

STATS 209 Project Proposal

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Project Goals

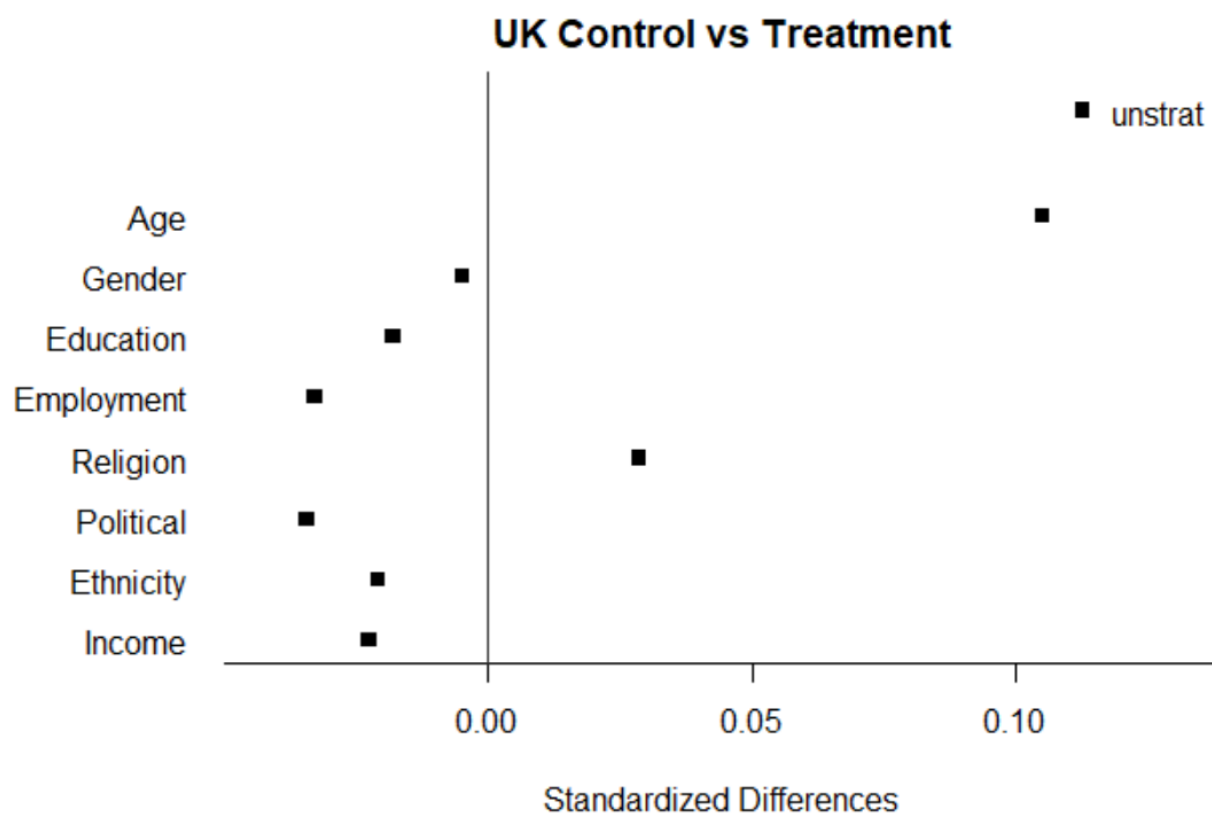
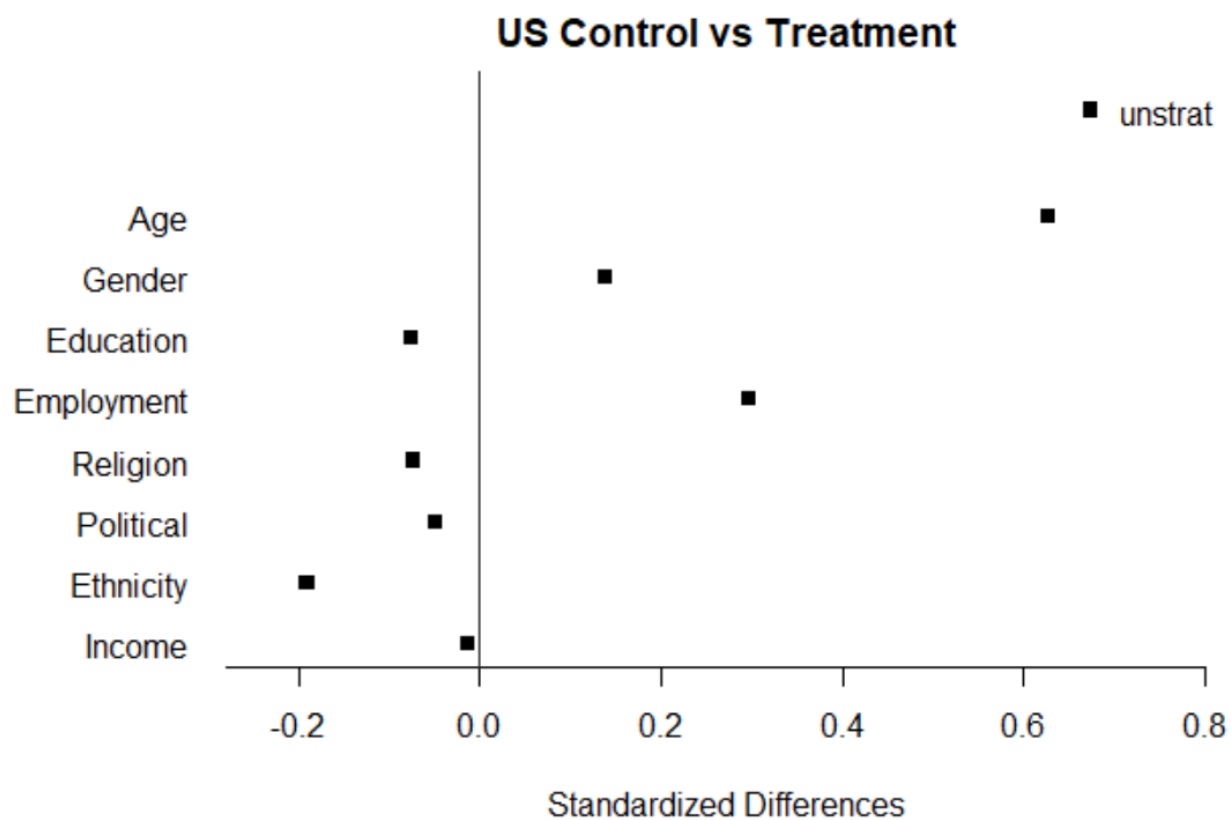
- 1) Reanalysis of the paper “[Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA](#)” to ensure **comparability** of treatment and control groups under varying factors.
- 2) Further explore different **heterogeneous treatment effects** on subpopulations of interest.

