

Pre-Analysis Plan

Identifying and Addressing Structural Racism

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1. Introduction

Economists have worked from two dominant models to understand differences in outcomes across groups, conditional on similar economically-relevant attributes: taste-based discrimination (Becker 1957) and statistical discrimination (Phelps 1972, Arrow 1972). Under taste-based discrimination, individuals may have a preference to hire or be served by their own group. Statistical discrimination, a non-preference based model of discrimination, allows for different distributions of a trait for majority vs. minority groups, and also permits signals to be noisier for the minority (Aigner and Cain 1977). These properties can lead to different posterior assessments of the groups for the same draw (e.g. different ability assessments for similar test scores) if a decision-maker uses racial identity as a proxy for unobserved traits.

Interestingly, both of these models are from the vantage point of the majority group. They are tractable and focus on understanding group differences conditional on relevant factors. For example, these models typically include a focal agent, i , who is a member of a racial group, r , and presents with a set of economically relevant attributes, X . A decision-maker, j , may take into account the race and attributes of the focal agent. Outcomes, y_i , are (partially) determined by the decision-maker: $y_i = g_j(r, X)$. The primary focus in these standard economic models is on outcomes conditional on attributes: e.g., $E[y_i|X]$, but this abstracts from important differences in the distribution of attributes by race: e.g. $F(X|r)$. Thus, the scope for discrimination is narrowed to the decision-maker's preferences over race, observable attributes, or the predictive power of race for unobservable attributes. Such studies often conclude no discrimination conditional on attributes if $E[y|r = b, X] = E[y|r = w, X]$. For an extensive review of this traditional approach, its key assumptions, and the empirical literature that has followed testing for taste-based and statistical discrimination, see Charles and Guryan (2011). An important area of progress in the social science literature is work trying to understand that causal mechanisms that can produce either taste-based or statistical discrimination. For example, Ards et al. (2012) show in the context of child protective services that racialized perceptions by decision-makers (caseworkers) may give rise to racial disparities in children deemed maltreated.

However, as a means of thoroughly understanding discrimination, these models are incomplete and narrow. First, both approaches assume that economically-relevant factors exogenously vary a priori across groups. Second, differences in outcomes are the result of conscious choices by privileged, individual rational actors. The models sidestep the role institutions, culture, and their interactions may have in perpetuating the unequal distribution of such attributes or on the residual racial inequality

– that is, inequality not explained by attributes (Small and Pager 2020). By taking the perspective of advantaged actors acting rationally, economists are ill-equipped to study the consequences of existing structural arrangements for the “losers” of the status quo. This is important since “winners and losers” may have very different views on the same events. Conventional models assume that preferences and prior beliefs of the advantaged group are the default, i.e., common across both, and are unable to capture these nuances.

One of the difficulties economists might have in moving beyond the dominant paradigms is that there is not one definition of structural racism nor a mathematical formalization of it. However, when developing policies to improve outcomes for marginalized racial groups in the US, social policy researchers and policymakers must contend with the structural nature of racism. In this proposal, we use the term structural racism to refer to the interlinkages between culture, policy, and institutions that may reinforce each other and perpetuate racial inequity. This definition is informed by the work of Brayne (2014), Bonilla-Silva (1997), Cogburn (2019), Feagin and Eckberg (1980), Reskin (2012), Salter et al. (2018), and Small and Pager (2020).

One implication of these structural linkages is that signals about unequal treatment in one system may lead individuals to update negatively about another system. Another implication is that due to perceived beliefs about potential discrimination, individuals’ decisions and attributes that scholars assume are “exogenous” may in fact be endogenous to historical racism and further may be malleable to information that can cause an update in beliefs. Using this framework, we specifically operationalize “structural racism” as a cross-domain effect, acknowledging that other valid definitions exist though would require additional work to formalize and test experimentally. While admitting this is still limited in scope, we believe this represents a fundamental step forward in the field of economics given that the vantage point (the “decision maker”) is the person discriminated against and what is relevant is how they perceive signals and covariance across ostensibly disparate institutional settings. We apply this framework to study beliefs, outcomes, and their interlinkages across two systems in particular: the criminal justice system and the healthcare sector.

We focus on these two systems because they share common characteristics, such as individuals are vulnerable when in the custody/care of decision-makers in both systems; there are power asymmetries between those in custody and those in charge; authority figures swear an oath to protect and serve and do no harm; high stakes decisions are made rapidly, suggesting that implicit bias may play a large role in those decisions; there is a lack of diversity among authority figures; both systems have historical origins in racial inequity (e.g., medical doctors have helped reinforce theories of racial inferiority and police have enforced unjust laws); and Black men and women have unequal outcomes in both systems. Indeed, the criminal justice system is one of the key institutions generating racial inequality and an issue of pressing public policy (Anwar et al. 2012, Arnold et al. 2018, Edwards et al. 2019, Graham and Lowery 2004, Pierson et al. 2020). In addition, perceptions of unequal treatment have been shown in the economics, medical, and psychology literatures to affect health utilization, behaviors, and outcomes (Alsan and Wanamaker 2018, Arnett et al. 2016, Brodish et al. 2011, George et al. 2014, Hammond et al. 2010, Lewis et al. 2015, Nanna et al. 2018, Powell et al. 2019, Williams et al. 2019). Differences in care-seeking, particularly in preventive care and at early stages of illness, may be an important driver of racial health disparities along with documented differences in provider characteristics (Alsan et al. 2019, Bach et al. 2004, Chandra et al. 2020, Silber et al. 2014). Delayed care-seeking among Black and

Latinx populations has been a policy concern in combating the COVID-19 pandemic, as it may contribute to the disproportionate impact of COVID-19 among communities of color (Azar et al. 2020). Particularly relevant for the current proposal is recent work by Alang et al. (2020), who find in a survey that individuals who had negative encounters with the police report higher levels of medical mistrust, suggesting the importance of the linkages across systems.

As a motivating example for how structural racism can manifest itself, suppose, for example, that Black patients expect to be dismissed or misdiagnosed by doctors, perhaps due to historical racist treatment, either in the context of healthcare, or in other contexts such as policing, causing them to delay reporting to the hospital. Suppose as well, for sake of argument, that doctors ignore race completely, and simply follow a triage rule established by their hospital that renders patients who present beyond a certain stage of development of an illness as untreatable, and that these patients are disproportionately Black. In this case, we may observe worse health outcomes for Black patients, relative to, say, White patients, generating a racial gap in morbidity or mortality rates.

