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Abstract

Narratives about Africa as dark, depraved, and diseased justified the exploitation of African land and people. Today, these narratives may still have a hold on people's fears about disease. We test this in three (pre-COVID-19) experiments (N = 1803). Across studies, we find that participants report greater worry about a pandemic originating in Africa (vs. elsewhere). In turn, they report greater support for travel bans and loosening abortion restrictions. We then document these narratives in an archival study of newspaper articles of the 2015-2016 Zika pandemic (N = 1475). We find that articles were more negative—for example, they included more death-related words—if they mentioned Africa. Finally, we replicate the experimental results within the COVID-19 context, using a representative sample (N = 1200). Taken together, the studies make clear that reactions to pandemics are biased, and in a way consistent with historical narratives about race and Africa.

Running Head: Racial Bias and Pandemics

Racial Bias in Perceptions of Disease and Policy

Africa, it seems, has been created as a unique space, as a repository of death, disease, and degeneration, inscribed through a set of recurring and simple dualisms—black and white, good and evil, light and dark (Vaughan, 1991, p.2).

European powers made and used claims about Africa, as a "repository of death, disease, and degeneration," to justify the colonization of Africa (Vaughan, 1991; see also Bonsu, 2009; Flint & Hewitt, 2015; Jarosz, 1992; Monson, 2017; Oguh, 2015; Savage, 2007). Today, these narratives are still with us. This was clear in the news coverage of the AIDS and Ebola crises (Harrison-Chirimuuta & Chirimuuta, 1997; Monson, 2017; Murdocca, 2003). For example, news reporting widely described Ebola as a disease originating in Africa, highlighting practices such as eating "bush meat" even though such practices were irrelevant to the spread of Ebola. As Seay and Dionne (2014) remarked, such reporting fits "a long and ugly tradition of treating Africans as savage animals and the African continent as a dirty, diseased place to be feared."

Claims about Africans and, later, Black people were likewise used to justify exploitation. Indeed, the classification of people into distinct racial groups was not formalized until slavery transitioned from a transitory state to a permanent and hereditary one. Scholars then used nascent theories of evolution to claim that the Negro was a separate and ancestral race, closer to apes, and that natural selection had eventually produced the more advanced European. Such claims were used to legitimize slavery, and the harsh treatment of enslaved men, women, and children (Fredrickson, 1989; Hudson, 1996; Kendi, 2017; Smedley & Smedley, 2005). Today, Black people continue to be dehumanized in subtle and not-so-subtle ways (Goff et al., 2008; Jardina & Piston, 2021).

In the present work, we consider whether these narratives still have a hold on people's fears about diseases: (1) are people more worried about diseases from Africa than elsewhere?, and (2) what are the consequences for policy preferences? We address these questions by building on the psychology of disease avoidance. That work suggests that fear of disease leads individuals to avoid unfamiliar outgroups that may threaten their immune system (Miller et al., 2007; Huang et al., 2011). Petersen (2017) shows that individuals view healthy members of an outgroup as equivalent to infected members of their own group. An obvious question is which outgroups are most vulnerable to this treatment. Work suggests this depends on how much an outgroup triggers fear of infection and/or germ aversion (Wang et al., 2018), and cultural context (Moran et al., 2021).

We connect this scholarship to a related line of inquiry on disgust. Disgust is a common reaction to health threats (Davey, 2011; Petersen, 2019). It directs attention towards the source of arousal (Strohminger, 2014; Xu et al., 2016) and away from new information (Casey, 2015; Clifford & Jerit, 2018). In the case of a disease whose origin lies with an outgroup, attention will be directed towards that source (i.e., the outgroup), almost with a hyper focus (Chapman et al. 2013). The ingrained narrative of Africa as a place of disease will thus lead people to react with strong aversion – one more pronounced than that towards other locales from which a disease may have originated (Schaller et al. 2003; Faulkner et al. 2004). This is exacerbated by the reality that many people respond to ethnic outgroups with the same kind of disgust they respond to disease (Aarøe et al. 2017; Taylor, 2007).

In short, we add an historical cultural caveat to scholarship that draws heavily on an evolutionary perspective. Work on prejudice and disease avoidance points to how the behavioral immune system evolved to minimize exposure to (unfamiliar) groups that may carry diseases (Kurzban & Leary, 2001; Faulkner et al., 2004; Schaller & Duncan 2007). Yet, all unfamiliar, potentially threatening groups (e.g., Faulkner et al., 2004) are not created equally. Instead, responses to outgroups depend on the historical context and that context in the U.S. paints Africa as a place of danger and disease.[1]

[1] In their discussion of the evolutionary perspective on disease, Schaller and Neuberg (2012) point out that "perceptions of threat may be influenced by idiosyncratic historical relations between different groups. A deeper discussion of these sociological subtleties is beyond the scope of this chapter" (p. 13).

One could make a similar argument for other unfamiliar, distant places, perhaps most notably East Asia. East Asians also have a history of being viewed as potential disease carriers (the "Yellow Peril" narrative). Examples include Greeley's 1854 *New York Tribune* infamous editorial comparing Chinese workers to African slaves, referring to them as "uncivilized, unclean, and filthy." This perception played a role in justifying the Chinese Massacre of 1871 and the Chinese Exclusion Act of 1882. We do not minimize the relevance and impact of these historic portrayals. We focus on Africa, in part, because narratives about Africa have been perhaps more consistent. The U.S. government repealed the Exclusion Act in 1943 to justify incarcerating Japanese Americans and to form an alliance against Japan by, in essence, dividing East Asians (Hong, 2019). The Asian narrative is further complicated by the model minority stereotypes that have become prevalent in the United States, even if inaccurate and potentially harmful (Kiang et al., 2017). In contrast, negative views of Africans and African Americans are so ingrained that Cramer (2020) urges work "to look beyond racism as an attitude, to how it functions as a lens or perspective through which people make sense of the world, including the political world" (p. 159). In three experiments, we include a comparison between Asia and Africa to assess potential similarities and differences, and acknowledge biases experienced by East Asians even with our focus on Africa.

We predict that racist narratives about Africa have acute cultural relevance in the U.S. and, thus, diseases from Africa will elicit particularly negative reactions. We focus on two policy domains: travel bans and loosening restrictions on abortions (for diseases that affect pregnant women and their fetuses). We include travel bans based on research showing that pandemics can be politicized to justify immigration reform (Murdocca, 2003; Green et al., 2010; Moran et al., 2021). Abortion restrictions are relevant for two possible reasons. The disease threat may trigger support for restrictions due to a fear that offspring pose a threat as disease carriers. This reflects a general devaluation of African lives and the policing of African bodies. Alternatively, it could be that support for abortion laws stems from a desire to protect the fetus from the disease.

Regardless, we predict that people in the U.S. will be more worried about diseases originating in Africa and, in turn, more likely to support travel bans and loosening restrictions on abortions (relative to diseases originating in other locations). In addition, we explore whether individual bias moderates these effects. Although we suspect the narrative is deeply entrenched in American culture, it is possible that it will manifest more among individuals with certain belief systems (Green et al. 2010). All data, materials, and analysis scripts can be found at https://osf.io/b35fs/?view_only=b279430d7a4441ebbebecea12ec0cc0e

Experiment 1

In Experiment 1, we examined people's reactions to a pandemic originating, allegedly, in Africa, Asia, Europe, or North America. That is, participants were assigned to one of four origin country conditions. We used the same description of a pandemic across conditions, holding disease symptoms, severity, and trajectory constant. This study, then, provides an initial test of how specific countries in the four continents —independent of a pandemic's stated symptoms, severity, and trajectory—shape people's worries about disease and their public policy preferences.

Method

Participants. Not knowing what effect size to expect, we aimed to collect 200 participants per condition. In February 2019, we recruited 803 participants via Amazon's Mechanical Turk (MTurk). MTurk provides an online platform in which "requesters" (researchers) can post tasks for "workers" (respondents). Social scientists post surveys (which are often survey-experiments) that workers can complete for money. Participants received $0.50 for their participation. The sample was 59% male and 79% white. Participants' ages ranged from 18 to 81 with an average of 37 (*SD* = 11.5). A post-hoc sensitivity analysis using GPower with α set to .05 and power ($1 - \beta$) set to .80 suggests that we can detect an effect as small as $f = .12$ equivalent to $\eta^2 = .01$. In other words, we can detect a small effect.

Procedure. After consenting, participants were randomly assigned to a condition. Specifically, they read a short article about a fictionalized disease originating in either Nigeria, Vietnam, France, or Mexico. The fictionalized disease was described as having a host of negative health consequences, like the Zika virus. The most notable health consequence was the impact on pregnant women and their fetuses. We adapted the article design from an online newspaper format by updating the content of their webpages to manipulate condition-specific details using HTML code. This was done to make the article look real. Next, participants answered survey questions about the disease. They were asked: (1) How worried about contracting this disease would you be if someone from [COUNTRY] moved to your community?, (2) How worried about contracting this disease would you be if someone in your community had recently traveled to [COUNTRY]?, (3) How worried about contracting this disease would you be if a coworker had recently traveled to [COUNTRY]?, (4) How worried about contracting this disease would you be if a neighbor had recently traveled to [COUNTRY]?, (5) How worried about contracting this disease would you be if a friend had recently traveled to [COUNTRY]?, and (6) How worried about contracting this disease would you be if your significant other had recently traveled to [COUNTRY]? Participants answered these questions on a four-point scale (3 = very worried, 2 = somewhat worried, 1 = not too worried, and 0 = not at all worried). Answers were averaged to create a composite ($\alpha = .96$).

Participants were also asked two policy-related questions: (1) Given the potential transmission of this disease, do you think the U.S. should place a travel ban on [COUNTRY]?, and (2) Given the potential transmission from pregnant mother to fetus, do you think [COUNTRY] should loosen restrictions on abortion? Participants answered Yes or No to these questions. Finally, participants answered demographic questions including race/ethnicity and political ideology (i.e., What is your political ideology? 1 = Extremely liberal to 7 = Extremely conservative). We control for race (White vs. non-White) and ideology in our analyses, but results hold when not controlling for them.

Results

Worry. To test whether condition affected self-reported worry, we conducted a one-way ANCOVA on worry, controlling for political ideology and participant race. As hypothesized, results revealed a main effect of condition, F (3, 796) = 6.77, $p < 0.0001$, $\eta^2 = .023$, *95% CI* = [.005, .045]. A Ryan's Q post hoc test—like a Tukey's post hoc test—showed that participants reported more worry in the Nigeria condition ($M_{Nigeria}$ = 1.62) than all other conditions (M_{France} = 1.41, $M_{Vietnam}$ = 1.32, M_{Mexico} = 1.26). See Supplemental Materials for post-hoc effect sizes.

Travel ban. For binary outcomes, such as support for a travel ban and for loosening abortion laws, logistic regression or OLS models like ANOVAs, ANCOVAs, and linear regressions produce similar results. Here, we use ANCOVA because its interpretation requires weaker assumptions (Angrist & Pischke, 2009) and because it provides reliable estimates of a variable's average effect (Allison, 1999; Mood, 2010; see Hoffman et al., 2016 for a similar approach). To test whether condition affected support for a travel ban, then, we conducted another ANCOVA on support for a travel ban, controlling for political ideology and participant race. Again, results revealed a main effect of condition, F (3, 795) = 6.78, p = 0.0002, $\eta^2 = .023$, 95% CI = [.005, .044]. A Ryan's Q post hoc test showed that participants were more willing to impose a travel ban in the Nigeria condition ($M_{Nigeria}$ = 0.34) than the France and Mexico conditions (M_{France} = 0.20, M_{Mexico} = 0.20). Participants in the Vietnam condition ($M_{Vietnam =}$ 0.28) fell in-between and did not significantly differ from those in the Nigeria, France, and Mexico conditions.

Abortion. We conducted a similar ANCOVA on abortion support, controlling for political ideology and participant race. Again, analyses revealed a main effect of condition, F (3,796) = 3.15, p = 0.025, $\eta^2 = .010$, 95% CI = [.000, .025]. A Ryan's Q post hoc test showed that participants were more willing to loosen restrictions on abortion in the Nigeria condition ($M_{Nigeria}$ = 0.70) than the France and

Mexico conditions (M_{France} = 0.58, M_{Mexico} = 0.57); participants in the Vietnam condition (M_{Vietnam} = 0.67) again fell in-between and did not significantly differ from those in the Nigeria, France, and Mexico conditions.

