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Data Science for Political Science
Final Project

Introduction

The COVID-19 pandemic has thrown much of, if not the entire world, into a public health crisis. And after a grueling period of telecommuting, lockdowns, quarantines, and frankly mania the introduction of vaccines for COVID-19 has been fast tracked. Despite approval from the FDA, these vaccines are still viewed with heavy skepticism from a considerable percentage of the population. Does age bear any influence on attitudes towards a COVID-19 vaccine? This question is important because in getting the population as close to herd immunity we must understand how groups of people feel, why they feel that way, and what policy can be implemented to bridge any gaps. As age increases I anticipate that hesitancy towards a vaccine will increase. It merits special attention because, if we are able to carefully analyze the available data and pick out patterns in skepticism, it might assist the rollout of the vaccine and ensure (rational) concerns are addressed.

The approach for this project centered around reported feelings of different age groups about the available vaccines: Johnson & Johnson, Pfizer, and Moderna. [Tracking how 18-29 year olds feel about vaccines for COVID-19 vs those who are in the 50-64 or 65+ cohort is how this was done.] This is important for the sake of a proper vaccine rollout and maximizing data for the parties that are tasked with getting the population to herd immunity. Maximizing as much data as possible could be crucial in preventing further spread, mutations, strains, and health risks. Also, It will allow more resources, attention, and care to be taken to the more skeptical and hesitant citizens.

Background

It is a well documented phenomena that the older age cohorts in the United States have been conservative in their political inclinations, along economic and social lines (Peterson et al., 2020). This is important to note when taking into consideration the media that makes them more likely to consume, specific media figures they get their news from, and the politicians they pay close attention to. All of this matters because certain sects of the mass media have been rampant in their criticisms of the vaccines, with much of the scorn falling on the severity of the pandemic and COVID-19 altogether. Politicians that align themselves with this narrative can influence those who are fanatical or even casual partisan onlookers. All of these things can warp a person's perception on such an important issue like the COVID-19 vaccines. It is very likely that the messaging deployed by these interests and figures have deeply permeated the collective mind of the populace. And disparities might be concentrated on their most saturated "market" or age group, for our purposes. This no guarantee, however, as the older age cohorts were most heavily impacted by the pandemic. They were more at-risk not only at being hospitalized but at higher risk of death due to the nature of the virus. It could very well be the case that this devastation felt in this sect of the population will propel their hesitancy into the lower end of the spectrum.

I anticipate that there will be a low starting point for =hesitancy among those aged 18-29, with hesitancy increasing steadily and perhaps plateauing in the higher age groups, 65+. If patterns begin to pop up and they follow a trend similar to those previously mentioned it can help policy makers and public health officials. This information allows them to see who appears most at risk not only of missing out on a vaccine but how that would impact supply and demand for the vaccines. It would be very important when keeping track of the national supply, inventory, and administration of the remaining vaccines. Another thing to consider is how these groups will fare in the near and distant future with infection and transmission rates. It would be very interesting to look back on this data in the future and see if any overly skeptical groups had any adverse impacts in the course of the pandemic and any future outbreaks or new strains.

Data and Approach

The data that was used in the project was from the Kaiser Family Foundation. This was a nationwide survey conducted in March of 2021 as a part of their routine surveys about health related issues in the US. They used a representative sample and interviewed people over the phone and asked a range of questions about the COVID-19 pandemic and vaccines. The survey had 1862 respondents in total, one per row on Rstudio. It also records their responses to the questions they were asked along with some descriptors like: race/ethnicity, partisan affiliations, age, religion, education, etc..

