**Ideas:**

**Democrats after they area vaccinated**

**Interact incidence rate and wave**

**Restrict to sub 2020 and 2021**

**Before vaccination**

**Test extreme liberal / conservative interactions**

**Create categorical percent voted blue versus red plots**

**Slide 1**

Hello everyone, I’m Chris Soria, a graduate student in the Department of Demography at Berkeley. Today, I’ll present on some early work with co-authors listed here titled 'Political Beliefs, Partisanship, and Health Behaviors During the Pandemic.

**Slide 2**

As we all know, infectious diseases spread through close interpersonal contacts, and the risk of transmission increases with the frequency of these contacts, especially if precautionary measures aren’t taken. Disease models incorporate these factors to predict and describe the extent and rate of disease spread. However, our research was inspired by the observation that traditional disease models used during the pandemic often assumed that individuals within a population have the **same** chance of getting infected. However, different groups differ in the behaviors which can spread diseases. For example, during the pandemic people differed in their willingness to reduce contact with people beyond their household, whether they wore face-masks, and whether they got vaccinated.

Our literature review also showed that existing research utilizing these disease models does not differentiate between Democrats and Republicans, even though there's a lot of evidence of different health behaviors during the pandemic between these groups. This variation may have played a role in the higher mortality rates among Republicans that Wallace, Goldsmith-Pinkham, and Schwartz found in Florida and Ohio.

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 ZIP codes where other registered Republicans are the majority.

**Slide 3**

*In this study*, we aim to contribute to the conversation with the following research questions:

* How did individual political affiliation and local partisan context impact health behaviors during the pandemic? Specifically, non-household contact rates, mask-usage, and vaccination uptake.
* To what extent are partisan groups responsive to changes in COVID-19 incidence rates?
* How can the insights from the first two questions be integrated into disease models that account for partisan identification?

During this presentation, I’m going to focus primarily on the first question, but I’ll briefly talk about where we’re hoping to go with this, and I’m really interested in gathering feedback and suggestions on how to move this forward.

**Slide 4**

To answer this question, we used data from five separate cross-sections taken by the Berkeley Interpersonal Contacts Study (BICS), covering dates from June 2020 to May 2021. The 5 waves are presented in this plot here in the x axis, where the y axis represents the national 7-day average daily covid death counts and throughout it I added some key events. This data includes responses from a national sample, along with sub-samples from specific cities. For our analysis, we used the combined data from all these samples and to accurately reflect the national population, we applied weights and controlled for where the samples came from. It’s important to note that the survey started to ask about vaccination in its sixth round in May 2021.

**Slide 5**

Before I get to results, I just want to give you all a sense of the *magnitude* of the gap between Republicans and Democrats. This plot shows the raw differences **between comparative groups** in the number of contacts people had with those outside of their homes based on the day before the survey was taken. Each bar represents the subtractive difference between group A and group B, with positive numbers indicating higher contacts in the first group compared to the second. For example, the 'Republican - Democrat' bar shown in red signifies a higher number of non-household contacts among Republicans compared to Democrats. This gap is larger than gender and race-based differences, but not quite as large as young versus old, which were defining as 65 and older.

**Slide 6**

***If*** participants mentioned they had any contacts outside their home, they were then asked about their mask usage in up to three of those encounters.

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, the percent chance of vaccination differences are largest for young versus old but also large for Republican versus Democrat.

**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 metro urban counties, but their household sizes are similar.

Wait 5 seconds.

**Slide 9**

In the following results, we control for all of the previously mentioned factors, alongside county-level mask requirement policy and per capita incidence rates. In this early analysis, we employed multivariate linear models to derive estimated marginal means for key variables. We incorporated data from historical GitHub commits produced by Johns Hopkins to ensure that we were capturing information as it was being received by respondents in real time.

**Slide 10**

In the following results, first, I’ll present on non-household contacts, then mask usage, and finally on percent chance of vaccination. Democrats will always be in blue, republicans in red, and independents in green.

**Slide 11**

Here we can see that political party affiliation, on the x axis, is associated with differences in the number of non-household contacts, on the y axis, throughout the pandemic. We estimated that Republicans had an average of about 3.5 contacts compared to Democrats’ 2.5. The pattern holds in the adjusted model, as represented by the filled dots, compared to the unadjusted model with the hollow dots.

**Slide 12**

Contrary to other upcoming results, non-household contact patterns aren’t impacted by partisan context. For example, regardless of whether they’re in Democratic or Republican congressional districts, Democrats report the same average daily contacts throughout the pandemic.

**Slide 13**

When Democrats mention having any kind of contact with others, they also report a higher percentage of mask usage. In line with raw averages, Democrats use face masks around 10% more than Republicans when interacting with people beyond their household.

**Slide 14**

However, when Democrats are minorities in republican districts, their mask-usage rates move down to be more similar to the majority. And, when republicans are minorities in democratic districts, their mask usage is higher. In other words, both Democrats and Republicans are less likely to use masks when Republicans are the in the majority.

(Pause 5 seconds)

**Slide 15**

And for vaccination, democrats are much more likely to have reported being vaccinated as of May 2021 compared to both Republicans and Independents.

Slide 16

Interestingly, Democrats are more likely to get vaccinated when they live in Republican-majority areas, even though they wear masks less often in these areas. On the other hand, Republicans are less inclined to get vaccinated when they’re majorities amongst fellow Republicans.

**Slide 17**

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

**Slide 18**

The goal is for these findings to help us inform a disease model, which can help us understand how quickly infection can spread by predicting the number of people who will become infected over time and how the disease will progress through a population. However, without a solid understanding of what factors contribute to contact rates and preventative behavior adoption, we cannot produce accurate estimates.

As I hope I’ve shown in the previous slides, political affiliation is a major predictor of behavior during the pandemic and therefore important to account for in disease modeling.

In the bottom right, I'm presenting results from a basic heterogeneous SIR model that accounts only for differential contact rates. This model shows how such differences can lead to varied disease projections. Specifically, it illustrates that Republican prevalence rates peak higher, solely due to these varying rates of contact, which could translate to higher mortality rates.

**Slide 19**

Selection effect, where people are selecting where they live based on lifestyle preferences that are corelated with political preferences.

Another explanation is social pressure or public conformity, where republicans are adopting the mask-usage behaviors of democrats when they are in the minority but are doing so less often when they are in the majority.

Additional slide 1

Initially, our models without adjustments showed that Republicans seemed more likely to reduce their contacts as local infection rates went up—meaning, as the number of cases decreases, they tend to limit their social interactions even more. However, after adding more controls to our analysis to account for various factors, we found that both Democrats and Republicans do not significantly change their behavior in response to rising infection rates; their number of non-household contacts remains relatively unchanged.

The variable that’s most impactful to this shift in the coefficients is the wave, which implies that Republican’s responsiveness to incidence is primarily a temporal effect, only present during certain stages in the pandemic but not throughout.

Additional slide 2

And lastly, when it comes to mask usage, in the unadjusted models both Democrats and Republicans are similar in their increased percentage of mask usage as incidence rates go up. However, after adjusting adding controls, the results shifted. Democrats appeared unresponsive to rising case numbers in terms of changing their mask-wearing habits, while Republicans actually increased their mask usage when local incidence rates climbed.

This was a bit of a surprising result, as I was expecting the opposite. Again, changes over time—captured by the 'wave'—played a major role in these results. One possible explanation is that Democrats, who are more likely to get vaccinated, may feel less compelled to wear masks as a protective measure over time in response to new cases.