The preceding example highlights factors, e.g., the historical racist treatment of members of a particular group and the subsequent formation of beliefs by members of this group, and a race-neutral institutional policy (i.e. triage) with unequal effects on racial groups, that lead to differences in outcomes across racial groups, even in the absence of taste-based or statistical discrimination at the time at which the outcome of interest is determined. In this example, the traditional economics approach would conclude that there is no individual-level statistical or taste-based discrimination because the hospital uses a conditional, race-neutral decision-rule, and the hospital or doctor is the decisionmaker. The traditional approach taken by economists and other researchers studying the example above may conclude that there is no discrimination on the part of the doctor, and furthermore, a more limited scope for a policy intervention at the level of the doctor or hospital. For example, a hospital may conclude that they are not culpable for differential health outcomes of Black and White patients if they view economically relevant attributes as exogenous and pre-existing at the point of intervention without inquiry into why relevant attributes may be different across racial groups in the first place. Indeed, a recent study in the *New England Journal of Medicine* came to this very conclusion (Price-Haywood et al. 2020), finding that conditional on relevant attributes, there is no differential COVID-19 mortality rate for Black and White patients. But these conclusions presume that the decision to seek out care at a particular point in time is exogenous. Our example highlights that this is a questionable assumption, given the role that institutions, culture, and their interactions may have in perpetuating unequal outcomes across racial groups, either in the present or past (Small and Pager 2020). Our study aims to challenge this conventional wisdom and provide a conceptual framework and empirical support for the impacts of structural racism.

2. Conceptual Framework

Below, we present a simplified model that motivates our two-part experiment. We assume that society can be divided into different, but correlated, systems, building on past work such as Alang et al. (2020). Although a privileged group may view these systems as independent and news of unequal treatment as idiosyncratic, a marginalized group may view news of discrimination in one system as representing

draws from an underlying distribution of structural racism.

Let $\mu_c \sim N(C_0, \tau_c)$ be an individual’s view of the level of racial discrimination in the criminal justice system, with a system-specific prior mean and variance. Similarly, let $\mu_h \sim N(H_0, \tau_h)$ captures belief about racial discrimination in the healthcare system, with its own prior mean and variance. To capture correlation in beliefs across these two systems, we assume that the joint prior distribution of beliefs is normal (e.g., a bivariate normal distribution), with correlation parameter ρ_0 . We note that this correlation parameter ρ_0 is a direct implication of our chosen operationalization of structural racism, which is the informativeness of signals regarding unequal treatment across different institutions or systems.

How does receiving signals about unequal treatment in one system affect beliefs? Suppose the individual receives a draw of information about discrimination in the criminal justice system, either through personal experience or (and very importantly) indirectly through the experiences and knowledge of others from the same group: $y_1 \sim N(\mu_c, \sigma_y)$, where μ_c may now reflect the true mean of racial discrimination in the criminal justice system (Ang 2021, Bor et al. 2018).

It is straightforward to show that under Bayesian updating, the agent’s beliefs will update in the criminal justice system. Specifically, posterior beliefs about racial discrimination in the criminal justice system, C_1 , is a function of both priors and the signal: $C_1 = C_1(C_0, y_1, \tau_c, \sigma_y)$.

But updating of posteriors is not limited to the criminal justice system when beliefs are jointly distributed and correlated. The individual will also update beliefs about the healthcare system: $H_1 = H_1(H_0, C_1, \rho_1, \tau_h)$ where posterior beliefs about discrimination in the healthcare system, H_1 , are a function of healthcare priors, criminal justice posteriors, and the updated degree of correlation between the two systems, ρ_1 . Intuitively, if $\rho_1 > 0$, receiving a signal of high levels of discrimination in criminal justice implies that discrimination in the healthcare system is also likely to be high. Conversely, if $\rho_1 = 0$, the two systems are uncorrelated and healthcare posteriors should not be affected by a signal from the criminal justice system.

With this conceptual framework in mind, we have designed a two-part experiment to test for implications of the definition of structural racism in this model. Experiment 1 is meant to experimentally vary y_1 to shift C_1 and measure the potential effect on H_1 . Experiment 2 is meant to expose an individual to the same y_1 , but then subsequently shock the individual with information intended to reduce ρ_1 (the correlation between C_1 and H_1), to test whether belief updating can be halted or weakened. Experiment 2 will also test whether changed posteriors affect actual behavior, as described further below.

3. Interventions

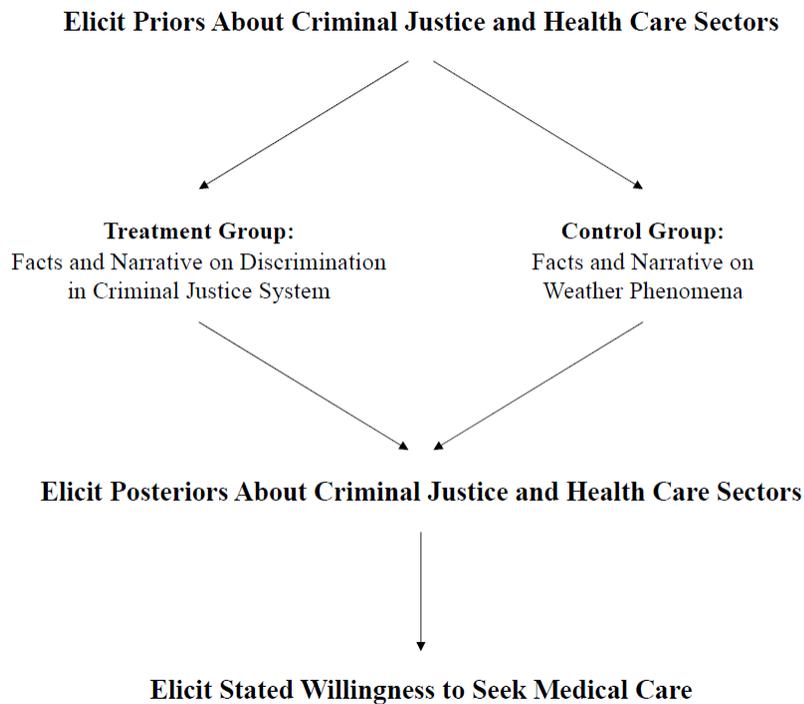
3.1 Experiment/Hypothesis 1

We hypothesize that in the presence of structural racism, a negative signal about one system will influence outcomes in the other. Our first experiment will elicit priors on experiences in the criminal justice system and the healthcare system and priors on how much race would advantage/disadvantage an individual in these systems, with a focus on understanding participant willingness to take up healthcare.

We will then randomize respondents to either a treatment or control group. The treatment group will receive a series of statistics and a narrative on racial inequality in the criminal justice system, and the control group will receive statistics and a narrative about weather phenomena orthogonal to racial inequities (i.e., a placebo). The narrative vignettes related to discrimination in the criminal justice system will be informed by details of actual cases of discrimination by Black men at the hands of the police, and will be produced by a local production company. We are also working closely with a writer specializing in narrating experiences of the Black community to draft vignettes that detail discrimination by police in an accurate and culturally-sensitive manner. Using the same actor and writer, we are developing a script about unanticipated experience with weather as the placebo.

