**Slide 2**

The motivation for this research came from noticing that studies featuring Susceptible-Infected-Recovered (SIR) models typically assume homogeneity in the probability of infection across the population. However, people vary in the behaviors that lead to disease transmission, including differences in social contact rates, mask usage, and vaccination uptake.

Our literature review revealed a lack of disease models that differentiate between Democrats and Republicans, despite evidence suggesting divergent health behaviors related to the pandemic between these two groups of people. This difference is particularly relevant given the observed disparities in excess mortality rates, which have been notably higher among Republicans in places such like Ohio and Florida.

Beyond categorical differences between Democrats and Republicans, there’s also some evidence that local population partisan context plays a role. For example, Ryan Baxter-King and collaborators found that Republicans are less likely to wear masks when they live in neighborhoods amongst other registered democrats.

Slide 3

So

**Slide 5**

To give you all a sense of the *magnitude* of difference between Republicans and Democrats, this plot here visualizes the estimated differences in contact rates between comparative groups. Each bar represents the subtractive difference between group A and group B, with positive values indicating higher contact in the first group relative to the second. For example, the 'Republican - Democrat' bar shown in red signifies a higher non-household contact rate among Republicans compared to Democrats. This gap is larger than gender and race-based differences, though not quite as large as young versus old.

**Slide 6**

Here, a negative value indicates a lower percentage of reported contacts carried out while the respondent was using a mask. This time, the biggest difference is between Republican and Democrat, where Republicans are wearing masks 10 percent less than Democrats.

**Slide 7**

Lastly, probability of vaccination differences is largest for young versus old but also large for Democrat versus Republican.

**Slide 8**

And this is despite Republicans being older on average compared to Democrats! They’re also more white, more male, less likely to be college educated or to live in dense urban counties. They also have *very slightly larger* household sizes (probably because they’re older). In the following results, we control for these, alongside county-level mask usage policy and logged per capita incidence rates.

**Slide 18**

Lastly, why does this matter and how does it fit into what we’re trying to do?

Slide 19

Contact rates, mask usage, vaccination, and population composition are all important parameters in disease models designed to