Mediation Analyses. To examine whether participants' worry mediated the effects of condition (Africa vs. elsewhere) on support for imposing a travel ban and loosening restrictions on abortion, we used the PROCESS macro to conduct the bootstrapping analysis and test (Model 4; Hayes, 2013). We drew 10,000 random samples with replacement to estimate the size of the indirect effect of condition on support for a travel ban and loosening restrictions on abortion. The bootstrap analysis yielded 95% confidence intervals that did not include 0 for either ban support or abortion (Ban: 95% CI = [0.25, 0.79], p = .011; Abortion: 95% CI = [0.04, 0.19], p = .0002). Taken together, these data suggest that a disease originating in Africa (vs. Europe, Asia, North America) led participants to worry about the disease more and, in turn, worry increased support for a travel ban and loosening abortion restrictions.

Experiment 2

In Experiment 2, we replicated Experiment 1 with two extensions: we recruited a sample from a different source and included individual difference measures related to dehumanization to see if there is individual variation in reaction.

Method

Participants. In February 2019, we recruited 196 participants from a participant pool. Participants received course credit for their participation. We used the participant pool for convenience and to assess robustness across samples. The sample was 25% male and 59% white. Participants' ages ranged from 18 to 23 with an average of 19 (SD = 1.0). A post-hoc sensitivity analysis using GPower with α set to .05 and power ($1 - \beta$) set to .80 suggests that we can detect an effect as small as f = .24 equivalent to η^2 = .06. In other words, we can detect a small-to-medium effect.

Procedure. The procedure was identical to Experiment 1 with the addition of race-related measures: beliefs in biological differences between Blacks and Whites (Hoffman et al., 2014), race as a biological vs. social construct (William & Eberhardt, 2008), and an explicit dehumanization scale (Kteily et al., 2015). We provide details of the measures in the Supplemental Material.

Results

We conducted the same analyses on worry (α = .95), support for a travel ban, and support for loosening restrictions on abortion as in Study 1.

Worry. Results revealed a main effect of condition, F (3, 183) = 4.26, p = 0.006, η^2 = .063, 95% CI = [.005, .128], such that participants reported more worry in the Nigeria condition (M_{Nigeria} = 1.55) than the Mexico and Vietnam conditions (M_{Vietnam} = 1.02, M_{Mexico} = 1.16); participants in the France condition (M_{France} = 1.26) fell in-between and did not significantly differ from those in the Nigeria, Mexico, and Vietnam conditions.

Travel ban. Contrary to hypothesis, results did not reveal a significant effect of condition, F (3, 183) = 0.52, p = 0.670, η^2 = .008, 95% CI = [.000, .035].

Abortion. Contrary to hypothesis, results did not reveal a significant effect of condition, F (3, 183) = 0.64, p = 0.59, η^2 = .009, 95% CI = [.000, .037].

Mediation Analyses. Although we found no direct effects of condition (African vs. elsewhere) on support a travel ban or for loosening abortion restrictions, it is possible that a condition increased worries that, in turn, increased support for these policies. In other words, it is possible that worry had an indirect effect on policy preferences in the absence of a direct effect of condition on policy support. To examine this possibility, we again used the PROCESS macro to conduct the bootstrapping analysis and test (Model 4; Hayes, 2013). We drew 10,000 random samples with replacement to estimate the size of the indirect effect of condition on support for a travel ban. The bootstrap analysis for the mediation analysis on support for the travel ban yielded 95% confidence intervals that did not include 0 (95% CI =

[0.28, 1.87], *p* = .024), consistent with mediation. In other words, although results did not reveal a main effect of condition on support for a travel ban, the mediation analysis suggest that, like Study 1 participants, Study 2 participants were more worried about a disease originating in Africa (vs. elsewhere) and these worries, in turn, were related to greater support for a travel ban.

The bootstrap analysis for the mediation analysis on support for loosening abortion restrictions yielded a 95% confidence interval that included 0 (95% CI = [-0.26, .15], *p* = 0.68), suggesting that worry did not have a mediating effect on support for abortion. It could be that Study 1 and Study 2 produced different results on this variable due to differences in sample characteristics; namely, relative to our Study 1 sample, our Study 2 sample is younger, more liberal, and had more women. It could be that younger liberal women have better-rehearsed, less-malleable attitudes toward abortion, and, hence, the lack of an effect on this variable.

Individual differences. To examine the role of relevant individual differences, we re-ran our primary analyses above but with individual differences first as covariates and then as moderators. We provide details in the Supplementary Material. Biological beliefs about race predicted worry across conditions and dehumanization of Black people predicted support for a travel ban in the Nigeria but not in the other conditions. None of our individual difference variables predicted support for loosening restrictions on abortion in the Nigeria condition or any other condition. Although spotty, these results cohere with the notion that racist ideas—specifically, biological beliefs about race and the belief that Black people are less human—shape perceptions of and reactions to disease.

Experiment 3

Experiments 1 and 2 suggest that diseases originating in Africa elicit greater worry, consistent with racist narratives about Africans and Africa. Another possibility, however, is that these worries stem from reasonable doubt about a country's ability to contain a pandemic: concerns about health and healthcare infrastructure, population density, travel, migration, and trade, and the like. In this study, then, we control for factors known to promote the spread of a disease to pandemic scale; that is, spread-related third variables (Jamison et al., 2017).

Methods

Participants. Like in Experiment 1, we aimed to recruit 800 participants on MTurk. In October 2019, we successfully recruited 804 participants. The sample was 59% male and 67% white. Participants' ages ranged from 19 to 75 with an average of 38 (*SD* = 11.4). A post-hoc sensitivity analysis using GPower with α set to .05 and power ($1 - \beta$) set to .80 suggests that we can detect an effect as small as f = .12 equivalent to η^2 = .01. In other words, we can detect a small effect.

Procedure. Experiment 3 procedure was identical to Experiment 1 with two exceptions. First, we replaced the articles with new articles and a new set of countries; specifically, Germany, Ghana, Brazil, and China. We did this to ensure that our results are not idiosyncratic to specific countries. Second, participants answered questions related to a country's ability to contain the spread of a pandemic. Specifically, they were asked (1) Overall, how densely populated is [COUNTRY]?, (2) Overall, how urban is [COUNTRY]?, (3) Overall, how much travel, trade, and migration are there to and from [COUNTRY]?, (4) How good is [COUNTRY's] public health infrastructure (capacity for identifying, tracing, managing, and treating cases)?, (5) How good is [COUNTRY's] healthcare infrastructure (including water quality and sanitation)?, (6) How good is [COUNTRY's] communications infrastructure (capacity for channeling information and resources)?, (7) How economically developed is [COUNTRY]?, (8) How corrupt (or not) is [COUNTRY's] government?, and (9) How effective (or not) is [COUNTRY's] government? Participants answered these on four-point scales with anchors *Not at all* to *Very* or *Poor* to *Excellent* depending on the question. Finally, participants answered demographic questions including race/ethnicity and political ideology. We did not measure individual differences in this study.

Results

We conducted the same analyses on worry (α = .94), support for a travel ban, and support for loosening restrictions on abortion as in Experiments 1 and 2.

Worry. Results revealed a main effect of condition, F (3, 798) = 13.66, $p < 0.0001$, $\eta^2 = .047$, 95% CI = [.020, .076], such that participants reported more worry in the Ghana condition ($M_{\text{Ghana}} = 2.85$) than in the other three conditions ($M_{\text{Brazil}} = 2.50$, $M_{\text{China}} = 2.46$, $M_{\text{Germany}} = 2.37$).

Travel ban. Results revealed a main effect of condition, F (3, 798) = 8.99, $p < 0.0001$, $\eta^2 = .029$, 95% CI = [.009, .053], such that participants were more willing to support a travel ban in the Ghana condition ($M_{\text{Ghana}} = 0.568$) than in the other three conditions ($M_{\text{Brazil}} = 0.395$, $M_{\text{China}} = 0.385$, $M_{\text{Germany}} = 0.378$).

Abortion. Contrary to hypothesis, results did not reveal a significant effect of condition, F (3, 798) = 1.21, p = 0.307, $\eta^2 = .004$, 95% CI = [.000, .014].

Mediation. We again used the PROCESS macro to conduct the bootstrapping analysis and test (Model 4; Hayes, 2013). We drew 10,000 random samples with replacement to estimate the size of the indirect effect of condition (African vs. elsewhere) on support for a travel ban and loosening restrictions on abortion. The bootstrap analysis yielded 95% confidence intervals that did not include 0 for either ban support or abortion (Ban: 95% CI = [0.42, 0.87], $p < .0001$; Abortion: 95% CI = [0.08, 0.28], $p = .0005$). Taken together, these data suggest that an African (vs. European, Asian, North American) disease led participants to worry about the disease more and, in turn, worry increased support for a travel ban and loosening abortion restrictions.

Controlling for spread-related third variables. To test whether these condition effects hold above and beyond spread-related third variables, we re-ran the analyses above but controlling for the nine spread-related factors. Results again revealed a main effect of condition on worry, F (3, 785) = 9.49, $p < 0.0001$, $\eta^2 = .033$, 95% CI = [.010, .057], such that participants reported more worry in the Ghana condition than in the other three conditions. Likewise, results again revealed a main effect of condition on support for a travel ban, F (3, 785) = 6.49, p = 0.0002, η^2 = 0.021, 95% CI = [.004, .041], such that participants reported more support for a travel ban in the Ghana condition than in the other three conditions. And, interestingly, results revealed a marginally significant effect of condition on support loosening abortion laws, F (3, 785) = 2.48, p = 0.060, η^2 = 0.009, 95% CI = [.000, .023] with means in the predicted direction; more participants in the Ghana condition supported loosening restrictions on abortion. Notably, adding spread-related control variables, in this case, strengthened the effect of condition on support for loosening restrictions on abortion. Mediation analyses also held (Ban: 95% CI = [0.38, 0.91], p < .0001; Abortion: 95% CI = [0.09, 0.30], p = .001).

Meta-Analysis

Next, we performed meta-analyses on Experiments 1, 2, and 3, as well as a replication of Experiment 3 not reported here collected in November 2019; the latter had a smaller sample size (N = 129) due to constraints on data collection (we launched the study at the end of the semester to provide participant pool participants more study options). We performed separate meta-analyses for each of the three dependent variables; namely, worry about the disease, support for a travel ban, and for loosening restrictions on abortion. We conducted the meta-analysis using the Comprehensive Meta-Analysis software (Borenstein et al., 2009). Because the study designs were identical, we performed a fixed-effects meta-analysis. This allowed us to estimate an overall effect size of condition (specifically, Africa vs. other conditions) on reported worries, support for a travel ban and loosening restrictions on abortions. Results revealed a reliable effect of condition on all three dependent measures. That is, results revealed a robust effect of condition on worry, b = 0.35, SE = 0.05, 95% CI = [0.24, 0.45], Z(4) = 6.55, p < .001, and a robust effect of condition on policy support, b = 0.34, SE = 0.05, 95% CI = [0.24, 0.44], Z(4) = 6.38, p < .001, and b = 0.16, SE = 0.05, 95% CI = [0.05, 0.26], Z(4) = 2.95, p = .003, for support of a travel ban and loosening abortion restrictions, respectively. These results support our predictions that people are more worried about diseases originating from Africa, and these worries shape policy support; in this case, support for a travel ban and support for loosening restrictions on abortion. See Table 1, Panels A, B, and C, respectively. That the abortion restrictions reflect direct worry about the disease suggests people are reacting out of fear of the disease and comfort with the policing of African bodies, rather than concern for the fetuses per se. [2]

[Table 1 here]

Archival Study

Experiments 1-3 provide experimental evidence that a disease emerging from Africa elicits greater worry (Experiments 1-3), above and beyond realistic concerns about spread risk (Experiment 3). Still, we recognize that these studies are limited. They rely on people's self-reports, which are subject to self-presentational concerns and introspective inaccuracy. They also rely on fictionalized diseases, although participants were led to believe the diseases were real. Moreover, one might worry—as we did—that Experiments 1-3 show only that people can be biased toward a disease originating in Africa due to the small amount of information received, not that they are biased toward diseases originating in or associated with Africa more generally.

Here, then, we take a different approach. We examine language around the Zika virus pandemic in 2015-2016. The Zika virus was first identified in Uganda in 1947. The first large outbreak of disease was reported in Micronesia in 2007. More recently, in 2015-2016, there was an outbreak in Brazil, which then spread to other South American countries and North America. Importantly, it never reached Africa. In other words, news coverage of the Zika virus during that time could have reasonably referenced Africa, because the virus had been discovered in Uganda, an African country. But, African countries were not responsible for responding (and not expected to respond) to the pandemic since they were not

[2] The less consistent results (between experiments) on abortion restrictions likely stems from reactions to disease focusing on the most proximate threat (Faulkner et al. 2004); abortion restrictions do less to reduce immediate danger than travel bans.

involved in this particular outbreak. We then examine how this pandemic was described and, importantly, whether it was described differently if Africa or an African nation was mentioned. If our experimental data reflect something real about the world and people's narratives about Africa, then we reasoned that news articles about the Zika virus that mentioned Africa or an African country or countries would contain more worry-related language.