After making salient racial disparities in the criminal justice system, we will again measure perceptions of racial discrimination in both the healthcare and criminal justice systems as well as other systems such as financial markets and education. These perceptions capture posteriors under our model. Finally, we will elicit stated willingness to engage in a range of activities, including willingness to seek medical care. Figure 1 displays how these different treatments are incorporated in the randomization design.

Figure 1: Treatment Design for Experiment 1



In the absence of structural racism, and/or the absence of perceived structural racism, individuals in the first treatment group may only update regarding criminal justice; however, if the two systems are “correlated” due to structural racism and if individuals internalize this correlation, i.e., if a signal in one system is informative about the distribution of outcomes of another, then making discrimination in the criminal justice system more salient will have spillover effects on perceptions of the healthcare system. Individuals in this group may then be less willing to seek medical care. This experiment is supported

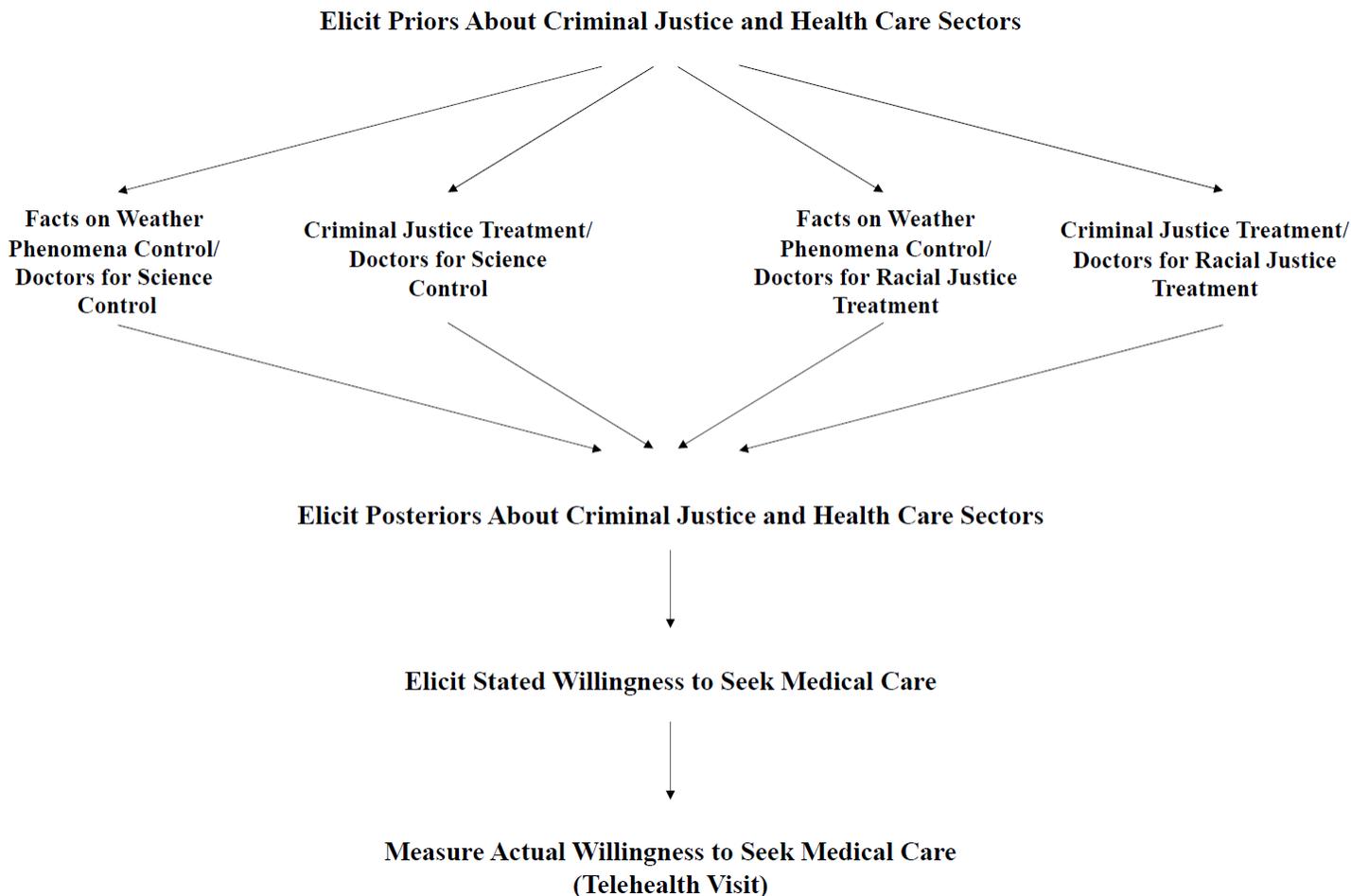
by past non-experimental work showing that experiences with the police are associated with higher reported levels of medical mistrust (Alang et al. 2020), and that higher medical mistrust is an important impediment to seeking care by marginalized groups and contributes to racial and ethnic health disparities (Alsan and Wanamaker 2018, Arnett et al. 2016, Bogart et al. 2016, George et al. 2014, Hammond et al. 2010, Nanna et al. 2018, Powell et al. 2019).

3.2 Experiment/Hypothesis 2

In the second experiment, we will test whether the information processing detected in Experiment 1 could be disrupted by making salient the actions of medical professionals who denounce racial discrimination. In this experiment, individuals will again be randomized into one of four groups: first, they will be assigned to one of the two experimental arms from our first experiment, and then separately randomized into a second treatment: in this second treatment, the treatment group will be shown images and a narrative video of doctors protesting against police violence in the wake of the death of George Floyd. The control group will be shown an unrelated narrative video of doctors protesting in support of science with a voiceover on the value of science and research.

As in Experiment 1, we will measure prior beliefs about experiences and the extent to which race affects treatment in the criminal justice system and health care systems. Following the treatment described above, we will then solicit posteriors. Finally, we measure the effect of this treatment on healthcare demand. In addition to measuring self-reported health demand as in Experiment 1, we will also measure actual take-up of a coupon for free telehealth services from a third-party provider, PlushCare. They are willing to provide discounted services in collaboration with our research team. In addition, and importantly, this telehealth provider is willing to create a signal of solidarity specific to their firm, with their doctors assisting in the narrative video for our participants in which they address the problem of structural racism in society, linking the treatment to the same healthcare provider to which participants will be given subsidized access. Given prior research, doctor visuals from the telehealth company will be race-concordant and this will not vary across arms. Figure 2 displays how these different treatments are incorporated in our randomization design.

