# Anti-Asian discrimination and the Asian-white mental health gap during COVID-19

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# Anti-Asian discrimination and the Asian-white mental health gap during COVID-19

**Abstract:** The COVID-19 pandemic has led to widespread mental health issues. In this article, we consider how, due to a spike in anti-Asian hate crimes across the country, Asians might face a disproportionate mental health impact of the COVID-19 pandemic. Analyzing data from the University of Southern California's Center for Economic and Social Research *Understanding Coronavirus in America* survey, we report several major findings. First, since the onset of the COVID-19 pandemic, Asians (Asian Americans in particular) have experienced higher levels of mental disorders than whites. Second, Asian Americans and Asian immigrants are about twice as likely as whites to report having encountered instances of COVID-19-related acute discrimination. Third, experiences of COVID-19-associated discrimination have led to increased mental disorders for all Americans. Finally, COVID-19-related acute discrimination partially explains the disproportionate mental health impact of the COVID-19 pandemic on Asians. In conclusion, we highlight the importance of tackling hate, violence, and discrimination so as to address the disproportionate mental health impatcs of COVID-19 on minority populations.

Keywords: COVID-19, mental health, anti-Asian discrimination, Asians, Temporal analysis, Understanding Coronavirus in America survey

## Introduction

On March 19, 2020, Asian American and Pacific Islander (AAPI) Civil Rights Organizations launched the STOP AAPI HATE project to track incidents of anti-Asian violence and discrimination during COVID-19. Since its inception, the STOP AAPI HATE reporting center has received over 2,500 reports of coronavirus hate events from Asian Americans across the United States. A majority of respondents believed that they were targeted because of their race.[1] This race-based targeting has occurred despite the fact that, prior to the pandemic, Asians reported low levels of harassment, threats, and insults.[2]

Asian Americans also reported fewer mental health conditions than their white American counterparts prior to the pandemic (Asnaani et al. 2010). Encountering instances of acute discrimination may well impact Asians' mental health (Lee and Ahn 2011). Indeed, racism is a central societal force that adversely affects the health of racial and ethnic minority populations (Williams and Mohammed 2013). In particular, a large body of research has shown that experiences and perceptions of racial discrimination have deleterious mental health consequences (Noh et al. 1999; Harrell 2000; Meyer 2003; Carter 2007; Gee et al. 2007; Beiser and Hou 2016; Ong et al. 2017). For example, focusing on Asian American and Latino college students, Hwang and Goto (2008) find that perceived racial discrimination is associated with higher psychological distress, suicidal ideation, anxiety, and depression (see also Gee at al. 2007). Gee and colleagues (2009) review a total of 62 empirical studies that consider the relationship between discrimination and health among Asian Americans. Most studies in their review show that discrimination is associated with poorer health, and that there is a significant impact of discrimination on mental health problems.

Recently, we have conducted a nationally representative survey studying the social impacts of the COVID-19 pandemic on Canadians (Kennedy et al, 2020).

[1] http://www.asianpacificpolicyandplanningcouncil.org/wp-content/uploads/STOP_AAPI_Hate_National_Report_3.19-8.5.2020.pdf
[2] https://naasurvey.com/wp-content/uploads/2017/05/NAAS16-post-election-report.pdf

Analyzing the data, we find that higher incidences of acute discrimination encountered by East Asian Canadians during the COVID-19 pandemic explain their higher levels of mental health symptoms as compared to white Canadians (Wu et al. 2020). In this study, we investigate whether Asians in the United States have experienced more mental health symptoms than whites during the COVID-19 pandemic and if so, whether the instances of acute discrimination they have encountered help to explain this disproportionate mental health impact of the COVID-19 pandemic. We focus on Asians because research suggests that the rise in the animosity is directed at Asians rather than other minority groups (Lu and Sheng 2020) and that Asians are more likely than other racial or ethnic groups to perceive COVID-19-related discrimination (Liu et al. 2020). While several studies have already considered the effect of anti-Asian racism on mental helath among the targeted populations (e.g., Cheah et al. 2020; Liu et al. 2020; Ma 2020; Ma and Miller 2020; Zhai and Du 2020; Wu et al. 2020), we seek to advance the current knowledge in two major ways.