Method

Research assistants searched for all articles about the Zika virus from nine newspaper outlets: *The Boston Herald, The Chicago Sun Times, The New York Daily, The New York Post, The New York Times, The Philadelphia Inquirer, San Francisco Examiner, The Wall Street Journal,* and *The Washington Post.* We chose outlets with large readerships, from geographically diverse regions, and with ideologically diverse leanings. All articles were saved as text files. In addition, research assistants checked all articles to confirm each was indeed about the Zika virus. In total, this yielded 1,475 unique articles about the Zika virus. Research assistants also searched the articles for the words Africa, African, and the names of all African countries. We then created two scores for each article: whether the article mentioned Africa, African, and/or an African country or countries (0 = No, 1 = Yes) and the sum of mentions (*Range* = 0 – 8). See descriptive statistics in Table 2.

[Table 2 here]

The text of each article was analyzed using the LIWC text analysis software (Pennebaker et al., 2001). Given our predictions, we focused on these LIWC codes: emotional tone, death-related words, and risk-related words. As an exploratory analysis, we also looked at use of personal pronouns, reasoning that articles that mentioned Africa or an African country or countries might use fewer personal pronouns, reflecting a less personalized—a more dehumanized—account. Again, see Table 2 for descriptive statistics.

Results

We ran two regressions, one using the dichotomous variable (Africa* mentioned, yes or no) and one using the continuous sum variable (number of times Africa* was mentioned). We regressed tone, death-related words, risk-related words, and, as an exploratory analysis, personal pronouns onto mentions of Africa, controlling for word count. Regression results can be found in Table 3. We also ran these regressions with outlet as a fixed effect and a mixed model with outlet as a random effect. Results are consistent across analyses. In other words, analyses suggest the results are not driven by a particular outlet. Here, then, we present simple regressions, which are most familiar and easiest to interpret.

[Table 3 here]

As can be seen, newspaper articles that mentioned Africa in their Zika coverage, as expected, were more negative in tone, used more death-related words, and fewer personal pronouns; they did not use more risk-related words, however. The latter was surprising given our experimental findings; recall that people reported greater worry about a disease originating in Africa vs. elsewhere. Still, these data are consistent with our claim that diseases associated with Africa are treated differently, as more worrisome and deadly, and associated with depersonalization and dehumanization.

Relevance to COVID-19

The above experiments and archival study were conducted prior to the COVID-19 pandemic. But clearly, these findings have implications for COVID-19. The findings suggest that responses to the pandemic—how worried people feel and what policies they support—might be partly determined by geography and, specifically, racist narratives tied to geography. To examine this possibility, we conducted another experiment. In October 2020, we recruited a nationally representative sample of people residing in the U.S. and randomly assigned participants to read about COVID-19 rates in some European or African country. Then, we asked them how worried they are about COVID-19, whether they would support a travel ban to curb the spread of COVID-19, and the extent of travel restrictions they would support. Travel restrictions had been a central question when it comes to international public policies even though it seems that "travel restrictions to COVID-19–affected areas [have] modest effects… for mitigating the epidemic" (Chinazzi et al., 2020, p. 400). We predicted that participants would be especially concerned about COVID-19 when hearing of its impacts in an African (vs. European) country and, as such, more supportive of a travel ban against Africans than Europeans and more supportive of travel restrictions for Africans than Europeans. We pre-registered the study at https://aspredicted.org/blind.php?x = sm5m92

Method

Participants. In October 2020, we recruited 2,410 participants from a non-probability but nationally representative internet panel overseen by Bovitz Inc. (http://bovitzinc.com/index.php). The sample was 48% male and 72% white. Participants' ages ranged from 1 (i.e., Under 18) to 6 (i.e., 65 and older) with an average of 4 (i.e., 35-50). The sample overall largely matched U.S census benchmarks on key demographics (see the Supplemental Material for details).

Procedure. Participants were randomly assigned to one of two experiments, one, as mentioned, examining COVID-19 responses in the context of country (a European country vs. an African country, N = 1,200), the other examining COVID-19 responses in the context of the U.S. (a state with a lower vs. higher percentage of Black citizens, N = 1,210). Here, we focus on the former, given if directly follows on the other studies in this paper, but we include the latter in Supplemental Materials (and we will briefly touch on the results in the conclusion). In the "country" experiment, participants were randomly assigned to read information about low or high COVID-19 rates in a European or African country. We opted for a European country as a point of comparison, but we recognize that had we used an Asian country, our results may have differed given the origins of the pandemic (and anti-Asian rhetoric and discrimination regarding the disease).

Participants read, "We are first going to describe a hypothetical democratic [European / African] country. This includes information about its infrastructure, demographics, and COVID-19 situation."

They were then given information about the country including, critically, information about COVID-19 positivity rates and death rates per 100,000. In the low COVID-19 rate condition, participants saw a table that suggested a 5% COVID-19 positivity rate and 60 deaths per 100,000; in the high COVID-19 rate condition, they saw a table that suggested a 15% COVID-19 positivity rate and 170 deaths per 100,000. Note that 5% was the positivity rate in the U.S. at the time of the study and 15% falls at the very high end of the distribution for COVID-19 positivity rates (information to which respondents were exposed). The study then was a 2 (European or African) X 2 (low or high COVID-19 rate) design. Our rationale for incorporating variations in the COVID-19 rates was to calibrate the size of the bias toward Africa against an objective baseline of threat. As explained, work on disease avoidance suggests that people draw more on extant information (e.g., the group is dangerous) than new information (e.g., actual vaccination rates). As Huang et al. (2011) explain that "disease-avoidance mechanisms occasionally 'misfire' against targets" (p. 1551). By assessing the impact of our hypothesized prejudice against a baseline we can examine just how much "misfiring" is involved.

After reading the country and COVID-19 rates, participants answered manipulation checks before answering our key dependent variables; namely, how worried they are about COVID-19 and how supportive they would be of a travel ban in addition to our spread-related variables.[3] Specifically, like Experiments 1-3, participants answered how worried they would be about contracting COVID-19 if a coworker, neighbor, or friend traveled to this country. They answered these questions on a 4-point scale with anchors ranging from *Not at all worried* to *Very worried.* They also answered two questions about travel bans: Do you think the U.S. should place a travel ban on this country? And, if the U.S. placed travel restrictions on this country, how do you think it should work? They answered the former on a 4-

[3] As per our pre-registration, we did not exclude participants who failed manipulation checks. Instead, we used our manipulation to ascertain participants were paying attention. Across conditions, 80%+ of our participants answered the checks correctly, suggesting that participants were attentive.
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point scale with anchors ranging from *Definitely no travel ban* to *Definitely a travel ban.* They answered the latter on a 5-point scale with the following options: *No travel ban, those from other country have to self-quarantine for 1 week, for 2 weeks, for 4 weeks, Do not allow entry to those from the other country for the foreseeable future.* Lastly, participants completed individual differences items; specifically, they completed a biological beliefs scale (Hoffman et al., 2016), a dehumanization scale (Kteily et al., 2015), and a Symbolic Racism scale (Henry & Sears 2002). Details are in the Supplementary Material. Participants also answered basic demographic questions.

Results

Here, we take a similar analytic approach as in Experiments 2 and 3. We regressed worry (α = .91) and support for a travel ban on condition (Africa vs. Europe), COVID-19 rate (low vs. high), and their interaction, controlling for ideology, participant race. We re-ran these analyses also controlling for spread-related third variables.

Worry. Results revealed a main effect of COVID-19 rate, F (1, 1192) = 22.54, p < 0.0001, η^2 = .02, 95% CI = [.006, .035], such that participants reported more worry in the high COVID-19 rate condition (M_{high} = 3.00) than the low COVID-19 rate (M_{low} = 2.78). Results also revealed a main effect of country, F (1, 1192) = 22.43, p < 0.0001, η^2 = .02, 95% CI = [.006, .034], such that participants reported more worry in the Africa condition (M_{Africa} = 3.00) than the Europe condition (M_{Europe} = 2.78). The interaction was not significant, F (1, 1192) = 3.04, p = .081, η^2 = .002, 95% CI = [.000, .011]. These results are striking in that they show that participants were as worried about COVID-19 in Africa as they were about high COVID-19 rates; they seemed to treat Africa as a high-rate country even when it was not, consistent with our claim that people see Africa as a diseased place. This finding is notable given that COVID-19 did not impact the African continent the way it had impacted other continents, in part because of African nations' strong COVID-19 response (see, for example, Pilling, 2020; Soy, 2020). A la our earlier discussion, we find a large amount of "misfiring" in threat assessment.

Travel ban. Results for support of a travel ban largely mirrored results for worry. Results revealed a main effect of COVID-19 rate, F (1, 1192) = 30.17, $p < 0.0001$, $\eta^2 = .02$, 95% CI = [.010, .044], such that participants reported greater support for a travel ban in the high COVID-19 rate condition (M_{high} = 2.94) than the low COVID-19 rate (M_{low} = 2.66). Results also revealed a main effect of country, F (1, 1192) = 18.98, $p < 0.0001$, $\eta^2 = .02$, 95% CI = [.005, .032], such that participants reported greater support for a travel ban in the Africa condition (M_{Africa} = 2.91) than the Europe condition (M_{Europe} = 2.69). The interaction was not significant, F (1, 1192) = 1.88, $p = .171$, $\eta^2 = .002$, 95% CI = [.000, .009]. Again, these results are striking in that they show participants' willingness to impose a travel ban on African countries as if African countries were high-risk, independent of the COVID-19 rate. Analyses for the travel restriction question revealed a similar pattern. Results for this variable are in Supplemental Materials.

Controlling for spread-related third variables. To test whether these condition effects hold above and beyond spread-related third variables, we re-ran the analyses above but controlling for the spread-related factors (as in experiment 3 above). Results again revealed main effects of COVID-19 rates and condition on worry, F (1, 1183) = 9.32, $p = .002$, $\eta^2 = .006$, 95% CI = [.0005, .018] and F (1, 1183) = 11.19, $p < 0.001$, $\eta^2 = .008$, 95% CI = [.0009, .020], such that participants reported more worry in high-rate condition and in the Africa condition. Likewise, results again revealed main effects of COVID-19 rates and condition on support for a travel ban, F (1, 1183) = 15.45, $p < 0.001$, $\eta^2 = .01$, 95% CI = [.003, 026], and F (1, 1183) = 8.24, $p = .004$, $\eta^2 = .006$, 95% CI = [.0004, .018], such that participants reported more support for a travel ban in the high-rate condition and in the Africa condition.

Mediation Analyses. We again used the PROCESS macro to conduct the bootstrapping analysis and test (Model 4; Hayes, 2013). We drew 10,000 random samples with replacement to estimate the size of the indirect effect of condition on support for a travel ban. The bootstrap analysis for the mediation analysis on support for the travel ban yielded 95% confidence intervals that did not include 0 (95% CI = [0.08, .19], $p < .001$), consistent with mediation. In other words, the mediation analysis suggests that participants were more worried about COVID-19 in Africa (vs. Europe) and these worries, in turn, were related to greater support for a travel ban.

Individual differences. To examine the role of individual differences, we re-ran our primary analyses above but with individual differences as covariates and then as moderators. We report the results in the Supplementary Material. Overall, individual differences measures paint a complicated picture although, consistent with our premise, biological beliefs about race were associated with greater worry about COVID-19 in the Africa vs. Europe conditions, and also support for a travel ban. We note, however, that these were statistically small effects and so our conclusions are tentative.

General Discussion

In the present work, we find that people report greater worry for a pandemic originating in Africa (vs. elsewhere). In turn, they report greater support for a travel ban and loosening abortion restrictions. These results hold when controlling for third variables including perceptions of a country's healthcare infrastructure, government effectiveness, population density, travel, trade, and migration. In addition, in an archival study of the 2015-2016 Zika pandemic, we find that newspaper articles about the Zika virus were more negative—they included more death-related words, used a more negative tone, and fewer personal pronouns—when they mentioned Africa or an African country. These findings are consistent with narratives about Africa as a diseased continent—racist narratives used to justify the colonization of African land and people. They are also consistent with qualitative and descriptive research, documenting the ways in which various pandemics have been racialized and weaponized for ideological gains (Murdocca, 2003).

Moreover, we find that these findings generalize to the context of COVID-19. Among a representative sample of people in the United States, we find that respondents were more worried about COVID-19 and more supportive of a travel ban after reading about COVID-19's impact on an African (vs. European) country. These findings are important because they extend our experimental findings to a real-world context. They suggest that geography—and racist narratives about geography—shape the public's response to disease, even when people have a relatively large amount of information about a disease and are experiencing a relatively high level of worry about a disease. From an applied perspective, these findings have clear implications for public discourse, as we respond to a global pandemic and think ahead to the next one. Worries about pandemics are legitimate—pandemics can be devastating—but policies should not be guided by racist narratives.