Figure 2: Treatment Design for Experiment 2



We study the redemption of a telehealth visit because telehealth platforms will be an increasingly important service provider for healthcare, particularly among marginalized groups without health insurance. Data from consumer research firm CivicScience indicates that 39% of U.S. adults have adopted telemedicine as of this past January, up from 8% in 2019, and the DHHS reported recently that nearly half of Medicare primary care visits were provided through telehealth in April of last year. Physicians on these sites can provide a range of important health services, including diagnosis of COVID-19 and other urgent medical issues, maintenance of on-going chronic conditions such as diabetes, and prescribing medications. Recent work by Whaley et al. (2020) shows that use of telehealth medicine increased rapidly during the first two months of the COVID-19 pandemic relative to past years, serving as a substitute for or deferral of in-person care. Whaley et al. (2020) also show that despite this general increase in telehealth care, there are somewhat lower rates of telemedicine use among patients residing in zip codes with lower income and higher racial/ethnic minority populations. We believe that providing free telehealth visits to Black participants can help address these racial disparities and promote access to high-quality care.

3.3 Recruitment and Sampling

We are using a survey company to recruit a sample and to compensate subjects for their participation.¹ Our total target sample size is 1000 individuals for our first experiment and 7500 individuals for our second experiment. Reflecting the focus of our study on communities affected by racial discrimination, we aim for 80% of our respondents to be non-Hispanic African-American and 20% non-Hispanic white in Experiment 1. All respondents in Experiment 2 will be African-American.

As we are particularly interested in examining marginalized individuals who may be reluctant to access healthcare services due to structural racism, we will restrict our sample in both experiments to individuals without a college degree and who do not have a regular primary care physician. We will require all participants to be age 25 or older due to the restriction of our sample to adults without a college degree. All participants must be currently living in the United States.

Samples for both our experiments will feature the following additional characteristics:

1. 50% will be male and 50% will be female.
2. 50% will be drawn from the South (as defined by the U.S. Census Bureau) and 50% will be drawn from rest of the United States.
3. 19% will be drawn from individuals age 25-34, 35% will be drawn from individuals age 35-54, and 46% will be drawn from individuals age 55 or older.
4. 50% will be drawn from individuals with a total annual income of less than \$24,250 (the median income among all individuals age 25 or older without a college degree) and 50% will be drawn from individuals with a total annual income of \$24,250 or above.

3.4 Study Flow for Experiment 1

Our first experiment will have the following structure:

1. Recruitment and baseline survey
 - (a) Recruit target sample via a survey company.
 - (b) Collect demographic and health information.
 - (c) Elicit prior beliefs on discrimination in the criminal justice and healthcare systems.
2. Randomize subjects to treatment and control groups.
3. Endline survey
 - Measure posterior beliefs on discrimination in the criminal justice and healthcare systems.
 - Measure stated willingness to take up healthcare services.
4. Debrief script

¹We are currently in the process of vetting several survey companies.

3.5 Study Flow for Experiment 2

Our second experiment will have the following structure:

1. Recruitment and baseline survey
 - (a) Recruit target sample via a survey company.
 - (b) Collect demographic information and health information.
 - (c) Elicit prior beliefs on discrimination in the criminal justice and healthcare systems.
2. Randomize subjects into one of four groups: first, they will be assigned to one of the two experimental information arms from our first experiment, and then separately randomized into a second treatment.
3. Endline survey
 - Measure posterior beliefs on discrimination in the criminal justice and healthcare systems.
 - Measure stated willingness to take up healthcare services and actual demand for free telehealth voucher.
4. Debrief script

4. Data Collection

We plan to run our experiment beginning on summer/fall 2022. Data will be collected from respondent surveys administered via the survey platform Qualtrics. There will be short baseline module before the treatment group views the images or statistics. All survey responses will be downloaded as a .csv file for cleaning and analysis in Stata. Please see Appendix [A.1](#) and [A.2](#) for a working version of the two survey instruments.

4.1 Baseline Survey Variables

The baseline survey includes demographic characteristics, information about health status, and access to healthcare:

- Education
- Gender
- State and Zip Code
- Race and Ethnicity
- Total Income Over the Past 12 Months
- Pre-Existing Health Conditions
- Self-Reported Health Status
- Healthcare Usage Patterns
- Past Interactions with the Healthcare and Criminal Justice Systems

See Section [5](#) below for a summary of our key Endline survey variables.

4.2 Data Quality Checks

We will include two questions in the survey designed to capture respondent attention. The first will be asked prior to the treatment, while the second will follow the treatment. We will check that low-quality survey responses are not affected by the treatments. If they are not, we will exclude low-quality survey responses. We also plan to exclude those that take very little time on the survey, automatically screening out respondents who spend less than 30 seconds combined on the introduction, consent, and demographic modules of the survey. Individuals whose reported geographic information does not match that captured by their IP address may be dropped from the survey.

4.3 Attrition from the Sample

5. Empirical Analysis

5.1 Balance Checks

We will conduct a series of balance tests across treatment arms to ensure that there are no chance differences between subjects in the various arms. We will regress characteristics measured pre-treatment on indicators for the arms and test their individual and joint significance. Balance tests will be conducted using all of the variables measured in the baseline survey. Robustness of results to any possible chance unbalance will be checked by running the Belloni et al. (2013) Lasso procedure to select control variables.

5.2 Key Outcomes

We intend to measure the treatment effects on the following families of outcomes.

- Perceptions of racial discrimination in different systems — healthcare, criminal justice, and credit markets.
- Stated willingness to take-up the following services:
 1. Get a coronavirus vaccine if it were safe and freely available
 2. Go to the grocery store if running out of food
 3. Get a haircut if hair is getting too long
 4. Visit the dentist if had a tooth issue
 5. Seek advice from a doctor if feeling unwell
 6. Go to the emergency room if having an urgent medical issue
 7. Report a crime if one occurred
 8. Go to a restaurant if hungry
 9. Go to the bank to open a credit card account
- Actual willingness to take-up telehealth voucher (measured using data on redemption of individualized codes)

We will construct indices for each family of outcomes, where applicable, and will adjust inferences for multiple outcome testing.

5.3 Estimating Equations

Experiment 1

Using data from our first experiment, we will empirically test a key implication of our formalization of structural racism — i.e., correlation in beliefs across different domains and institutions. Specifically, we will estimate the following set of equations:

$$CJ_{posterior,i} = \alpha_0 + \alpha_1 CJ_{prior,i} + \alpha_2 Treat_i + \Gamma X_i + \epsilon_i \quad (1)$$

$$CJ_{posterior,i} = \alpha_0 + \alpha_1 1(CJ_{prior,i} < median) + \alpha_2 Treat_i + \alpha_3 (1(CJ_{prior,i} < median) * Treat_i) + \Gamma' X_i + \epsilon_i \quad (2)$$

$$HC_{posterior,i} = \beta_0 + \beta_1 HC_{prior,i} + \beta_2 CJ_{prior,i} + \beta_3 Treat_i + \beta_4 X_i + \epsilon_i \quad (3)$$

where $CJ_{posterior,i}$ denotes individual i 's perceptions of racial discrimination in the criminal justice system following treatment, $CJ_{prior,i}$ denotes individual i 's perceptions of racial discrimination in the criminal justice system prior to treatment, and $Treat_i$ is an indicator equal to one for individuals treated in the experiment.