First, we pay particular attention to the difference between US-born Asians (i.e., Asian Americans) and foreign-born Asians (i.e., Asian immigrants). There are a number of reasons to expect that immigrants might have better health including selection effects, previous experience with managing challenges, and a lack of socialization into a context of racialization (Feliciano 2020; Güngör and Perdu 2017). Thus, during the COVID-19 pandemic, Asian Americans and Asian immigrants may have fared differently in the face of rising racist attacks. In doing so, this study will provide evidence for the need of group-specific mental health interventions and support in response to the COVID-19 pandemic (Xiang et al. 2020; Wu et al. 2020).

Second, we use temporal analysis and panel data analysis to better establish causality between COVID-19-related discrimination and mental health. We use data from the ongoing *Understanding Coronavirus in America* survey conducted by the University of Southern California's Center for Economic and Social Research. Not only is the dataset large, it is also a longitudinal panel in structure. The sample we analyze includes 68,218 data points that track 7,778 individuals over 13 survey waves from March to September (including 5,958 whites, 244 US-born Asians, and 300 foreign-born Asians).

Given that temporality is central to causal inference (Grzymala-Busse 2011), the dataset allows to consider how acute discrimination interacts with time to shape mental health among Asian Americans, Asian immigrants, and whites. This temporal analysis allows us to assess whether changes in COVID-19-related discrimination are associated with changes in mental health among Asians and whites. Because of the panel design of the data, we are also able to use fixed and random effects models to estimate both within- and between-individual changes. Therefore, this study provides a strong causal test of whether COVID-19-related discrimination leads to poorer mental health.

## Background

### *The Rise of Anit-Asian Hate in the Wake of COVID-19*

Asians have increasingly been discriminated against and become the targets of racism attacks since the onset of the COVID-19 pandemic. In March, a national online survey of 1,141 US residents showed that more than 40% of Americans reported that they had engaged in at least one discriminatory behavior toward people of Asian descent (Dhanani and Franz 2020). Based on a survey of Chinese American parents and their children conducted between March 2020 and May 2020, Cheah and colleagues (2020) found that nearly half of the parents and youth reported being directly targeted by COVID-19-related racial discrimination online. In June, the Pew Research Center (2020) surveyed 9,654 US adults and found that, since the start of the coronavirus outbreak, 31% of Asians had been subject to slurs or jokes because of their race/ethnicity, compared to 21% for Blacks, 15% for Hispanics, and 8% for whites. In addition, 26% of Asian Americans said that they feared someone might threaten or physically attack them. Moreover, the survey found that more than 40% of US adults agreed that "it has become more common for people to express racist views toward Asians".

Factors that lead to the rise of anti-Asian racism include not only fear and uncertainty inherent to novel infectious disease (Noel 2020), the presumptive origin of COVID-19 (Chen 2020), and misleading media coverage (Darling-Hammond et al. 2020; Wen et al. 2020; Schild et al. 2020) but also, more importantly, the historical antecedents

that link Asian Americans to infectious diseases and the long-standing stereotype that characterizes Asian Americans as "perpetual foreigners" (Cheah et al. 2020; Litam 2020; Man 2020; Mamuji et al. 2020; Tessler et al. 2020; White 2020). Indeed, people of Asian decent have experienced both verbal and physical violence motivated by racism and xenophobia from the time they arrived in America in the late 1700s up until the present day (Gover et al. 2020). Therefore, as Chen and colleagues (2020:556) put it, "In the midst of the COVID-19 pandemic we see not only a rise in anti-Asian sentiment, but also a recapitulation of history."

*Minority Stress Theory*

To explain how racism and discrimination adversely affect the mental health of those who have this experience, scholars draw on minority stress theory (Meyer 2003; Harrell 2000; Carter 2007). Minority stress theory was first developed and mainly used to understand mental health conditions of sexual minorities such as lesbians and gays (e.g., Meyer 1995; Szymanski and Sung 2010). This theory posits that stigma, prejudice, and discrimination often create "a hostile and stressful social environment" and that excess in social stressors explains the higher prevalence of mental disorders among minority populations (Meyer 2003: 674; Harrell 2000).