These results dovetail nicely with work in social psychology. This work finds that Black people are often stereotyped as threatening (Devine, 1989). Recently, work has shown that this stereotype about people can apply to spaces; Black spaces—like Black neighborhoods—are also stereotyped as threatening (Bonam et al., 2016). Here, we find that this stereotype applies to diseases from a majority-Black continent, and in way consistent with racist narratives used to exploit African land and people.

The present work, as such, responds to recent critiques in social psychology as well as political science. Scholars across these disciplines have urged researchers to move beyond individual attitudes and bias and look to historical narratives and cultural forces that shape race relations today (Adams et al., 2008; Cramer, 2020; Leach, 2002; Salter & Adams, 2013; Tileagă, 2013). The present work does this. It offers a historically situated analysis. It shows that racist narratives from long ago exist in individual psychology today. This is interesting and important, both theoretically and practically. We suspect that most participants in our studies did not know about the long and racist history of this narrative—the narrative of Africa as a diseased place. What our results show, then, is that many people now hold beliefs that further this narrative's reach into contemporary policies and outcomes. As such, our approach shows the relevance of accounting for cultural and historical context when using an evolutionary perspective. Much extant work on disease avoidance and xenophobia invokes evolutionary psychology (e.g., Schaller & Neuberg, 2012). Such work might benefit from considering the historical context that shapes contemporary understandings of threats.

Our results also raise several questions for future research. First, we did not find evidence of bias against diseases originating in Asia, although we acknowledge the historical presence of racist narratives about diseases originating in Asia. These narratives may have been increasingly accessible due to COVID-19 and the accompanying anti-Asian rhetoric. We did not include Asia in our COVID-19 experiment, but other work shows adverse reactions to Asia with COVID-19 (Moran et al., 2021). It will be important to chart how the COVID-19 pandemic affects narratives about Asia and how they compare and/or intersect with those about Africa.

Second, as noted, our results regarding moderators paint a mixed picture. It remains unclear the extent to which racist narratives and their impact are confined to a subset of the population or ingrained in the culture more generally. The fact that results held above and beyond dehumanizing attitudes and symbolic racism suggests to us that these racist narratives are ingrained in culture more generally, at least to some extent. Participants, on average, demonstrated this bias independent of dehumanizing attitudes or symbolic racism. This suggests that many people exhibit this bias without knowledge or racist intent. Of course, it is possible that other individual difference measures could matter. For example, Green and colleagues (2010) find social dominance orientation and belief in a dangerous world mediate the relationship between disease threat and exclusionary immigration attitudes. Thus, more work is needed.

Third, another line of future work is to directly measure the psychological processes (beyond worry) we discussed earlier in the paper. As explained, our study aligns with work on disease avoidance that often points to disgust as a mechanism (e.g., Clifford & Jerit, 2018). Future work could more directly assess disgust and how it varies in response to different groups. A related topic of inquiry concerns antidotes; for example, does the availability of vaccines or other public health interventions (Huang et al. 2011) temper the bias towards Africa as much as it might towards other groups?

Fourth, our results are focused on the international context (i.e., Africa vs. elsewhere). It is unclear how the present results might translate to the domestic context. In another experiment—briefly mentioned above and presented in Supplementary Materials—we do not find that individuals express greater worry about a pandemic and support for travel restrictions for U.S. states with larger Black populations. Our manipulation in that study was subtle, however, and ultimately, the states in question were majority white. It could be that majority Black neighborhoods, cities, and/or counties might elicit greater worry and support for travel restrictions.

Lastly, our study is limited in its ability to identify the origins of racist narratives; for example, it is not clear whether our archival evidence suggests that media play an active role or simply echo norms and narratives circulating in the culture. Future work answering those questions will be vital. For now, the present work suggests that confronting our historical legacy and how it continues to shape, not only minds but, public policies is necessary and urgent as we confront new pandemics.

References

Adams, G., Edkins, V., Lacka, D., Pickett, K. M., & Cheryan, S. (2008). Teaching about racism: Pernicious implications of the standard portrayal. *Basic and Applied Social Psychology, 30,* 349-361. https://doi.org/10.1080/01973530802502309

Aarøe, L., Petersen, M.,B. & ARCENEAUX, K. (2017). The behavioral immune system shapes political intuitions: Why and how individual differences in disgust sensitivity underlie opposition to immigration. *American Political Science Review*, 111(2), 277-294. https://doi.org/10.1017/S0003055416000770

Bonam, C. M., Bergsieker, H. B., & Eberhardt, J. L. (2016). Polluting Black Space. *Journal of Experimental Psychology: General, 145,* 1561-1582. https://doi.org/10.1037/xge0000226

Bonsu, S. K. (2009). Colonial images in global times: Consumer interpretations of Africa and Africans in advertising. *Consumption, Markets and Culture, 12(1)*, 1-25. https://doi.org/10.1080/10253860802560789

Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2011). *Introduction to meta-analysis*. John Wiley & Sons.

Casey, L.S. 2015. Emotions and the politics of Ebola. *PS: Political Science & Politics 48(1),* 7–8.

Chapman, H. A., Johannes, K., Poppenk, J. L., Moscovitch, M., & Anderson, A. K. (2013). Evidence for the differential salience of disgust and fear in episodic memory. *Journal of Experimental Psychology: General, 142(4),* 1100. doi: 10.1037/a0030503

Chinazzi, M., Davis, J. T., Ajelli, M., Gioannini, C., Litvinova, M., Merler, S., et al. (2020). The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak. *Science, 368*, 395-400. doi: 10.1126/science.aba9757

Clifford, S., & Jerit, J. (2018). Disgust, anxiety, and political learning in the face of threat. *American Journal of Political Science, 62,* 266-279. https://doi.org/10.1111/ajps.12350

Cramer, K. (2020). Understanding the role of racism in contemporary US public opinion. *Annual Review of Political Science, 23,* 153-169. https://doi.org/10.1146/annurev-polisci-060418-042842

Davey, G.C.L. (2011). Disgust: the disease-avoidance emotion and its dysfunctions. P*hilosophical Transactions of the Royal Society B, 366,* 3453–3465. https://doi.org/10.1098/rstb.2011.0039

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. Jo*urnal of Personality and Social Psychology, 56(1),* 5-18. https://doi.org/10.1037/0022-3514.56.1.5

Faulkner, J., Schaller, M., Park, J.H, & Duncan, L.A. (2004). Evolved disease-avoidance mechanisms and contemporary xenophobic attitudes. *Groups Processes & Intergroup Relations, 7(4),* 333-353. https://doi.org/10.1177/1368430204046142

Flint, A., & Hewitt, V. (2015). Colonial tropes and HIV/AIDS in Africa: Sex, disease and race. *Commonwealth & Comparative Politics, 53(3)*, 294-314. https://doi.org/10.1080/14662043.2015.1051284

Fredrickson, G. M. (1989). *The arrogance of race: Historical perspectives on slavery, racism, and social inequality*. Wesleyan University Press.

Goff, P. A., Eberhardt, J. L., Williams, M. J., & Jackson, M. C. (2008). Not yet human: Implicit knowledge, historical dehumanization, and contemporary consequences. *Journal of personality and social psychology, 94(2)*, 292. https://doi.org/10.1037/0022-3514.94.2.292

Green, E.G.T., Krings, F., Staerkle, C., Bangerter, A., Clémence, A., Wagner-Egger, P., & Bornand, T. (2010). Keeping the vermin out: Perceived disease threat and ideological orientations as predictors of exclusionary immigration attitudes. *Journal of Community & Applied Social Psychology, 20,* 299-316. https://doi.org/10.1002/casp.1037

Harrison-Chirimuuta, R. J., & Chirimuuta, R. C. (1997). AIDS from Africa: A case of racism vs. science? *AIDS in Africa and the Caribbean*, 165.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach.* New York, NY: Guilford Press.

Henry, P.J., & Sears, D.O. (2002). The symbolic racism 2000 scale. *Political Psychology, 23(2),* 253-283. https://doi.org/10.1111/0162-895X.00281

Hoffman, K. M., Trawalter, S., Axt, J. R., & Oliver, M. N. (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proceedings of the National Academy of Sciences*, *113*(16), 4296-4301. https://doi.org/10.1073/pnas.1516047113

Hong, J.H. (2019). *Opening the gates to Asia: A transpacific history of how American repealed Asican Exclusion*. Chapel Hill, NC: University of North Carolina Press.

Huang, J.Y., Sedlovskaya, A., Ackerman, J.M., & Bargh, J.A. (2011). Immunizing against prejudice: Effects of disease protection on attitudes toward out-groups. *Psychological Science, 22,* 1550-1556. https://doi.org/10.1177/0956797611417261

Hudson, N. (1996). From" Nation to" Race": The Origin of Racial Classification in Eighteenth-Century Thought. *Eighteenth-century Studies, 29,* 247-264. https://www.jstor.org/stable/30053821

Jardina, A., & Piston, S. (2019). Racial Prejudice, Racial Identity, and Attitudes in Political Decision Making." In Oxford Research Encyclopedia of Politics. Oxford University Press. doi: http://dx.doi.org/10.1093/acrefore/9780190228637.013.966

Jardina, A., & Piston, S. (2021). Dehumanizing Attitudes about Black People in American Electoral Politics. *Forthcoming at British Journal of Political Science.*

Jamison D.T., Gelband H., Horton S., Prabhat Jha, P., Laxminarayan, R., Mock, C.N., & Nugent, R., eds. (2017). *Disease control priorities: Improving health and reducing poverty, 3rd edition*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

Jarosz, L. (1992). Constructing the dark continent: Metaphor as geographic representation of Africa. *Geografiska Annaler: Series B, Human Geography, 74,* 105-115.

Kendi, I. X. (2017). *Stamped from the beginning: The definitive history of racist ideas in America.* Random House.

Kiang, L., Huynh, V. W., Cheah, C. S. L., Wang, Y., & Yoshikawa, H. (2017). Moving beyond the model minority. *Asian American Journal of Psychology, 8*(1), 1-6. http://dx.doi.org/10.1037/aap0000070

Kteily, N., Bruneau, E., Waytz, A., & Cotterill, S. (2015). The ascent of man: Theoretical and empirical evidence for blatant dehumanization. *Journal of personality and social psychology*, *109*(5), 901-931. https://doi.org/10.1037/pspp0000048

Kurzban, R., & Leary, M. R. (2001). Evolutionary origins of stigmatization: the functions of social exclusion. *Psychological Bulletin,* 127(2), 187-208. DOI: 10.1037//0033-2909.127.2.187

Leach, C. W. (2002). II. The social psychology of racism reconsidered. *Feminism & Psychology, 12,* 439-444.

Miller, S. L., Maner, J. K., & Becker, D. V. (2010). Self-protective biases in group categorization: Threat cues shape the psychological boundary between "us" and "them". *Journal of Personality and Social Psychology, 99(1),* 62–77. https://doi.org/10.1037/a0018086

Monson, S. (2017). Ebola as African: American media discourses of panic and otherization. *Africa Today, 63(3)*, 3-27. https://doi.org/10.2979/africatoday.63.3.02

Moran, J.B., Goh, J.X., Kerry, N., & Murray, D.R. (2021). Outbreaks and outgroups: Three tests of the relationship between disease avoidance motivates and xenophobia during an emerging pandemic. *Evolutionary Psychological Science,* https://doi.org/10.1007/s40806-021-00283-z

Murdocca, C. (2003). When Ebola came to Canada: Race and the making of the respectable body. *Atlantis: Critical Studies in Gender, Culture & Social Justice, 27(2)*, 24-31.

Oguh, C. (2015). Representation of Africa in Western Media: Still A 21st century Problem. PhD diss., Edinburgh Napier University.

Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). Linguistic inquiry and word count: LIWC 2001. Mahway: Lawrence Erlbaum Associates.