In Equation 2, the interaction term between $Treat_i$ and an indicator for whether criminal justice priors are below the sample median $1(CJ_{prior,i} < median)$ allows us to test whether those with lower priors update more. Equation 2 also contains the un-interacted prior, measured as whether the criminal justice priors are below the sample median. Since individuals can update up or down based on their priors, coefficient α_3 in Equation 2 should isolate those who update differentially based on their priors and the disclosure of criminal justice statistics and narratives.

The variable $HC_{posterior,i}$ in Equation 3 denotes individual i 's perceptions of racial discrimination in the healthcare system following treatment and $HC_{prior,i}$ denotes individual i 's perceptions of racial discrimination in the healthcare system prior to the treatment. In both equations X_i is a vector of controls, such as individual characteristics.

For Equation 1, the main coefficient is α_2 , which suggests that our treatment moved posteriors on criminal justice. Since individuals can update up or down based on their priors, coefficient α_3 in Equation 2 should isolate those who update positively based on the disclosure of criminal justice statistics. In Equation 3, the coefficient of interest is β_3 . A positive sign on this coefficient would indicate that a signal on racial inequality in the criminal justice system affects beliefs about the fairness of the healthcare system, whereas a negligible or insignificant sign on β_3 would not lend support to our hypothesis.

Experiment 2

In our second experiment, we examine whether the relationship between and updating across systems can be weakened by providing messaging from physicians regarding racial equity. This will include photos of white coats for black lives, a national movement by medical professionals to protest racism,

as well as a video statement from the PlushCare CMO and other PlushCare doctors about their commitment to providing care that is equitable and their recognition of structural racism. We test whether sending a signal highlighting the existence of medical professionals who denounce racial discrimination will influence both the correlation across and the updating between the criminal justice and healthcare system using the following specifications:

$$Y_i = \gamma_0 + \gamma_1 HC_{prior,i} + \gamma_2 CJ_{prior,i} + \gamma_3 Treat_i^{cj} + \gamma_4 Treat_i^\perp + \gamma_5 Treat_i^{cj} * Treat_i^\perp + \gamma_6 X_i + \epsilon_i \quad (4)$$

$$\rho_i = \mu_0 + \mu_1 Treat_i^\perp + \mu_2 X_i + \epsilon_i \quad (5)$$

is an indicator for the treatment intended to reduce the dependence between the beliefs about the two systems. Y_i is the outcome for posterior beliefs (i.e. healthcare and other system posteriors) as well as take-up of telehealth services for oneself and demand for a family member. We plan to provide the participant with one coupon for a free telehealth service as well as the opportunity to obtain one for a member of the household. We intend to note that the first coupon is only to be used by the participant themselves and will be given to all participants. The second coupon will be disbursed on demand for those interested in obtaining one for a member of the household and represents an additional outcome. Through an arrangement with PlushCare, we can track all redemptions. Our key parameter γ_5 tests for the mitigating effect of counter signals from healthcare professionals on the spillovers identified in Experiment 1.

As an alternative test, we will also estimate Equation 6, where ρ_i is a proxy for the covariance in posterior beliefs in the fairness of the criminal justice and healthcare systems (measured as an indicator for whether both posteriors are above or below the sample median for each system). The coefficient of interest is μ_1 , which measures whether a positive signal about fairness in the healthcare system changes the covariance of interest. We hypothesize that treated individuals would exhibit a smaller correlation between the two systems (i.e. $\mu_1 < 0$).

5.4 Heterogeneous Effects

We are interested in understanding differences by baseline characteristics. We believe that there may be heterogeneous treatment effects based on many dimensions. The most important heterogeneous treatment effects are likely to be the following:

1. Age
2. Sex
3. Education
4. Those with priors on racial discrimination below vs. above actual levels
5. Healthcare issues and/or experience
6. Criminal justice issues and/or experience

Given the many ways to cut the data, we will follow the methodology of Chernozhukov et al. (2018) for this latter set of potential heterogeneous treatment effects.

6. Robustness

6.1 Threats to Interpretation

We would like to assume that differences across treatments suggest a model by which individuals from the minority group view two systems are correlated. Another possibility, however, is that we pick up an alternative effect, such as a fear of surveillance by formal institutions, or belief that health care is dominated by white individuals. To probe these mechanisms, we include the following questions in our survey:

Would you prefer children in your community to be tested for COVID-19 at their schools or local churches?

- i. School
- ii. Local church

This question probes the threat that people are oversurveilled and therefore do not want to seek out the police or physicians.

Which of these people do you think is the CEO of United HealthCare, the largest health insurance company in the United States?

- i. Picture of David Wichmann, CEO of UnitedHealth Group (a white man)
- ii. Picture of Kenneth Frazier, CEO of Merck (a Black man)

This question probes whether people do not want to seek out physicians because of a biased belief that all healthcare professionals are white.

7. Funding and Human Subjects Review

Funding for this project is provided by JPAL-North America and the Russell Sage Foundation. IRB protocols have been submitted to Harvard (#123456) and the University of Chicago (#789012) for this trial. Participation in the study is voluntary and all respondents need to have given their informed consent in order to participate. All information related to the survey will be kept on secure servers with only individuals on the study team granted access. Members of the study team will not have any access to any PHI or other information granted by participants to medical personnel should they choose to take up the free telehealth visit provided in our second experiment.

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A. Appendix

A.1 Survey Instrument: Experiment 1

Experiment 1

1. Introduction and Consent

This is a survey for academic research purposes. We are a non-partisan group of academic researchers. Our project is aimed at developing a better understanding of how people view issues differently, with a goal of improving access to important services that can benefit their lives.

Anytime you don't know an answer, just give your best guess. However, please be sure to spend enough time reading and understanding the question. Responding without adequate effort may result in your responses being automatically flagged for low quality, and we will only pay for high-quality responses.

This survey should take about 10-30 minutes to complete. You will be compensated with a \$5 electronic gift card that you can redeem at online retailers such as Walmart and Amazon if you complete the survey.

Survey Consent

We invite you to take part in a research study because we are interested in understanding opinions and beliefs on important national issues.

What should I know about this research study?

- Whether or not you take part is up to you.
- Your participation is completely voluntary.
- You can choose not to take part.
- You can agree to take part and later change your mind.

Our research project is aimed at learning more about opinions and beliefs on important issues, including equality in healthcare and other systems, which affect communities such as yours around the country. To participate you will be asked to answer a questionnaire. It is approximately 10-30 minutes long. We will ask your views on various topics that are relevant today. Some of the content will vary across individuals (i.e. pages shown or videos), so not everyone will see the same thing.

The most important risk is related to privacy. Information related to the survey will be kept in a secure server and only those on the study team will have access. We may remove identifiers for your private information and use data for future research studies. We would not ask for additional informed consent for such use. We may also show you statistics, images, or video clips about the United States that could be upsetting. Please remember that you may choose to leave the study at any time, should you feel uncomfortable.