Minority stress theory is increasingly applied in studies of how racism and discrimination affect mental health of ethnic and racial minorities (e.g., Wei et al. 2008). In this line of research, Carter (2007) has used a new term, race-based traumatic stress, to specifcially explain how targets of racism can be harmed psychologically by stress and trauma. At length, Carter (2007) explains that acute stress disorder and post-traumatic stress disorder can arise from the events or danger related to real or perceived racial discrimination, including threats of harm and injury, humiliating and shameful events, and witnessing harm to other minorities or people of color. Furthermore, eveyday experiences of racial discrimination often lead to a chronic state of "racial battle fatigue" that taxes the mental and emotional resources of targeted populations (Smith et al. 201: 64). Consistent with this body of theoretical work, empirical studies that focus on Asians in North America have demonstrated that both real and perceived discrimination are a

unique source of stress that leads to mental disorders above and beyond general stress (e.g., Dion 1992; Wei et al. 2010).

*Anti-Asian Racism and Mental Health among Asians*

Several studies have specifically looked into the rise of anti-Asian racism and how it might affect mental health among the targeted populations. For example, drawing on a survey conducted between March and May, Cheah and colleagues (2020) found that being the direct target of racial discrimination, both in-person and online, and perceptions of Sinophobia were associated with poorer psychological well-being for Chinese American parents and their children. Through increased stress, parents' own racial victimization experiences also impacted their children's mental health (Cheah et al. 2020). In addition, using data from the first few waves of the *Understanding Coronavirus in America* survey, scholars show that the increased perception of COVID-19-associated discrimination has led to increased mental distress among Asians (Liu et al. 2020).

Other studies have considered more specific groups such as Chinese overseas students (Ma 2020; Ma and Miller 2020) and ethnic Chinese travellers (Zheng et al. 2020). These studies largely conclude that experiencing or witnessing anti-Asian racism has deleterious mental health impacts. For example, Zhai and Du (2020) point out that, since the pandemic began, not only have international Chinese students been living with the fear that their families in China are at risk of contracting COVID-19, they also have to face discrimination, endure isolation, and experience or witness hate crimes. Fear and negative experiences likely cause mental health problems for Chinese international students (Zhai and Du 2020; see also Ma and Miller 2020).

When explaining the association between COVID-19-associated discrimination and mental health, scholars have also drawn on minority stress theory or race-based traumatic stress theory. Litam (2020) points out that Asians' ongoing experiences of microaggressions and racial discrimination during the pandemic contribute to not only the presence of race-related stress but also race-based trauma. Additionally, experiences of racial discrimination can threaten individuals' identity and sense of control, thereby leading to hopelessness and the internalization of negative attitudes (Cheah et al. 2020).

Race-based stress and racial trauma in turn have deleterious effects on mental health (Cheng 2020; Cheah et al. 2020; Hu et al. 2020).

## Data and Methods

The data come from the University of Southern California's Center for Economic and Social Research "*Understanding Coronavirus in America*" tracking survey. Survey respondents are members of their Understanding America Study (UAS), which is a nationally representative Intenet panel of American households that includes approximately 8,500 individuals aged 18 and older. Specifics about the survey desgin and methodology are available online (https://covid19pulse.usc.edu/). Note that data collection through the UAS Internet surveys matches that in high-quality traditional surveys (Angrisani et al. 2019).

The ongoing *Understanding Coronavirus in America* survey tracks both attitudes and behaviors related to the COVID-19 pandemic. On March 10, 2020, all UAS panel members were invited to participate in the first wave of the *Understanding Coronavirus in America* survey. The first wave of the survey stayed in the field through March 31 (Wave 1, March 10 to March 31, 2020). Starting from April 1, a new survey has been fielded every two weeks where one fourteenth of the panel members are invited to take the survey on a pre-assigned day of the week. The total field period is four weeks because respondents have two weeks to answer the survey. By the end of Septermber 2020, thirteen waves of data have been collected. We use data from all 13 waves collected from March 10$^{th}$ to September 30$^{th}$, 2020. The final sample we analyze includes 68,218 data points, tracking 7,778 individuals over 13 survey waves from March to September.