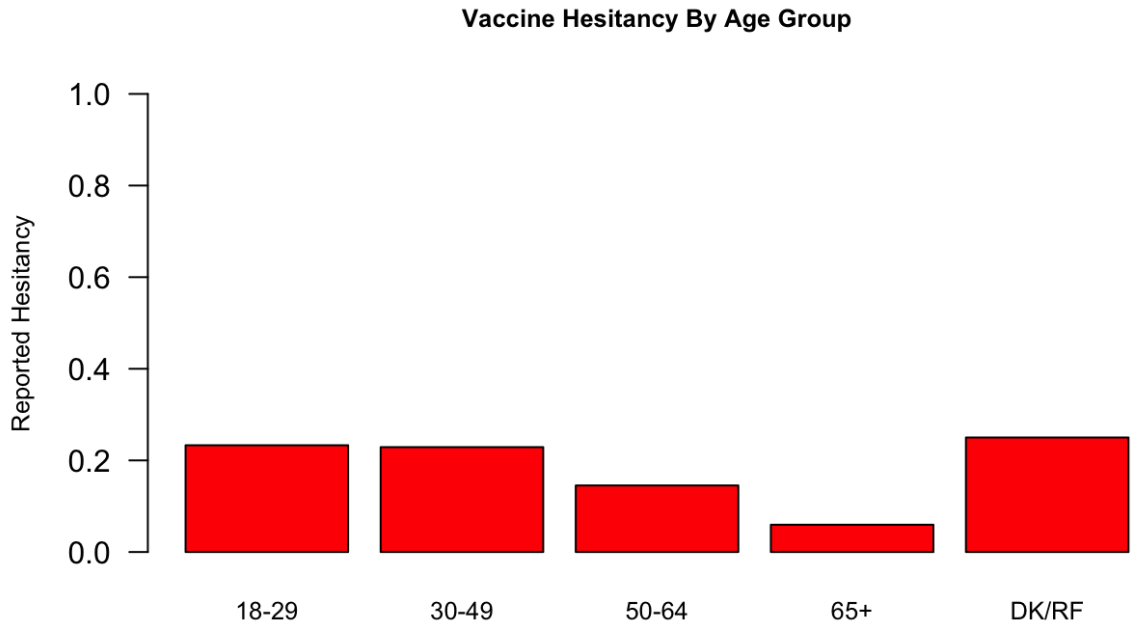
The key variables in question here are the ages of the respondents and their reported answers to questions concerning their willingness to get vaccinated. Another way of approaching this issue would be to simply check vaccination rates. Logically, if you are vaccinated you are not that skeptical and if you do not have it then that means you are likely skeptical and hesitant altogether. It is important to note that there are some limitations to this question. One of those limitations has to do with the fact that the rollout of the vaccine was focused heavily on getting the most at-risk members of the population at the front of the line. Some people also have difficulty in accessing the facilities and professionals with the appropriate resources. And given that the survey was conducted in the early stages of the vaccine rollout, it means that the younger cohorts were not able to get vaccinated even if they wanted to, unless they were high-risk.

In further investigating the first approach, the key variables that are going to be discussed are the respondents age, the age cohort they fall under (18-29, 65+, etc.) and their responses to question 17. The prompt offers 4 responses, numbers 1 and 2 are marked as receptive whereas 3 and 4 are marked as hesitant. The response also allows for an “I don’t know” answer and the ability to refuse answering altogether but do not make a huge mark on the results. The way this will be coded is by making an “ifelse” statement that categorizes their response to the question as “hesitant” if they responded “Only get the vaccine if you are required to do so for work, school, or other activities” or “Definitely not get the vaccine".

As was previously stated, there are issues in applying the data in this survey given the early stages of the vaccine rollouts at the time. However, this deals with it as best as possible, giving attention to all age groups and their respective attitudes towards the vaccine at that moment and it can also be used in comparing similar questions among respondents at later stages of the rollout. Means for hesitancy for different groups could change with the passage of time,

some people might move from the “Only get the vaccine if you are required to do so for work, school, or other activities” crowd to a “Wait until it has been available for a while to see how it is working for other people” response.

Results



This graph is a straightforward display of what was initially asked in the paper, vaccine hesitancy trends by age group. In creating this barplot, first the individual responded had to be categorized as “hesitant” or “receptive”. And then the mean recorded “hesitancy” for each age group was recorded and plotted on this plot by age cohort. The mean for the first group, 18-29, was 0.23308271, 30-49 was 0.22896282, while 50-64 was 0.14531549, and 65+ was 0.05956679. Essentially, the youngest age block (18-29) had a much higher percentage of their respondents express skepticism or hesitancy towards the vaccines. The trend noticeably regresses and by the time you reach the 65+ age group much of the hesitancy is undetectable.

The trend that was discovered does not support the original hypothesis. The age group with the highest mean of hesitant respondents was the youngest group, a decline being exhibited across the age cohorts and ultimately at the 65+ range, the mean is at a very low 0.05956679. The younger population was impacted like the older population when it comes to health outcomes and the COVID-19 pandemic. Infections, hospitalizations, and deaths were concentrated on the upper ladders of the age spectrum. This likely sheltered the younger population from deep fear of the virus and a desire to get a vaccine in order to return to some sense of normalcy.

Conclusion

Does age bear any influence on attitudes towards a COVID-19 vaccine? Well, the evidence is quite clear in refuting the initial hypothesis that hesitancy would increase with age. Hesitancy, as was defined with available questions and responses from the survey, peaked at the youngest age group and declined all the way through the oldest age group, 65+. The expectation was that due to the long-noted conservative attitudes of the older population combined with the rhetoric coming from conservative media and political figures, that they would be less receptive to vaccines. This was not an accurate assumption to be made, not one that has been borne out in the available data.

The limits with this data and approach surround the timing of the survey and general scope of the survey. This survey was conducted in March 2021 at the early stages of the vaccine rollout and it is possible that some of the data might have shifted with the passage of time, or perhaps respondents were more likely to give answers that they thought the interviewer wanted to hear. These are not overly concerning issues, and it likely did not impact the survey or the questions that were asked. The bulk of this information can be used by public health officials in guiding decision making with the rollout phase of the vaccine and subsequent safety procedures or protocols/mandates.

References

Peterson, Johnathan C., Kevin B. Smith, and John R. Hibbing. 2020. “Do People Really Become More Conservative as They Age?” The Journal of Politics, January. https://doi.org/10.1086/706889.