There are no benefits to you from your taking part in this research. We cannot promise any benefits to others from your taking part in this research. However, possible benefits to others include new insight into how people view and interact with different settings.

Efforts will be made to limit the use and disclosure of your Personal Information, including research study records, to people who need to review it. We cannot promise complete secrecy. Organizations that may inspect and copy this information include the IRB and other organizational representatives.

If you agree to take part in this study, you will be paid for your time and effort via a gift card awarded at the end of the survey. If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at (617) 495-1100 or at marcella_alsan@hks.harvard.edu. This research has been reviewed and approved by the Harvard University Area Institutional Review Board (“IRB”). You may talk to them at (617) 496-2847 or cuhs@harvard.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.
- You want to get information or provide input about this research.

2. Demographics

- a. In what year were you born?
- b. What sex were you assigned at birth on your original birth certificate?
 - i. Male
 - ii. Female
 - iii. Other
- c. Please indicate which racial group you *most* identify with.
 - i. White
 - ii. Black or African American
 - iii. American Indian or Alaska Native
 - iv. Asian
 - v. Native Hawaiian or Other Pacific Islander
 - vi. Other [open text]
- d. Please indicate which ethnicity you *most* identify with:
 - i. Hispanic/Latinx
 - ii. Not Hispanic/Latinx
- e. What is the highest degree or level of schooling you have completed?
 - i. Less than 9th grade
 - ii. 9th to 12th grade, no diploma
 - iii. High school graduate or equivalent (for example: GED)
 - iv. Some college, no degree
 - v. Associate’s degree
 - vi. Bachelor’s degree or higher
- f. Please report your wages, salary, commissions, bonuses, or tips from all jobs over the past 12 months (report amount before deduction for taxes, bonds, dues, or other items).
 - i. Less than \$10,000
 - ii. \$10,000 to \$14,999
 - iii. \$15,000 to \$19,999
 - iv. \$20,000 to \$24,999
 - v. \$25,000 to \$29,999
 - vi. \$30,000 to \$39,999
 - vii. \$40,000 to \$49,999
 - viii. \$50,000 to \$74,999
 - ix. \$75,000 to \$99,999
 - x. \$100,000 to \$149,999
 - xi. \$150,000 or above
- g. Do you currently live in the United States?

- i. Yes
- ii. No
- i. [If yes to previous question] In which state do you currently live?

3. Background on Health Conditions

- a. In general, would you say your health is:
 - i. Poor, Fair, Good, Very Good, Excellent
- b. Have you EVER had or been diagnosed with any of the following conditions?
[Select all that apply]:
 - i. COVID-19
 - ii. Hypertension or high blood pressure
 - iii. High cholesterol
 - iv. Heart disease
 - v. Asthma
 - vi. Cancer
 - vii. Diabetes
 - viii. Chronic lung problems
 - ix. Kidney or bladder problems
 - x. Liver problems
 - xi. Arthritis of any kind
 - xii. Immune system issues such as HIV/AIDS
 - xiii. Back pain or muscle aches
 - xiv. I have not been diagnosed with any health condition
- c. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

4. Healthcare Experience

- a. Have you or your family members ever been admitted to the intensive care unit of a hospital?
 - i. Yes
 - ii. No
 - iii. Unsure
- b. In general, how would you rate *your* experience with the healthcare system so far:
 - i. Poor, Fair, Good, Very Good, Excellent, No Experience

5. Criminal Justice Experience

- a. Have you or any of your family members or close friends ever been stopped or arrested by a police officer, convicted of a crime, or sent to jail or prison?
 - i. Yes
 - ii. No
 - iii. Unsure
- b. How would you rate *your* experience with the criminal justice system so far?
 - i. Poor, Fair, Good, Very Good, Excellent, No Experience

6. All Priors

- a. How do you think you will be treated in each of the following situations? (I would be at a huge advantage, slight advantage, slight disadvantage, huge disadvantage due to my race; my race would not matter option) [Randomized order]

- i. In dealing with the police
- ii. In hiring, pay, and promotions
- iii. When applying for a loan or credit card
- iv. In stores or restaurants
- v. When voting in elections
- vi. When seeking medical treatment

7. Treatment v. Control

- a. Treatment Group: Criminal Justice Statistics + Narrative
 - i. Imagine, for a moment, that there are only 100 Black men living in the United States. How many, out of 100, do you think would be unfairly stopped by police due to their race? [Slider from 0 to 100]
 - ii. Now imagine that there are only 100 white men living in the United States. How many, out of 100, do you think would be unfairly stopped by police due to their race? [Slider from 0 to 100]
 - iii. The following text is then dynamically displayed: “Based on your answers, you think that Black men are X times more/as likely to be unfairly stopped by police due to their race compared to white men.”
 - iv. Facts provided on racial discrimination on the criminal justice system
 - 1. Example: A 2019 study by the Pew Research Center found that black men are 5.1 times more likely to have been unfairly stopped by the police due to their race compared to white men.

In another survey by researchers at Harvard University and the University of Chicago, nearly 80% of black men reported having been unfairly stopped by the police due to their race, compared to less than 20% of white men.

- v. Personal narrative on experiences with police violence.
 - 1. [BELOW VIDEO] “Please briefly describe what you saw in the video above.”
- b. Control Group: Lightning Statistics + Narrative
 - i. Imagine that 100 people were struck by lightning. How many do you think suffer serious long-term effects (but do not die)? [Slider from 0 to 100]
 - ii. Imagine that 100 people were struck by lightning. How many do you think would die to the strike? [Slider from 0 to 100]
 - iii. The following text is then dynamically displayed: “Based on your answers, you think that people are X times more likely to suffer serious long-term effects (but not die) than to die of a lightning strike.”
 - iv. Facts provided on weather
 - 1. Example: Lightning is one of the leading causes of weather-related deaths. People are 7 times more likely to suffer serious long-term effects (but not die) than to die of lightning strike.
 - v. Personal narrative on experiences with lightning strikes.
 - 1. [BELOW VIDEO] “Please briefly describe what you saw in the video above.”