In this research, we focus on three groups: whites, Asian Americans (US-born), and Asian immigrants (foreign-born). We define whites as respodnents who self-identified as white only. Among those who self-identified as Asian, we make the distinction between those who were born in the US, and those who were born outside the US. Of the 7,778 respondents in our analysis, 5,958 were non-Hispanic whites, 244 were US-born Asians, and 300 were foreign-born Asians. Because we find no signficant gap in mental health between US-born and foreign-born whites, we combine them together as one single group in the anlaysis.

The survey includes the four-item Patient Health Questionnaire (PHQ-4), a widely-used measure of anxiety and depression (Löwe et al. 2004). The PHQ-4 index

ranges from 0 to 12 representing the combined responses to four questions: "*over the last two weeks, how often the respondent had been bothered by 1) feeling nervous, anxious or on edge, 2) not being able to stop or control worrying, 3) feeling down, depressed or hopeless, and 4) little interest or pleasure in doing things*" (see also Riehm et al. 2020: 631). The responses range from *0=not at all, 1=several days, 2=more than half the days,* to *3=nearly every day*. Higher scores indicate a greater prevalence of mental health issues.

The survey also asks whether, during the past two weeks, the respondent was treated with less courtesy and respect due to others thinking they had COVID-19, received poorer sevice due to others thinking they had COVID-19, was threatened or harassed due to others thinking they had COVID-19, and was the subject of other people's fear due to others thinking they had COVID-19. All four items were answered on a 3-point scale (0=no,1=unsure, 2=yes). We combine these items to create an acute discrimination scale ranging from 0 to 8, with higher scores indicating more encounters of acute discrimination (Williams et al. 1997; Wu et al. 2020). As all the items are specifically related to COVID-19, we use the combined scale to indicate COVID-19-associated discrimination. We also note here that these items were not asked in Waves 7 and 9; therefore, data from these two waves were not incldued in some of our analyses.

Our analysis also includes controls such as a continuous measure of eductaional level (1-16), a continuous measure of household income level (1-16), gender (0=male, 1=female), age, and dummies indicating the month when the wave of survey was carried out. Table 1 provdies the descriptive statistics of key variables in our analysis.

Table 1. Descriptive statistics of key variables in the analysis, calculated at the person-wave level

| | Whites (n=53,051) | | Asian Americans (n=2,006) | | Asian immigrants (n=2,534) | |
|---|---|---|---|---|---|---|
| Variable | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Mental disorders (PHQ-4, 0-12) | 1.98 | 2.80 | 2.96 | 3.36 | 2.16 | 2.92 |
| Acute discrimination (0-8) | 0.31 | 1.04 | 0.75 | 1.69 | 0.68 | 1.57 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Household income (level, 1-16) | 11.70 | 3.87 | 11.83 | 4.35 | 11.42 | 4.53 |
| Education (level, 1-16) | 11.38 | 2.25 | 12.36 | 1.99 | 12.52 | 2.36 |
| Female (0=male, 1=female) | 0.57 | 0.49 | 0.54 | 0.50 | 0.58 | 0.49 |
| Age (in years, 18-110) | 52.27 | 16.00 | 40.42 | 14.77 | 45.87 | 15.46 |

Our estimation takes two steps. First, taking advantage of the panel structure of the survey, we use a fixed-effects model to estimate how experiecing COVID-19-related discrimination affects mental health. Fixed-effects models remove the effect of time-invariant characteristics (e.g., race, gender, place of birth) and thus, estimate the effect of acute discrimination on mental health that is unbiased by person-level unobserved heterogeneity (Torres-Reyna 2007). The use of a fixed-effects model is further supported by the Hausman test ($Chi^2$=461.95, p<0.000). The fixed-effects model helps establish whether experiencing COVID-19-related discrimination *causally* affects mental health.

Second, we use random-effects models to invetigate to what extent differences in encounters of COVID-19-related discrimination explain the mental helath gap between Asians and whites. We use the random-effects models for this purpose for two reasons. First, Asian-white categories are time-invariant. Second, we also believe that differences in socioeconomic status, cultural backgrounds, and life experiences across Asian Americans, Asian immigrants, and whites may also have a major influence on the mental health gaps between these groups.