Petersen, M. B. (2017). Healthy out-group members are represented psychologically as infected in-group members. *Psychological Science*, *28*(12), 1857–1863. https://doi.org/10.1177/0956797617728270

Petersen, M. B. (2019). How and why disgust responses underlie prejudice. *Politics and the Life Sciences, 38,* 62-71. https://doi.org/10.1017/pls.2018.23

Pilling, D. (2020, October 22). How Africa fought the pandemic — and what coronavirus has taught the world. *Financial Times*. Retrieved at https://www.ft.com/content/c0badd91-a395-4644-a734-316e71d60bf7

Salter, P., & Adams, G. (2013). Toward a critical race psychology. *Social and Personality Psychology Compass, 7,* 781-793. https://doi.org/10.1111/spc3.12068

Savage, R. (2007). “Disease incarnate”: biopolitical discourse and genocidal dehumanization in the age of modernity. *Journal of Historical Sociology, 20,* 404-440. https://doi.org/10.1111/j.1467-6443.2007.00315.x

Schaller, M., & Duncan, L. A. (2007). The behavioural immune system: Its evolution and social psychological implications. In J. P. Forgas, M. G. Haselton, & W. von Hippel (Eds.), *Evolution and the social mind: Evolutionary psychology and social cognition* (pp. 293–307). New York: Psychology Press.

Schaller, M., & Neuberg, S.L. Danger, disease, and the nature of prejudice(s). (2012). *Advances in Experimental Social Psychology*, *46,* 10.1016/B978-0-12-394281-4.00001-5.

Schaller, M., & Park, J. H. (2011). The behavioral immune system (and why it matters). *Current directions in psychological science, 20(2),* 99-103. https://doi.org/10.1177/0963721411402596

Schaller, M., Park, J., & Faulkner, J. (2003). Prehistoric dangers and contemporary prejudices. *European review of social psychology, 14(1),* 105-137. https://doi.org/10.1080/10463280340000036

Seay, L., & Dionne, K. Y. (2014, August 25). The long and ugly tradition of treating Africa as a dirty, diseased place. *The Washington Post*. Retrieved at https://www.washingtonpost.com/news/monkey-cage/wp/2014/08/25/othering-ebola-and-the-history-and-politics-of-pointing-at-immigrants-as-potential-disease-vectors/

Smedley, A., & Smedley, B. D. (2005). Race as biology is fiction, racism as a social problem is real: Anthropological and historical perspectives on the social construction of race. *American psychologist, 60(1)*, 16. https://doi.org/10.1037/0003-066X.60.1.16

Soy, A. (2020, October 7). Coronavirus in Africa: Five reasons why COVID-19 has been less deadly than elsewhere. *BBC News*. Retrieved at: https://www.bbc.com/news/world-africa 54418613

Strohminger, N. (2014). Disgust talked about. *Philosophy Compass, 9(7),* 478-493. https://doi.org/10.1111/phc3.12137

Taylor, K. (2007). Disgust is a factor in extreme prejudice. *British Journal of Social Psychology, 46(3),* 597-617. https://doi.org/10.1348/014466606X156546

Tileagă, C. (2018). Extending the social psychology of racism and moral exclusion: a framework for critical analysis. In P.L. Hammack (Ed.), *The Oxford Handbook of Social Psychology and Social Justice,* Oxford University Press.

Vaughan, M. (1991). *Curing their ills: Colonial power and African illness*. Stanford University Press.

Wang, I. W., Michalak, N. M., & Ackerman, J. M. (2018). Threat of infectious disease. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *The SAGE handbook of personality and individual differences* (pp. 321-345). Thousand Oaks, CA: SAGE.

Williams, M. J., & Eberhardt, J. L. (2008). Biological conceptions of race and the motivation to cross racial boundaries. *Journal of personality and social psychology*, *94*(6), 1033. https://doi.org/10.1037/0022-3514.94.6.1033

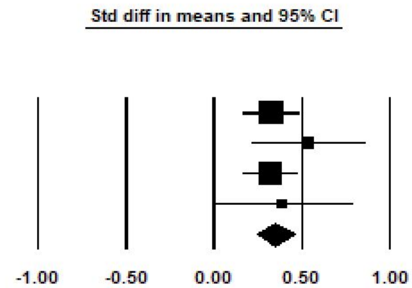
Xu, M., Ding, C., Li, Z., Zhang, J., Zeng, Q., Diao, L., et al. (2016). The divergent effects of fear and disgust on unconscious inhibitory control. *Cognition and emotion, 30(4),* 731-744. https://doi.org/10.1080/02699931.2015.1027664

Table 1

Meta-analysis of condition effects on worry, support for a travel ban and loosening abortion restrictions.

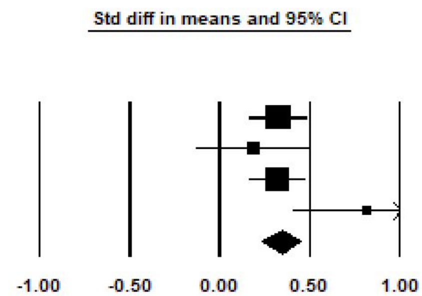
(A) Worry

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Experiment 1	0.322	0.083	0.007	0.160	0.485	3.892	0.000
Experiment 2	0.536	0.165	0.027	0.212	0.860	3.243	0.001
Experiment 3	0.320	0.082	0.007	0.159	0.481	3.892	0.000
Experiment 4	0.387	0.204	0.042	-0.014	0.787	1.892	0.058
	0.348	0.053	0.003	0.244	0.452	6.546	0.000



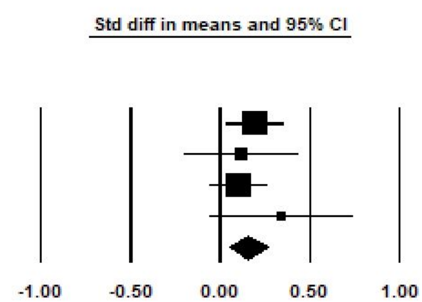
(B) Travel Ban

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Experiment 1	0.322	0.083	0.007	0.160	0.485	3.892	0.000
Experiment 2	0.187	0.163	0.027	-0.133	0.507	1.147	0.252
Experiment 3	0.320	0.082	0.007	0.159	0.481	3.892	0.000
Experiment 4	0.816	0.209	0.044	0.406	1.226	3.898	0.000
	0.339	0.053	0.003	0.235	0.443	6.375	0.000



(C) Loosening Abortion Restrictions

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Experiment 1	0.194	0.083	0.007	0.032	0.356	2.348	0.019
Experiment 2	0.116	0.163	0.027	-0.204	0.435	0.710	0.477
Experiment 3	0.099	0.082	0.007	-0.062	0.259	1.207	0.227
Experiment 4	0.341	0.204	0.042	-0.059	0.741	1.669	0.095
	0.156	0.053	0.003	0.052	0.259	2.947	0.003



Notes: These are forest plots for the three meta-analyses. The lines and boxes reflect effect sizes and 95% confidence intervals, respectively, for each study; the diamond represents the overall estimate of the effect size. The mass of the effect-size boxes reflects the relative weights of the studies in the meta-analysis (study weight was determined by the standard error of the observed mean difference). Positive effect sizes reflect increased worry (Panel A), support for a travel ban (Panel B) and loosening abortion restrictions (Panel C).

Table 2

Descriptive Statistics for the Archival Study

Variable	Mean	Std. Dev.	Min	Max
Africa mentioned (0 vs. 1)	.19	.39	0	1
Africa mentioned (sum)	.28	.73	0	8
Word count	726.01	543.58	30	9,076
Personal pronoun use	2.29	1.74	0	10.86
Risk words	1.09	.68	0	5.00
Death words	.25	.40	0	3.60
Emotional tone	20.71	15.28	1	88.65

Table 3

Test Statistics for the Archival Study Regression Analyses

Model (outcome and predictor)	*B*	*t*	*P*	η^2	95% CI
Tone					
Africa mentioned (0 vs. 1)	-1.88	-1.80	.072	.002	[.000, .010]
Africa mentioned (sum of mentions)	-1.81	-3.26	.001	.007	[.001, .018]
Death-related words					
Africa mentioned (0 vs. 1)	.11	4.19	<.0001	.012	[.003, .025]
Africa mentioned (sum of mentions)	.06	4.06	<.0001	.011	[.003, .024]
Risk-related words					
Africa mentioned (0 vs. 1)	.004	.09	.931	.0001	[.000, .001]
Africa mentioned (sum of mentions)	.03	1.27	.205	.0011	[.000, .007]
Personal pronouns					
Africa mentioned (0 vs. 1)	-.32	-2.74	.006	.005	[.0003, .014]
Africa mentioned (sum of mentions)	-.18	-2.88	.004	.005	[.0005, .015]

Supplemental Information

2

The New York Times

GLOBAL HEALTH

Andromeda Virus Is Spreading in Africa, Experts (Quietly) Warn

Doctors attended to a A7N4 Andromeda Virus patient in Kumasi, Ghana, in February. The country has been experiencing a "fifth wave" of flu since October 2016.

Nov. 17, 2017

While trying to avoid alarmism, global health agencies are steadily ratcheting up concern about the Andromeda Virus that has developed in Africa. Viruses that can infect humans — particularly those of the A7N4 strain — continue to spread to new cities there.

Since October 2016, Ghana has seen a steep increase in A7N4 infections. Nearly 1,600 people have tested positive, almost 40 percent of whom have died. A small number of clusters suggest that the virus could be passing from person to person but the exact cause of transmission is yet to be known.

In September, the Centers for Disease Control and Prevention summarized some disturbing developments. The A7N4 had become lethal to birds, which made it potentially more dangerous to people but also easier to spot. The virus had also split into two lineages, complicating efforts to make vaccines.

In October, a prominent team of virologists showed that a Ghanaian A7N4 strain could be transmitted between humans. The development was "not good for public health," said the team. Shortly after this finding, the World Health Organization put out an update citing new cases of A7N4 infection passed from pregnant woman to fetus. Infection during pregnancy could cause severe fetal defects. Further analysis is needed to determine the full range of effects the virus has on both mother and fetus.

Many microbiologists consider influenza, a prominent virus, to be the virus most likely to start a pandemic that kills millions. Like many flu strains, the Andromeda virus has been unpredictable.

Public health experts have become wary about raising alarms over this viral outbreak due to the fallout over the overblown predictions made in 2005 and 2009 about the avian and swine flu. In both these years, drastic measures were taken to prevent the mutation and spread of the viruses among humans.

These viruses were active on a global scale and are currently still active but so far has not become a human epidemic. As for this novel virus, officials are still investigating ways to combat its spread and to develop a vaccine.

The New York Times

GLOBAL HEALTH

Andromeda Virus Is Spreading in Asia, Experts (Quietly) Warn

Doctors attended to a A7N4 Andromeda Virus patient in Wuhan, China, in February. The country has been experiencing a "fifth wave" of flu since October 2016.

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3

The New York Times

GLOBAL HEALTH

Andromeda Virus Is Spreading in Europe, Experts (Quietly) Warn

Doctors attended to a A7N4 Andromeda Virus patient in Hamburg, Germany, in February. The country has been experiencing a "fifth wave" of flu since October 2016.

Nov. 17, 2017

While trying to avoid alarmism, global health agencies are steadily ratcheting up concern about the Andromeda Virus that has developed in Europe. Viruses that can infect humans — particularly those of the A7N4 strain — continue to spread to new cities there.

Since October 2016, Germany has seen a steep increase in A7N4 infections. Nearly 1,600 people have tested positive, almost 40 percent of whom have died. A small number of clusters suggest that the virus could be passing from person to person but the exact cause of transmission is yet to be known.

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The New York Times

GLOBAL HEALTH

Andromeda Virus Is Spreading in South America, Experts (Quietly) Warn

Doctors attended to a A7N4 Andromeda Virus patient in Brasilia, Brazil, in February. The country has been experiencing a "fifth wave" of flu since October 2016.

Nov. 17, 2017

While trying to avoid alarmism, global health agencies are steadily ratcheting up concern about the Andromeda Virus that has developed in South America. Viruses that can infect humans — particularly those of the A7N4 strain — continue to spread to new cities there.

Since October 2016, Brazil has seen a steep increase in A7N4 infections. Nearly 1,600 people have tested positive, almost 40 percent of whom have died. A small number of clusters suggest that the virus could be passing from person to person but the exact cause of transmission is yet to be known.

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4

The New York Times

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Zuska's Disease Grew Deadlier With a Small Mutation, Study Suggests

Pedro Miguel Rivera-Gonzalez, a young Mexican child affected by Zuska's Disease, being comforted by his mother, Paola. Scientists believe the deadly strain of the disease which causes facial and brain damage, might be traced to a single genetic mutation that arose in the disease in 2013.

Sept. 28, 2017

It remains one of the great mysteries of the Zuska epidemic: Why did a virus that existed for decades elsewhere in the world suddenly seem to become more destructive when it landed in Latin America?

Why did Zuska's Disease cause thousands of babies to be born with unusually small and damaged brains and disfigured faces, leaving those infected unable to speak or eat normally, when previous outbreaks seemed to cause much less harm?

An intriguing study in mice, which has prompted some skepticism among experts, suggests that a single genetic mutation helped transform the Zuska's Disease into a devastating force in Mexico. The report was published on Thursday in the journal Science.