8. Posteriors

- a. Please describe how you think you would be treated in each of the following situations. (I would be at a huge advantage, slight advantage, slight disadvantage,

huge disadvantage due to my race; my race would not matter option):
[Randomized order carried over from priors]

- i. In dealing with the police
- ii. In hiring, pay, and promotions
- iii. When applying for a loan or credit card
- iv. In stores or restaurants
- v. When voting in elections
- vi. When seeking medical treatment

9. Addressing Alternative Hypotheses

- a. Where would you prefer people in your community to be tested for COVID-19?
[Randomized order]
 - i. Local school
 - ii. Local church
- b. Which of these people do you think is the CEO of the largest health insurance company in the United States? [Randomized order]
 - i. Picture of David Wichmann, CEO of UnitedHealth Group (a white man)
 - ii. Picture of Kenneth Frazier, CEO of Merck (a Black man)

10. Stated Willingness to Seek Care and Other Activities

- a. How willing are you to do each of the following activities? [Very Unlikely to Very Likely, Randomized order]
 - i. Get a COVID-19 vaccine if it were safe and freely available
 - ii. Go to the grocery store if running out of food
 - iii. Get a haircut if hair is getting too long
 - iv. Seek advice from a dentist if had a tooth issue
 - v. Seek advice from a doctor if feeling unwell
 - vi. Go to the emergency room if having an urgent medical issue
 - vii. Report a crime if one occurred
 - viii. Take out food from a restaurant if hungry
 - ix. Apply for a new credit card/take out a loan if running low on cash
- b. Please indicate whether you think each of the following healthcare scenarios is more likely to happen to a Black or white patient. [Much more likely Black to Much more likely white, with equally likely option, Randomized order]
 - i. Doctors and healthcare workers hide information from a patient.
 - ii. Doctors and healthcare workers experiment on a patient without their knowledge.
 - iii. Doctors and healthcare workers do not take the medical complaints of a patient seriously.
 - iv. Doctors or healthcare workers treat a patient poorly or unfairly.
 - v. Doctors and healthcare workers use confidential information shared by a patient against him or her.

11. Demographics: Other

- a. What is your marital status?
 - i. Single, never married
 - ii. Married or domestic partnership
 - iii. Widowed
 - iv. Divorced
 - v. Separated
- b. How many other people do you live with?

- c. [If answer to previous question is not 0]: List all the people you live with.
 - i. Relationship
 - 1. Grandparent
 - 2. Parent
 - 3. Spouse/Partner
 - 4. Child
 - 5. Other relative
 - 6. Flatmate (non-relative)
 - ii. Age
 - iii. Gender
 - 1. Male
 - 2. Female
 - 3. Other
- d. Do you currently have a doctor who you regularly see?
 - i. Yes
 - ii. No
- e. Please enter your 5-digit zip code.
- f. What is your email address? This will be used to distribute payments upon the end of the survey.

12. Open-Ended Questions

- a. What do you think this survey was about?
- b. Were there any questions that you were confused about or didn't understand? Which ones were they?
- c. Do you have any feedback for us, or anything else to add?

A.2 Survey Instrument: Experiment 2

Experiment 2

1. Introduction and Consent

This is a survey for academic research purposes. We are a non-partisan group of academic researchers. Our project is aimed at developing a better understanding of how people view issues differently, with a goal of improving access to important services that can benefit their lives.

Anytime you don't know an answer, just give your best guess. However, please be sure to spend enough time reading and understanding the question. Responding without adequate effort may result in your responses being automatically flagged for low quality, and we will only pay for high-quality responses.

This survey should take about 10-30 minutes to complete. You will be compensated with a \$5 electronic gift card that you can redeem at online retailers such as Walmart and Amazon if you complete the survey.

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We invite you to take part in a research study because we are interested in understanding opinions and beliefs on important national issues.

What should I know about this research study?

- Whether or not you take part is up to you.
- Your participation is completely voluntary.
- You can choose not to take part.
- You can agree to take part and later change your mind.

Our research project is aimed at learning more about opinions and beliefs on important issues, including equality in healthcare and other systems, which affect communities such as yours around the country. To participate you will be asked to answer a questionnaire. It is approximately 10-30 minutes long. We will ask your views on various topics that are relevant today. Some of the content will vary across individuals (i.e. pages shown or videos), so not everyone will see the same thing.

The most important risk is related to privacy. Information related to the survey will be kept in a secure server and only those on the study team will have access. We may remove identifiers for your private information and use data for future research studies. We would not ask for additional informed consent for such use. We may also show you statistics, images, or video clips about the United States that could be upsetting. Please remember that you may choose to leave the study at any time, should you feel uncomfortable.

There are no benefits to you from your taking part in this research. We cannot promise any benefits to others from your taking part in this research. However, possible benefits to others include new insight into how people view and interact with different settings.

Efforts will be made to limit the use and disclosure of your Personal Information, including research study records, to people who need to review it. We cannot promise complete secrecy. Organizations that may inspect and copy this information include the IRB and other organizational representatives.

If you agree to take part in this study, you will be paid for your time and effort via a giftcard awarded at the end of the survey. If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at (617) 495-1100 or at marcella_alsan@hks.harvard.edu. This research has been reviewed and approved by the Harvard University Area Institutional Review Board (“IRB”). You may talk to them at (617) 496-2847 or cuhs@harvard.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.
- You want to get information or provide input about this research.

2. Demographics

- a. In what year were you born?
- b. What sex were you assigned at birth on your original birth certificate?
 - i. Male
 - ii. Female
 - iii. Other
- c. Please indicate which racial group you most identify with.
 - i. White
 - ii. Black or African American
 - iii. American Indian or Alaska Native
 - iv. Asian
 - v. Native Hawaiian or Other Pacific Islander
 - vi. Other [open text]
- d. Please indicate which ethnicity you most identify with:
 - i. Hispanic/Latinx
 - ii. Not Hispanic/Latinx
- e. What is the highest degree or level of schooling you have completed?
 - i. Less than 9th grade
 - ii. 9th to 12th grade, no diploma
 - iii. High school graduate or equivalent (for example: GED)
 - iv. Some college, no degree
 - v. Associate’s degree
 - vi. Bachelor’s degree or higher
- f. Please report your wages, salary, commissions, bonuses, or tips from all jobs over the past 12 months (report amount before deduction for taxes, bonds, dues, or other items).
 - i. Less than \$10,000
 - ii. \$10,000 to \$14,999
 - iii. \$15,000 to \$19,999
 - iv. \$20,000 to \$24,999
 - v. \$25,000 to \$29,999
 - vi. \$30,000 to \$39,999
 - vii. \$40,000 to \$49,999
 - viii. \$50,000 to \$74,999
 - ix. \$75,000 to \$99,999
 - x. \$100,000 to \$149,999
 - xi. \$150,000 or above
- g. Do you currently live in the United States?

- i. Yes
- ii. No
- h. [If yes to previous question] In which state do you currently live?