Data

We will be using the data from the paper “[Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA](#)” available at this [Github](#). This paper explores the causal effect of exposing individuals to misinformation about Covid vaccines on their intent to get vaccinated. The outcomes of the analysis are categorically ordered (“Yes, definitely”/ ”Unsure, lean yes”/ “Unsure, lean no”/ “No, definitely”) and background covariates such as age, sex, religion, political affiliation and employment were collected.

Overview

Pre-treatment beliefs and demographics are likely very important in determining the reaction to seeing misinformation, so we want to ensure our comparisons are matched correctly. We already see that the treatment and control groups have mismatches in several demographics:



As a first step, we will evaluate the covariate balance in the experiment and adjust for potential mismatches in the covariates to draw a more balanced comparison and compare the new estimates to the ones from the paper.

After proper adjustment, we can further explore heterogeneous treatment effects by defining more personas and seeing if different types of people respond differently to vaccine misinformation. For example, we can see if there is a larger change in vaccine intent for people that believed the misinformation vs those that did not.

Methods to Explore

Methods we want to explore include

- 1) Apply **regression adjustment** to account for covariates (Lin's Estimator)
- 2) **Explore matching** using different distance methods and weighing particular factors more than others
 - a) We want to make sure the control group and treatment group have balanced covariates/demographics. To do this, we will try to apply different distance metrics to narrow down the treatment group into units that are most similar to the control groups. This way, we will have a more fair comparison of response to our treatment.
- 3) Build a **propensity score**, employ caliper, and explore Horvitz Thompson/Hajek estimators. Propensity scores can help improve the estimates even when we already have a randomized experiment.
- 4) One complication is how to deal with an **ordinal response** (vs normal continuous responses we've seen in class). We will first binarize the response to see if there is a strict decrease in vaccine intent and perform our analysis on that.

Evaluation

We will baseline everything against fisher randomization. We can also compare our directional insights with the paper. We can see if we find additional subpopulation combinations that show larger response to treatment.