The mutation, called S122N, is a strain of Zuska's Disease that arose in Mexico in 2013, just before a small outbreak in other parts of the world.

Zuska's Disease is believed to have first appeared in Mexico later in 2013.This mutation has appeared in every strain of the virus in the Asian outbreak, the researchers said.

The study, by scientists, found that strains of Zuska's Disease with the S122N mutation caused substantially more death and life-altering facial disfigurement in mice than other strains. And in a laboratory dish, the S122N strain killed many more human cells important to early brain development than an earlier strain without the mutation.

Some experts voiced doubts, saying the findings were too preliminary to establish that a single mutation was the critical factor. At least, they said (and the study authors agree), the results must be replicated in primates, because laboratory experiments with mice and even human brain cells cannot fully capture how the virus functions in nature.

The authors and other experts said they did not know why the mutation might have such a profound effect.

The cases of the swift progression of the disease, disfigurement of the child's face that prevents them from speaking or eating normally, were heavily concentrated in Mexico, for example, but the mutated Zuska strain was found everywhere.

A version of this article appears in print on Sept. 29, 2017, on Page A9 of the New York edition with the headline: Zika Virus Grew Deadlier With Mutation, Study Suggests. Order Reprints | Today's Paper | Subscribe

The New York Times

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Zuska's Disease Grew Deadlier With a Small Mutation, Study Suggests

Marcel Alexandre, a young French child affected by Zuska's Disease, receiving a kiss from his mother, Michelle. Scientists believe the deadly strain of the disease which causes facial and brain damage, might be traced to a single genetic mutation that arose in the disease in 2013.

Sept. 28, 2017

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The New York Times

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Zuska's Disease Grew Deadlier With a Small Mutation, Study Suggests

Nonso Amadi, a young Nigerian child affected by Zuska's Disease, receiving a kiss from his mother, Chioma. Scientists believe the deadly strain of the disease which causes facial and brain damage, might be traced to a single genetic mutation that arose in the disease in 2013.

Sept. 28, 2017

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The New York Times

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Zuska's Disease Grew Deadlier With a Small Mutation, Study Suggests

Bao Nguyen, a young Vietnamese child affected by Zuska's Disease, being comforted by his mother, An. Scientists believe the deadly strain of the disease which causes facial and brain damage, might be traced to a single genetic mutation that arose in the disease in 2013.

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Additional results for Experiment 2

In Experiment 2, we explored whether individual differences (i.e., biological beliefs about race and dehumanization) moderate the effect of condition on dependent measures. For biological beliefs, we asked participants whether 15 statements about biological differences between Black people and White people were definitely false to definitely true (Hoffman et al., 2016; e.g., “Black people’s nerve-endings are less sensitive than White people’s nerve-endings.” “Blacks have a more sensitive sense of smell than Whites; they can differentiate odors and detect faint smells better than Whites.” “Black couples are significantly more fertile than White couples.” “Whites are less likely to have a stroke than Blacks. Whites have more efficient respiratory systems than Blacks”). We also asked participants questions about the extent to which race is a biological vs. social function (Williams & Eberhardt, 2008; e.g., “Racial groups are primarily determined by biology.” “It’s easy to tell what race people are by looking at them.” “How a person is defined racially depends on the social context.” “People who are of different races may look quite similar to each other.”). For dehumanization, we used the explicit infra-humanization scale developed by Kteily and colleagues (2015), where participants are asked to indicate the extent to which different groups including Whites and Blacks are fully evolved, using a slider from 0% to 100%. These measures were included as exploratory variables.

We explored whether individual differences (i.e., biological beliefs about race and dehumanization) moderate the effect of condition on dependent measures. We operationalize biological beliefs in 3 ways. First, we average participants’ ratings to the Hoffman et al. questions. As noted in the manuscript, this variable predicts worry, but not policy support.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	16.3843529	1.8204837	3.26	0.0011
Error	179	100.0286395	0.5588192		
Corrected Total	188	116.4129924			

R-Square	Coeff Var	Root MSE	worry Mean
0.140743	59.44690	0.747542	1.257496

Source	DF	Type III SS	Mean Square	F Value	Pr > F
ideology	1	0.98236692	0.98236692	1.76	0.1866
white	1	2.01515471	2.01515471	3.61	0.0592
condition	3	1.54282206	0.51427402	0.92	0.4322
biodiff	1	2.60164631	2.60164631	4.66	0.0323*
biodiff*condition	3	1.39220473	0.46406824	0.83	0.4787

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.41497725	0.04610858	1.01	0.4322
Error	179	8.15645132	0.04556677		
Corrected Total	188	8.57142857			

R-Square	Coeff Var	Root MSE	ban Mean
0.048414	448.2738	0.213464	0.047619

Source	DF	Type III SS	Mean Square	F Value	Pr > F

white	1	0.09627840	0.09627840	2.11	0.1478
ideology	1	0.00021762	0.00021762	0.00	0.9450
condition	3	0.12190781	0.04063594	0.89	0.4466
biodiff	1	0.01028067	0.01028067	0.23	0.6354
biodiff*condition	3	0.18168597	0.06056199	1.33	0.2664

Dependent Variable: abortion

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	6.47800590	0.71977843	3.70	0.0003
Error	179	34.83416341	0.19460426		
Corrected Total	188	41.31216931			

R-Square	Coeff Var	Root MSE	abortion Mean
0.156806	65.13704	0.441140	0.677249

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.01728552	0.01728552	0.09	0.7660
ideology	1	5.10366591	5.10366591	26.23	<.0001
condition	3	0.37741238	0.12580413	0.65	0.5861
biodiff	1	0.06048906	0.06048906	0.31	0.5779
biodiff*condition	3	0.39651699	0.13217233	0.68	0.5659

Second, we examined how many of the Hoffman et al. (2016) questions participants endorsed (i.e., rated as possibly, probably, or definitely true as opposed to false), and tested if that variable moderates the effect of condition on our dependent variables. Again, we find that this variable predicts worry, but not support for travel bans or loosening abortion restrictions.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	15.8989435	1.7665493	3.15	0.0015
Error	179	100.5140488	0.5615310		
Corrected Total	188	116.4129924			

R-Square	Coeff Var	Root MSE	worry Mean
0.136574	59.59096	0.749354	1.257496

Source	DF	Type III SS	Mean Square	F Value	Pr > F
ideology	1	0.78519920	0.78519920	1.40	0.2386
white	1	2.33812963	2.33812963	4.16	0.0428
condition	3	3.55815822	1.18605274	2.11	0.1003
biodiff1	1	2.11906798	2.11906798	3.77	0.0536
biodiff1*condition	3	1.11610772	0.37203591	0.66	0.5761

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.27360759	0.03040084	0.66	0.7479
Error	179	8.29782098	0.04635654		
Corrected Total	188	8.57142857			

R-Square	Coeff Var	Root MSE	ban Mean
0.031921	452.1420	0.215306	0.047619

Source	DF	Type III SS	Mean Square	F Value	Pr > F

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.13354922	0.13354922	2.88	0.0914
ideology	1	0.00395821	0.00395821	0.09	0.7705
condition	3	0.04053863	0.01351288	0.29	0.8315
biodiff1	1	0.03800910	0.03800910	0.82	0.3664
biodiff1*condition	3	0.04098492	0.01366164	0.29	0.8292

Dependent Variable: abortion

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	6.15706190	0.68411799	3.48	0.0005
Error	179	35.15510741	0.19639725		
Corrected Total	188	41.31216931			

R-Square	Coeff Var	Root MSE	abortion Mean
0.149037	65.43642	0.443167	0.677249

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.02086826	0.02086826	0.11	0.7448
ideology	1	5.03433257	5.03433257	25.63	<.0001
condition	3	0.30939154	0.10313051	0.53	0.6656
biodiff1	1	0.00521335	0.00521335	0.03	0.8708
biodiff1*condition	3	0.16013281	0.05337760	0.27	0.8457

Third, we create a composite for items measuring participants' perceptions of race as a biological vs. social construct, developed by Williams and Eberhardt (2008). We find that this variable does not predict our dependent variables, and does not moderate the effect of condition.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	13.5325643	1.5036183	2.62	0.0073
Error	179	102.8804281	0.5747510		
Corrected Total	188	116.4129924			

R-Square	Coeff Var	Root MSE	worry Mean
0.116246	60.28835	0.758123	1.257496

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	2.51388972	2.51388972	4.37	0.0379
ideology	1	1.17583297	1.17583297	2.05	0.1544
condition	3	7.62370085	2.54123362	4.42	0.0050
biosoc	1	0.11079870	0.11079870	0.19	0.6611
biosoc*condition	3	1.29759442	0.43253147	0.75	0.5222

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.33364506	0.03707167	0.81	0.6117
Error	179	8.23778351	0.04602114		
Corrected Total	188	8.57142857			

R-Square	Coeff Var	Root MSE	ban Mean
0.038925	450.5033	0.214525	0.047619

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.11261627	0.11261627	2.45	0.1195

ideology	1	0.00072226	0.00072226	0.02	0.9004
condition	3	0.05038471	0.01679490	0.36	0.7784
biosoc	1	0.09926929	0.09926929	2.16	0.1437
biosoc*condition	3	0.01963745	0.00654582	0.14	0.9345

Dependent Variable: abortion

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	7.08214135	0.78690459	4.11	<.0001
Error	179	34.23002796	0.19122921		
Corrected Total	188	41.31216931			

R-Square	Coeff Var	Root MSE	abortion Mean
0.171430	64.56973	0.437298	0.677249

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.02282267	0.02282267	0.12	0.7301
ideology	1	4.49600751	4.49600751	23.51	<.0001
condition	3	0.44865819	0.14955273	0.78	0.5054
biosoc	1	0.07960113	0.07960113	0.42	0.5196
biosoc*condition	3	1.01814571	0.33938190	1.77	0.1536

Lastly, we examine dehumanization. We operationalize dehumanization in 2 ways. The first way is to use a difference score between participants' humanization ratings of "Whites" and "Blacks." We find that dehumanization, defined in this way, moderates the effect of condition on support for travel bans, but not worry or support for loosening abortion restrictions, as reported in the manuscript.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	15.0324539	1.6702727	2.92	0.0030
Error	175	100.1393179	0.5722247		
Corrected Total	184	115.1717718			

R-Square	Coeff Var	Root MSE	worry Mean
0.130522	60.36416	0.756455	1.253153

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	2.26457536	2.26457536	3.96	0.0482
ideology	1	1.05298343	1.05298343	1.84	0.1767
condition	3	7.32721562	2.44240521	4.27	0.0062
humd	1	1.38426906	1.38426906	2.42	0.1217
humd*condition	3	1.92202022	0.64067341	1.12	0.3426

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.89600203	0.09955578	2.27	0.0197
Error	175	7.66616013	0.04380663		
Corrected Total	184	8.56216216			

R-Square	Coeff Var	Root MSE	ban Mean
0.104647	430.2285	0.209300	0.048649

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.15720855	0.15720855	3.59	0.0598
ideology	1	0.00362738	0.00362738	0.08	0.7739

condition	3	0.05521568	0.01840523	0.42	0.7388
humd	1	0.07612152	0.07612152	1.74	0.1892
humd*condition	3	0.52966507	0.17655502	4.03	0.0084

Dependent Variable: abortion

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	5.60605440	0.62289493	3.19	0.0014
Error	175	34.21016182	0.19548664		
Corrected Total	184	39.81621622			

R-Square	Coeff Var	Root MSE	abortion Mean
0.140798	64.40603	0.442139	0.686486

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.00168410	0.00168410	0.01	0.9262
ideology	1	5.17523719	5.17523719	26.47	<.0001
condition	3	0.36029925	0.12009975	0.61	0.6066
humd	1	0.00393376	0.00393376	0.02	0.8874
humd*condition	3	0.05209912	0.01736637	0.09	0.9661

The second way is to use a participants' humanization ratings of "Blacks." We find that dehumanization, defined in this way, moderates the effect of condition on support for travel bans, but not worry or support for loosening abortion restrictions, similar to the effect above, reported in the manuscript.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	14.1768448	1.5752050	2.73	0.0053
Error	175	100.9949270	0.5771139		
Corrected Total	184	115.1717718			

R-Square	Coeff Var	Root MSE	worry Mean
0.123093	60.62149	0.759680	1.253153

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	2.57351387	2.57351387	4.46	0.0361
ideology	1	1.67220765	1.67220765	2.90	0.0905
condition	3	2.54507188	0.84835729	1.47	0.2244
hum_black	1	0.00460932	0.00460932	0.01	0.9289
hum_black*condition	3	2.69100953	0.89700318	1.55	0.2023