3. Background on Health Conditions

- a. In general, would you say your health is:
 - i. Poor, Fair, Good, Very Good, Excellent
- b. Have you EVER had or been diagnosed with any of the following conditions?
[Select all that apply]:
 - i. COVID-19
 - ii. Hypertension or high blood pressure
 - iii. High cholesterol
 - iv. Heart disease
 - v. Asthma
 - vi. Cancer
 - vii. Diabetes
 - viii. Chronic lung problems
 - ix. Kidney or bladder problems
 - x. Liver problems
 - xi. Arthritis of any kind
 - xii. Immune system issues such as HIV/AIDS
 - xiii. Back pain or muscle aches
 - xiv. I have not been diagnosed with any health condition
- c. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

4. Healthcare Experience

- a. Have you or your family members ever been admitted to the intensive care unit of a hospital?
 - i. Yes
 - ii. No
 - iii. Unsure
- b. In general, how would you rate *your* experience with the healthcare system so far:
 - i. Poor, Fair, Good, Very Good, Excellent, No Experience

5. Criminal Justice Experience

- a. Have you or any of your family members or close friends ever been stopped or arrested by a police officer, convicted of a crime, or sent to jail or prison?
 - i. Yes
 - ii. No
 - iii. Unsure
- b. How would you rate *your* experience with the criminal justice system so far?
 - i. Poor, Fair, Good, Very Good, Excellent, No Experience

6. All Priors

- a. How do you think you will be treated in each of the following situations? (I would be at a huge advantage, slight advantage, slight disadvantage, huge disadvantage due to my race; my race would not matter option) [Randomized order]
 - i. In dealing with the police
 - ii. In hiring, pay, and promotions
 - iii. When applying for a loan or credit card

- iv. In stores or restaurants
- v. When voting in elections
- vi. When seeking medical treatment

7. Treatment v. Control: Part I

- a. Treatment: Criminal Justice
 - i. Imagine, for a moment, that there are only 100 Black men living in the United States. How many, out of 100, do you think would be unfairly stopped by police due to their race? [Slider from 0 to 100]
 - ii. Now imagine that there are only 100 white men living in the United States. How many, out of 100, do you think would be unfairly stopped by police due to their race? [Slider from 0 to 100]
 - iii. The following text is then dynamically displayed: “Based on your answers, you think that Black men are X times more/as likely to be unfairly stopped by police due to their race compared to white men.”
 - iv. Facts provided on racial discrimination on the criminal justice system
 - 1. Example: A 2019 study by the Pew Research Center found that black men are 5.1 times more likely to have been unfairly stopped by the police due to their race compared to white men.

In another survey by researchers at Harvard University and the University of Chicago, nearly 80% of black men reported having been unfairly stopped by the police due to their race, compared to less than 20% of white men.
 - v. Personal narrative on experiences with police violence.
 - 1. [BELOW VIDEO] “Please briefly describe what you saw in the video above.”
- b. Control: Weather
 - i. Imagine that 100 people were struck by lightning. How many do you think suffer serious long-term effects (but do not die)? [Slider from 0 to 100]
 - ii. Imagine that 100 people were struck by lightning. How many do you think would die to the strike? [Slider from 0 to 100]
 - iii. The following text is then dynamically displayed: “Based on your answers, you think that people are X times more likely to suffer serious long-term effects (but not die) than to die of a lightning strike.”
 - iv. Facts provided on weather
 - 1. Example: Lightning is one of the leading causes of weather-related deaths. People are 7 times more likely to suffer serious long-term effects (but not die) than to die of lightning strike.
 - v. Personal narrative on experiences with lightning strikes.
 - 1. [BELOW VIDEO] “Please briefly describe what you saw in the video above.”

8. Treatment v. Control: Part II

- a. Treatment: Criminal Justice
 - i. Images of physicians and healthcare workers engaging in mass protest against police violence in the wake of the death of George Floyd
 - 1. [BELOW EACH IMAGE] “Please briefly describe what you see in the picture above.”
 - ii. Video of CEO of PlushCare presenting an antiracist statement

1. [BELOW VIDEO] “Please briefly describe what you saw in the video above.”
- b. Control: March for Science
 - i. Images of physicians and healthcare workers engaging in rallies in support of science.
 1. [BELOW EACH IMAGE] “Please briefly describe what you see in the picture above.”
 - ii. Video of CEO of PlushCare making a statement affirming the principles of science-informed policy.

9. Posteriors

- a. Please describe how you think you would be treated in each of the following situations. (I would be at a huge advantage, slight advantage, slight disadvantage, huge disadvantage due to my race; my race would not matter option):
[Randomized order carried over from priors]
 - i. In dealing with the police
 - ii. In hiring, pay, and promotions
 - iii. When applying for a loan or credit card
 - iv. In stores or restaurants
 - v. When voting in elections
 - vi. When seeking medical treatment

10. Outcomes

- a. Please indicate whether you think each of the following healthcare scenarios is more likely to happen to a Black or white patient. [Much more likely Black to Much more likely white, with equally likely option, Randomized order]
 - i. Doctors and healthcare workers hide information from a patient.
 - ii. Doctors and healthcare workers experiment on a patient without their knowledge.
 - iii. Doctors and healthcare workers do not take the medical complaints of a patient seriously.
 - iv. Doctors or healthcare workers treat a patient poorly or unfairly.
 - v. Doctors and healthcare workers use confidential information shared by a patient against him or her.
- b. Please indicate how much you agree with the following statements. [Strongly disagree to strongly agree, Randomized order]
 - i. Doctors have my best interest in mind.
 - ii. People like me cannot trust doctors and healthcare workers.
 - iii. People like me should be suspicious of modern medicine.
 - iv. People like me have been treated poorly or unfairly by doctors or healthcare workers.

11. Stated Willingness to Seek Care and Other Activities

- a. How willing are you to do each of the following activities? [Very Unlikely to Very Likely, Randomized order]
 - i. Go get a COVID-19 vaccine if it were safe and freely available
 - ii. Go to the grocery store if running out of food
 - iii. Get a haircut if hair is getting too long
 - iv. Seek advice from a dentist if had a tooth issue
 - v. Seek advice from a doctor if feeling unwell
 - vi. Go the emergency room if having an urgent medical issue

- vii. Report a crime if one occurred
- viii. Take out food from a restaurant if hungry
- ix. Apply for a new credit card/take out a loan if running low on cash

12. Demographics: Other

- a. What is your marital status?
 - i. Single, never married
 - ii. Married or domestic partnership
 - iii. Widowed
 - iv. Divorced
 - v. Separated
- b. How many people live in your household?
- c. [If answer to previous question is not 0]: List all the people you live with.
 - i. Relationship [dropdown list]
 - 1. Grandparent
 - 2. Parent
 - 3. Spouse/Partner
 - 4. Child
 - 5. Other relative
 - 6. Flatmate (non-relative)
 - ii. Age [numeric response]
 - iii. Gender [dropdown list]
 - 1. Male
 - 2. Female
 - 3. Other
- d. Do you currently have a doctor who you regularly see?
 - i. Yes
 - ii. No
- e. Please enter your 5-digit zip code.
- f. What is your email address? This will be used to distribute payments upon the end of the survey.

13. Open-Ended Questions

- a. What do you think this survey was about?
- b. Were there any questions that you were confused about or didn't understand? Which ones were they?
- c. Do you have any feedback for us, or anything else to add?

14. Measure Actual Demand for Telehealth Voucher/Subscription

- a. Offer telehealth voucher to respondents and one other household member (if applicable) and assess redemption/take-up data.