ hesitancy
- Linguistic style of tweet (humor, statistics, links to external information, etc)

These sets of codes were then inputted to the database REDCap where categorization of the tweets would occur and data could then be extracted into a coding survey for the gathering of results. During the analysis of results, nurses and doctors were the focus of the data as they are major influences in the medical field and society for the COVID-19 vaccine.

Nurse (left) vs Doctor (right) Vaccine Support - Main Reasons



Nurse (left) vs Doctor (right) Vaccine Hesitancy - Main Reasons



Data Analysis

- After coding 1000 tweets and collecting characterizable data from 990 of them, I discovered that 107 of the 990 tweets were nurses, and 319 of the 990 tweets were doctors. Looking further into specifics for vaccine support/ hesitancy, I also discovered that 53 nurses displayed vaccine support, 20 displayed vaccine hesitancy, and the remaining 34 displayed neither in their tweets. Additionally, 162 doctors displayed support for COVID-19 vaccine, 52 doctors displayed concern/ hesitancy and the remaining 105 displayed neither. When analyzing nurse and doctor vaccine support, the data shows that two of the most common reasons between both occupations are to protect oneself from the virus and because of scientific support surrounding the vaccine as displayed by their tweets. As for nurses and doctors that displayed hesitancy for the COVID-19 vaccine, the most common reasons amongst nurses where inadequate information of the vaccine, concern over vaccine efficacy, and encouragement of other measures, such as masks, besides vaccines. Yet, the most common reasons amongst doctors were concern over vaccine efficacy, lack of access/ cost of vaccine, and negative vaccine experiences.

Conclusion

- The current data collected in this project is not final as I continue to code the remaining tweets in my set, meaning that no official conclusions can be made at the moment. However, the data I have gathered allows me to develop inferences as to how health care workers in the media influence opinions about the COVID-19 vaccine based on their common reasons for vaccine support or hesitancy. As I continue to finish coding the tweets, I will continue updating my poster with the new data I collect.

Acknowledgments

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References

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