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.69023704	0.07669300	1.70	0.0910
Error	175	7.87192513	0.04498243		
Corrected Total	184	8.56216216			

R-Square	Coeff Var	Root MSE	ban Mean
0.080615	435.9640	0.212091	0.048649

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.13303140	0.13303140	2.96	0.0873
ideology	1	0.02305362	0.02305362	0.51	0.4750
condition	3	0.46037916	0.15345972	3.41	0.0188

hum_black	1	0.00476612	0.00476612	0.11	0.7452
hum_black*condition	3	0.41329350	0.13776450	3.06	0.0296

Dependent Variable: abortion

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	6.02223763	0.66913751	3.47	0.0006
Error	175	33.79397858	0.19310845		
Corrected Total	184	39.81621622			

R-Square	Coeff Var	Root MSE	abortion Mean
0.151251	64.01307	0.439441	0.686486

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.01088714	0.01088714	0.06	0.8126
ideology	1	4.75564583	4.75564583	24.63	<.0001
condition	3	0.10925552	0.03641851	0.19	0.9041
hum_black	1	0.24697245	0.24697245	1.28	0.2596
hum_black*condition	3	0.09086476	0.03028825	0.16	0.9252

In sum, moderation effects were spotty. Beliefs in biological differences between Blacks and Whites (Hoffman et al., 2016) were a significant predictor of worry, irrespective of condition, F (1, 179) = 4.66, p = .032, η2 = .012, 95% CI = [.000, .045]. Those who endorsed more biological beliefs were more worried about the disease. In addition, dehumanization (a difference score of dehumanization of Black vs. White targets; Kteily et al., 2015) moderated the effect of condition on support for a travel ban, F (1, 175) = 4.03, p = .008, η2 = 062, 95% CI = [.004, .128]. Follow-up analyses revealed that dehumanization predicted support for a travel ban only in the Nigeria condition, F (1, 147) = 11.02, p = .002; participants who dehumanized Black people more were more likely to support a travel ban for Nigeria. In all other conditions, dehumanization did not predict support for a travel ban, all Fs < 1. In short, biological beliefs about race predicted worry across conditions and dehumanization of Black people predicted support for a travel ban in the Nigeria but not in the other conditions. None of our individual difference variables predicted support for loosening restrictions on abortion in the Nigeria condition or any other condition. Moreover, political ideology did not moderate our effects. Although spotty, these results are generally consistent with the notion that racist ideas—specifically, biological beliefs about race and the belief that Black people are less human—shape perceptions of and reactions to disease.

Demographics for "Relevance to COVID-19" experiment

The below tables report demographics versus census benchmarks for the "Relevance to COVID-19" experiment. These come from the experiment described in the main text as well as the "national context" experiment described below. (Percentages do not always sum to 100% due to rounding errors.) The experimental data matches the benchmarks well with the main discrepancy being an under-representation of those with no high school degree and over-representation of those with an Associate's degree or some college. We also somewhat under-represent higher income individuals.

Age

Age Category	Our Sample (%)	Census Benchmark
18-24	14.0	12.1
25-34	18.8	17.9
35-50	26.3	24.5
51-65	25.2	24.9
Over 65	15.8	20.7

Gender Identity

Gender Identity	Our Sample (%)	Census Benchmark
Female	50.8	50.8
Male	48.2	49.2
Transgender/None	1	--*

*The U.S. Census Bureau does not currently ask about transgender identity, so there is no government-provided benchmark for that quantity. Flores et al. (2016) estimate that less than 1 percent of Americans identify as transgender, consistent with our estimates here.

Education Level

Educational Attainment	Our Sample (%)	Census Benchmark (%)
Did not complete high school	2.6	12
High school graduate	23.2	27.1
Associates Degree/Some College	39	28.9
Bachelor's Degree	24.9	19.7
Advanced Degree	10.2	12.3

Annual Family Income before Taxes

Income Category	Our Sample (%)	Census Benchmark (%)*
$30,000 or less	29.4	29.4
$30,000 - $69,999	38.4	30.3
$70,000 - $99,999	16.7	12.5
$100,000 - $200,000	13	20.9
Above $200,000	2.5	6.9

*The Census categories for income are slightly different than the ones we use. They record income as: $34,999 or below, $35,000 - $74,999, $75,000 - $99,999, $100,000 - $199,999, and $200,000 or greater.

Primary Racial Group

Primary Race	Our Sample (%)	Census Benchmark
Caucasian (White)	72.5	72.2
African-American	14.2	12.7
Hispanic or Latino	15.1	18.3
Asian-American	6.9	5.6
Native American	3	< 1
Other	1.7	5

Additional results for "Relevance to COVID-19" Experiment: Individual Differences

In this study, we used 5 items from the biological beliefs scale used in Experiment 2 (Hoffman et al., 2016; i.e., "Black people's nerve-endings are less sensitive than White people's nerve-endings." "Blacks have a more sensitive sense of smell than Whites; they can differentiate odors and detect faint smells better than Whites." "Black couples are significantly more fertile than White couples." "Whites are less likely to have a stroke than Blacks. Whites have more efficient respiratory systems than Blacks"), the dehumanization scale used in Experiment 2 (Kteily et al., 2015), and 4 items from the Symbolic Racism scale (Henry & Sears, 2002; i.e., "Irish, Italians, Jewish and many other minorities overcame prejudice and worked their way up. Blacks should do the same without any special favors." "It's really a matter of some people not trying hard enough. If blacks would only try harder, they could be just as well off as whites." "Generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class." "Over the past few years, blacks have gotten less than they deserve."). They answered the latter on 5-point scales with anchors ranging from Strongly Disagree to Strongly Agree.

We conducted a series of exploratory analyses, to test whether individual differences (i.e., biological beliefs about race, dehumanization, and symbolic racism) moderate the effect of condition on our three dependent measures. We operationalize biological beliefs in 2 ways. First, we average participants' ratings to the Hoffman et al. (2016) questions. We find that this variable predicts worry, but not support for travel bans or loosening abortion restrictions.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	77.6481181	8.6275687	13.18	<.0001
Error	1188	777.4845103	0.6544482		
Corrected Total	1197	855.1326285			

R-Square	Coeff Var	Root MSE	worry Mean
0.090802	27.95647	0.808980	2.893712

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	6.88377821	6.88377821	10.52	0.0012
ideology	1	27.30922379	27.30922379	41.73	<.0001
covidrate	1	9.33570233	9.33570233	14.26	0.0002
country	1	0.45370975	0.45370975	0.69	0.4052
country*covidrate	1	0.16115102	0.16115102	0.25	0.6198
biobeliefs	1	2.93679817	2.93679817	4.49	0.0344*
biobeliefs*covidrate	1	2.19622675	2.19622675	3.36	0.0672
biobeliefs*country	1	1.30206378	1.30206378	1.99	0.1586
biobel*country*covidra	1	0.07791111	0.07791111	0.12	0.7301

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	44.9566459	4.9951829	6.34	<.0001
Error	1188	935.7612172	0.7876778		
Corrected Total	1197	980.7178631			

R-Square	Coeff Var	Root MSE	ban Mean
0.045841	31.68175	0.887512	2.801336

Source	DF	Type III SS	Mean Square	F Value	Pr > F

white	1	0.47000605	0.47000605	0.60	0.4400
ideology	1	0.83219974	0.83219974	1.06	0.3042
covidrate	1	4.39414316	4.39414316	5.58	0.0183
country	1	2.79412212	2.79412212	3.55	0.0599
country*covidrate	1	0.83071579	0.83071579	1.05	0.3047
biobeliefs	1	3.24141532	3.24141532	4.12	0.0427*
biobeliefs*covidrate	1	0.00911579	0.00911579	0.01	0.9143
biobeliefs*country	1	0.00247610	0.00247610	0.00	0.9553
biobel*country*covidra	1	0.16098571	0.16098571	0.20	0.6513

Second, we examine how many of the Hoffman et al. questions participants endorsed (i.e., rated as possibly, probably, or definitely true as opposed to false), and test if that variable moderates the effect of condition on our dependent variables. We find that this variable predicts worry, but not support for travel bans or loosening abortion restrictions; and moderates the effect of country and COVID-19 rate conditions, as reported in the manuscript.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	78.4165750	8.7129528	13.33	<.0001
Error	1188	776.7160535	0.6538014		
Corrected Total	1197	855.1326285			

R-Square	Coeff Var	Root MSE	worry Mean
0.091701	27.94265	0.808580	2.893712

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	6.73389545	6.73389545	10.30	0.0014
ideology	1	26.71861491	26.71861491	40.87	<.0001
covidrate	1	16.95440418	16.95440418	25.93	<.0001
country	1	5.77614912	5.77614912	8.83	0.0030
country*covidrate	1	1.34915667	1.34915667	2.06	0.1511
biobeliefs1	1	2.54499776	2.54499776	3.89	0.0487*
biobeliefs*covidrate	1	2.50436372	2.50436372	3.83	0.0506~
biobeliefs1*country	1	2.46000313	2.46000313	3.76	0.0526~
biobel*country*covidra	1	0.01337495	0.01337495	0.02	0.8863

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	45.1535899	5.0170655	6.37	<.0001
Error	1188	935.5642732	0.7875120		
Corrected Total	1197	980.7178631			

R-Square	Coeff Var	Root MSE	ban Mean
0.046041	31.67842	0.887419	2.801336

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.47480387	0.47480387	0.60	0.4376
ideology	1	0.64692167	0.64692167	0.82	0.3649
covidrate	1	18.79843696	18.79843696	23.87	<.0001
country	1	11.99622649	11.99622649	15.23	0.0001
country*covidrate	1	2.50261637	2.50261637	3.18	0.0749~
biobeliefs1	1	2.34611552	2.34611552	2.98	0.0846~
biobeliefs*covidrate	1	0.13888650	0.13888650	0.18	0.6746
biobeliefs1*country	1	0.13871175	0.13871175	0.18	0.6748
biobel*country*covidra	1	1.02253009	1.02253009	1.30	0.2547

Next, we examine dehumanization. We operationalize dehumanization in 2 ways. The first way is to use a difference score between participants' humanization ratings of "Whites" and "Blacks." We find that dehumanization, defined in this way, moderates the interaction between country and COVID-19 rate, as reported in the manuscript.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	73.2060145	8.1340016	12.38	<.0001
Error	1167	766.9631538	0.6572092		
Corrected Total	1176	840.1691683			

R-Square	Coeff Var	Root MSE	worry Mean
0.087132	28.01455	0.810684	2.893798

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	7.78002508	7.78002508	11.84	0.0006
ideology	1	26.70195447	26.70195447	40.63	<.0001
covidrate	1	13.50333787	13.50333787	20.55	<.0001
country	1	15.21595540	15.21595540	23.15	<.0001
country*covidrate	1	1.84811700	1.84811700	2.81	0.0938
dehum	1	1.15923836	1.15923836	1.76	0.1844
dehum*covidrate	1	0.00094549	0.00094549	0.00	0.9698
dehum*country	1	0.46251729	0.46251729	0.70	0.4017
dehum*country*covidrat	1	2.80063276	2.80063276	4.26	0.0392*

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	48.6381482	5.4042387	6.85	<.0001
Error	1167	920.6396768	0.7888943		
Corrected Total	1176	969.2778250			

R-Square	Coeff Var	Root MSE	ban Mean
0.050180	31.73674	0.888197	2.798641

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.42399099	0.42399099	0.54	0.4636
ideology	1	0.59223593	0.59223593	0.75	0.3864
covidrate	1	21.14366553	21.14366553	26.80	<.0001
country	1	15.94448363	15.94448363	20.21	<.0001
country*covidrate	1	1.70218045	1.70218045	2.16	0.1421
dehum	1	0.19810797	0.19810797	0.25	0.6164
dehum*covidrate	1	2.63070381	2.63070381	3.33	0.0681
dehum*country	1	0.11273066	0.11273066	0.14	0.7055
dehum*country*covidrat	1	5.20619082	5.20619082	6.60	0.0103*

The second way is to use a participants' humanization ratings of "Blacks." We find that dehumanization, defined in this way, predicts worry and support for travel bans.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	75.4112572	8.3790286	12.83	<.0001
Error	1174	766.8526317	0.6531964		
Corrected Total	1183	842.2638889			

R-Square	Coeff Var	Root MSE	worry Mean
0.089534	27.90926	0.808206	2.895833

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	7.93253912	7.93253912	12.14	0.0005
ideology	1	26.44103297	26.44103297	40.48	<.0001
covidrate	1	0.31651572	0.31651572	0.48	0.4865
country	1	0.27116053	0.27116053	0.42	0.5195
country*covidrate	1	0.05236564	0.05236564	0.08	0.7771
humafam	1	4.22694903	4.22694903	6.47	0.0111*
humafam*covidrate	1	1.97226627	1.97226627	3.02	0.0825
humafam*country	1	0.09716610	0.09716610	0.15	0.6998
humafa*country*covidra	1	0.29076152	0.29076152	0.45	0.5048

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	45.6108546	5.0678727	6.43	<.0001
Error	1174	925.3486049	0.7882015		
Corrected Total	1183	970.9594595			

R-Square	Coeff Var	Root MSE	ban Mean
0.046975	31.69975	0.887807	2.800676

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	0.56620611	0.56620611	0.72	0.3969
ideology	1	0.74686437	0.74686437	0.95	0.3305
covidrate	1	2.40266607	2.40266607	3.05	0.0811
country	1	3.42613298	3.42613298	4.35	0.0373
country*covidrate	1	0.10710721	0.10710721	0.14	0.7125
humafam	1	4.53430805	4.53430805	5.75	0.0166*
humafam*covidrate	1	0.28262226	0.28262226	0.36	0.5494
humafam*country	1	1.04198271	1.04198271	1.32	0.2505
humafa*country*covidra	1	0.00241747	0.00241747	0.00	0.9558

Lastly, we examine symbolic racism. We find that symbolic racism predicts support for travel bans, such that those who are higher in symbolic racism are more likely to support a travel ban.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	72.1978300	8.0219811	12.17	<.0001
Error	1187	782.7413698	0.6594283		
Corrected Total	1196	854.9391999			

R-Square	Coeff Var	Root MSE	worry Mean
0.084448	28.06620	0.812052	2.893344

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	8.25071004	8.25071004	12.51	0.0004
ideology	1	21.27111014	21.27111014	32.26	<.0001
covidrate	1	5.15804016	5.15804016	7.82	0.0052
country	1	0.79615659	0.79615659	1.21	0.2721
country*covidrate	1	0.27888388	0.27888388	0.42	0.5156
sr	1	0.19458880	0.19458880	0.30	0.5871

sr*covidrate	1	0.69446689	0.69446689	1.05	0.3050
sr*country	1	0.38614569	0.38614569	0.59	0.4443
sr*country*covidrate	1	0.00088370	0.00088370	0.00	0.9708

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	54.1915327	6.0212814	7.71	<.0001
Error	1187	926.4868299	0.7805281		
Corrected Total	1196	980.6783626			

R-Square	Coeff Var	Root MSE	ban Mean
0.055259	31.53950	0.883475	2.801170

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	1.86469149	1.86469149	2.39	0.1225
ideology	1	5.70614873	5.70614873	7.31	0.0070
covidrate	1	0.32674782	0.32674782	0.42	0.5177
country	1	2.19452718	2.19452718	2.81	0.0938
country*covidrate	1	0.51080070	0.51080070	0.65	0.4187
sr	1	10.34545550	10.34545550	13.25	0.0003*
sr*covidrate	1	2.07413827	2.07413827	2.66	0.1033
sr*country	1	0.00097858	0.00097858	0.00	0.9718
sr*country*covidrate	1	0.05593601	0.05593601	0.07	0.7890

In sum, moderation effects were spotty. Beliefs in biological differences between Blacks and Whites (Hoffman et al., 2016) were again a significant predictor of worry, irrespective of condition, F (1, 1188) = 3.89, p = .049, η2 = .007, 95% CI = [.0007, .019], such that participants who endorsed more biological beliefs reported more worry. This effect was qualified by COVID-19 rate condition and country condition, F (1, 1188) = 3.89, p = .051, η2 = .003, 95% CI = [.000, .012], and F (1, 1188) = 3.76, p = .053, η2 = .003, 95% CI = [.000, .012], respectively. Follow-up regressions by rate condition revealed that biological beliefs were predictive in the low-rate condition, F (1, 600) = 7.97, p = .005, but not in the high-rate condition, F (1, 590) = .01, p = .939. Notably, follow-up regressions by country condition revealed that biological beliefs were predictive in the Africa condition, F (1, 592) = 7.20, p = .008, but not the Europe condition, F (1, 598) = .03, p = .854. This is consistent, then, with our claim that dated notions of race as biological are related to modern day beliefs about disease.

Dehumanization was also a predictor; specifically, results revealed a significant three-way interaction between country, COVID-19 rate, and dehumanization, operationalized as a difference score between participants' humanization ratings of "Whites" and "Blacks," F (1, 1167) = 4.26, p = .039, η2 = .003, 95% CI = [.000, .013]. Follow-up regression by condition revealed that dehumanization was, unexpectedly, only a significant predictor in the high-rate and Europe condition, F (1, 287) = 3.82, p = .052, such that more dehumanization was associated with greater worry. Moreover, humanization of Black people (i.e., participants' humanization ratings of "Blacks," irrespective of their ratings of "Whites") also predicted worry. More humanization of Black people was associated with less worry, F (1, 1174) = 6.47, p = .011, η2 = .005, 95% CI = [.0002, .016]. Interestingly, symbolic racism was not a significant predictor of worry (see Supplemental Materials).

With regards to support for a travel ban, biological beliefs also predicted this variable. Specifically, greater endorsement of biological beliefs was associated with greater support for a travel ban, F (1, 1188) = 4.12, p = .043, η2 = .003, 95% CI = [.000, .013]. Dehumanization also predicted support for a travel ban; specifically, results revealed a three-way interaction between country, COVID-19 rate, and dehumanization, F (1, 1167) = 6.60, p = .010, η2 = .005, 95% CI = [.0002, .017]. Follow-up analyses, regressing support for a travel ban onto dehumanization within each condition, however, did not reveal any significant relationships between dehumanization and support for a travel ban. Humanization ratings of “Blacks” (irrespective of humanization ratings of “Whites”) also predicted support for a travel ban, F (1, 1174) = 5.75, p = .017, η2 = .005, 95% CI = [.0001, .016], such that more humanization of Black people was associated with less support for a travel ban; or said differently, more dehumanization was associated with greater support for a travel ban. Again, symbolic racism did not moderate condition effects, nor did political ideology. Taken together, the individual differences measures paint a somewhat complicated picture although, consistent with our premise, biological beliefs about race were associated with greater worry about COVID-19 in the Africa vs. Europe conditions, and also support for a travel ban. We note, however, that these were statistically small effects.

Additional results for “Relevance to COVID-19” experiment: Travel restrictions

Here, we again conducted a 2X2 ANCOVA, controlling for ideology and participant race.

Dependent Variable: travel restrict

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	41.723052	8.344610	6.30	<.0001
Error	1192	1578.774444	1.324475		
Corrected Total	1197	1620.497496			

R-Square	Coeff Var	Root MSE	travel restrict Mean
0.025747	36.45501	1.150858	3.156928

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	2.84356170	2.84356170	2.15	0.1431
ideo	1	0.20302376	0.20302376	0.15	0.6955
country	1	18.94638730	18.94638730	14.30	0.0002
covidrate	1	19.40604235	19.40604235	14.65	0.0001
country*covidrate	1	0.66125015	0.66125015	0.50	0.4800

Like the results for support for a travel ban, results revealed a main effect of condition and COVID-19 rate, such that participants were more supportive of travel restrictions in the high (vs. low) COVID-19 rate condition and in the Africa (vs. Europe) condition. These results hold when also controlling for spread-related third variables.

Additional results for "Relevance to COVID-19" experiment: National context

As noted in the text, this experiment examined COVID-19 responses in the context of the US. All respondents read about a hypothetical state in which they did not live, receiving information about the state such as education levels and poverty rates (relative to the US as a whole). They also randomly were assigned to conditions that varied the population of Black citizens in the state (high vs. low) and the COVID-19 rate (high vs. low). The design thus matched the experiment described in the main text but focused on a state instead of a country, operationalizing race with population percentage instead of a country's location. We then asked respondents the same outcome variables as in the other experiment.

Here, we test whether COVID rate (high vs. low), Black population (high vs. low), and their interaction affected participants' reported worry and support for travel bans. We conducted a 2X2 ANCOVA, controlling for ideology and participant race. Controlling for spread-related variables did not change the results reported here in a meaningful way.

For worry, results revealed a main effect of COVID-19 rate, such that participants reported greater worry in the high (vs. low) rate condition, F (1, 1204) = 25.43, $p < .0001$, $\eta^2 = .02$. Black population was not significant, nor was the interaction with COVID-19 rate.

Dependent Variable: worry

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	103.2667400	20.6533480	31.52	<.0001
Error	1204	788.8915704	0.6552256		
Corrected Total	1209	892.1583104			

R-Square	Coeff Var	Root MSE	worry Mean
0.115749	28.73963	0.809460	2.816529

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	13.03483788	13.03483788	19.89	<.0001
ideo	1	60.99159131	60.99159131	93.08	<.0001
trace	1	0.76411889	0.76411889	1.17	0.2804
covidrate	1	16.66484045	16.66484045	25.43	<.0001
trace*covidrate	1	0.51968803	0.51968803	0.79	0.3733

Results for travel ban support mirrored these results. Analyses revealed a main effect of COVID-19 rate, such that participants reported greater support for travel bans in the high (vs. low) rate condition. Black population was not significant, nor was the interaction with COVID-19 rate.

Dependent Variable: ban

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	99.307053	19.861411	23.82	<.0001
Error	1204	1004.072286	0.833947		
Corrected Total	1209	1103.379339			

R-Square	Coeff Var	Root MSE	ban Mean
0.090003	35.06761	0.913207	2.604132

Source	DF	Type III SS	Mean Square	F Value	Pr > F
white	1	2.79914350	2.79914350	3.36	0.0672
ideo	1	57.83719006	57.83719006	69.35	<.0001
black_pop	1	0.06706222	0.06706222	0.08	0.7768
covidrate	1	32.00454331	32.00454331	38.38	<.0001
black_pop*covidrate	1	0.03587752	0.03587752	0.04	0.8357

Note that our manipulation of the Black population was quite subtle; it did not draw a lot of attention and, in both conditions, the state was described as majority White. Specifically, the "low" Black state was said to have a 14% Black population whereas the "high" Black state was said to have a 28% Black population. It could be that a stronger manipulation would have yielded different results. For example, a majority Black city with high (or even low) COVID-19 rates might have increased worry and support for travel restrictions.

Study 1	Worry				Ban				Abortion			
	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d
	France	1.41	0.882	0.24	France	0.195	0.397	0.34	France	0.577	0.5	0.26
	Mexico	1.26	0.879	0.41	Mexico	0.199	0.4	0.33	Mexico	0.57	0.5	0.27
	Vietnam	1.32	0.847	0.35	Vietnam	0.275	0.448	0.14	Vietnam	0.667	0.473	0.07
	Nigeria	1.62	0.881		Nigeria	0.342	0.476		Nigeria	0.7	0.461	

Study 2	Worry				Ban				Abortion			
	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d
	France	1.26	0.855	0.36	France	0.042	0.204	0.15	France	0.617	0.491	0.20
	Mexico	1.16	0.769	0.51	Mexico	0.024	0.154	0.24	Mexico	0.643	0.485	0.15
	Vietnam	1.02	0.663	0.74	Vietnam	0.042	0.202	0.15	Vietnam	0.729	0.449	-0.04
	Nigeria	1.55	0.769		Nigeria	0.077	0.269		Nigeria	0.712	0.457	

Study 3	Worry				Ban				Abortion			
	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d
	Brazil	2.51	0.866	0.40	France	0.4	0.491	0.34	France	0.639	0.482	0.11
	China	2.46	0.903	0.45	Mexico	0.385	0.488	0.38	Mexico	0.66	0.475	0.06
	Germany	2.37	0.826	0.59	Vietnam	0.381	0.487	0.38	Vietnam	0.609	0.489	0.17
	Ghana	2.85	0.814		Nigeria	0.57	0.496		Nigeria	0.69	0.464	

COVID-19 Study	Worry				Ban				Travel Restrictions			
	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d	Condition	Mean	SD	Cohen's d
	Europe	2.78	0.881	0.26	Europe	2.69	0.936	0.24	Europe	3.03	1.18	0.22
	Africa	3	0.793		Africa	2.91	0.859		Africa	3.28	1.13	

Note: All effect sizes are Cohen's d between the Africa condition and the other, respective conditions.

References

Flores, A. R., Herman, J. L., Gates, G. J. & Brown, T. N. T. (2016). How many adults identify as transgender in the United States? *The Williams Institute*.

Hoffman, K. M., Trawalter, S., Axt, J. R., & Oliver, M. N. (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proceedings of the National Academy of Sciences*, *113*(16), 4296-4301

Williams, M. J., & Eberhardt, J. L. (2008). Biological conceptions of race and the motivation to cross racial boundaries. *Journal of Personality and Social Psychology, 94*(6), 1033–1047.