**Findings**

To begin with, Figure 1A compares the mental disorders across whites, Asian Americans (US-born), and Asian immigrants (foreign-born). Overall, whites had a depression and anxiety score of of 1.98 [95% CI, 1.95 to 2.00], Asian Americans had a score of 2.96 [95% CI, 2.82 to 3.11], and Asian immigrants had a score of 2.16 [95% CI, 2.05 to 2.28]. These numbers show that the mental health gap between Asian Americans and whites (gap=0.98, $p$<0.000) is greater than the gap between Asian immigrants and whites

(gap=0.18, $p$<0.000). When we compare people who reported no mental health symptoms at all (PHQ-4 score=0), we find that 47% of whites had no mental health symptoms, whereas the respective figures were 33% for Asian Americans and 46% for Asian immigrants. Taken together, the results show that while the mental health gap between Asian Americans and whites is substantial, the gap between Asian immigrants and whites is small.

Figure 1A. Comparing mental disorders across whites, Asian Americans, and Asian immigrants

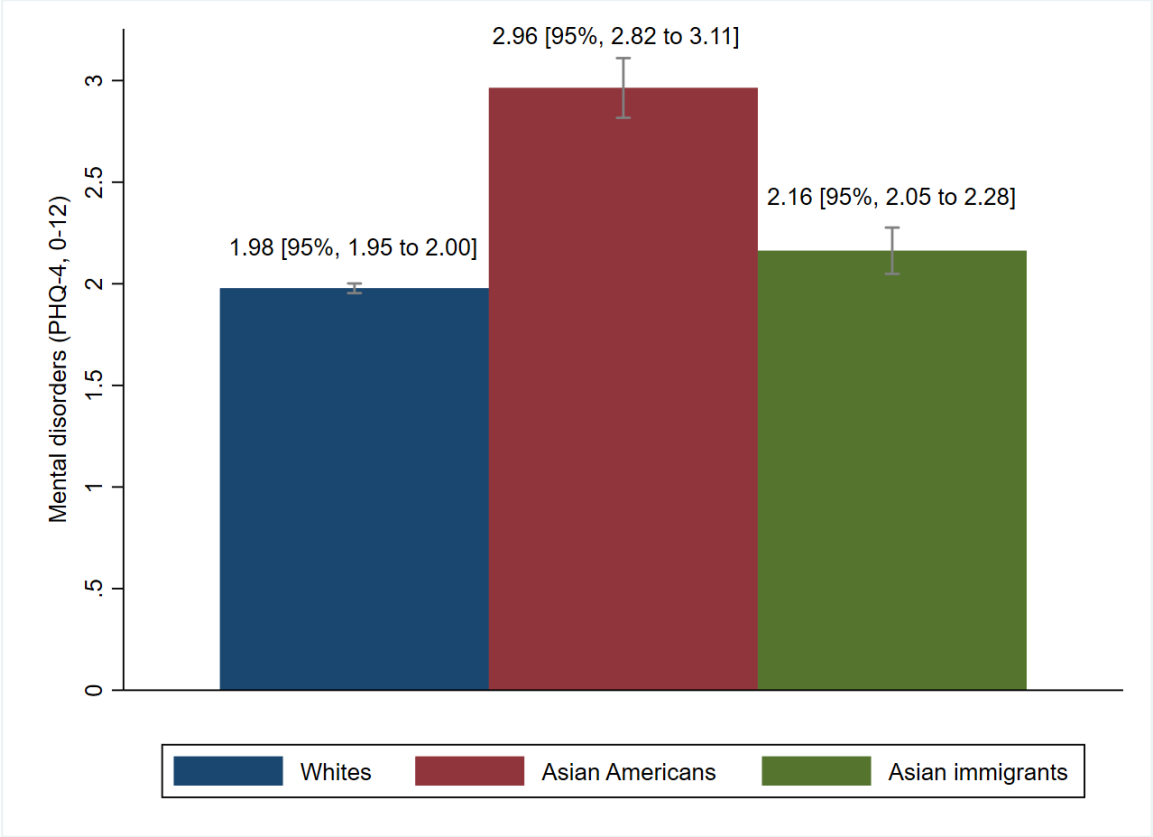
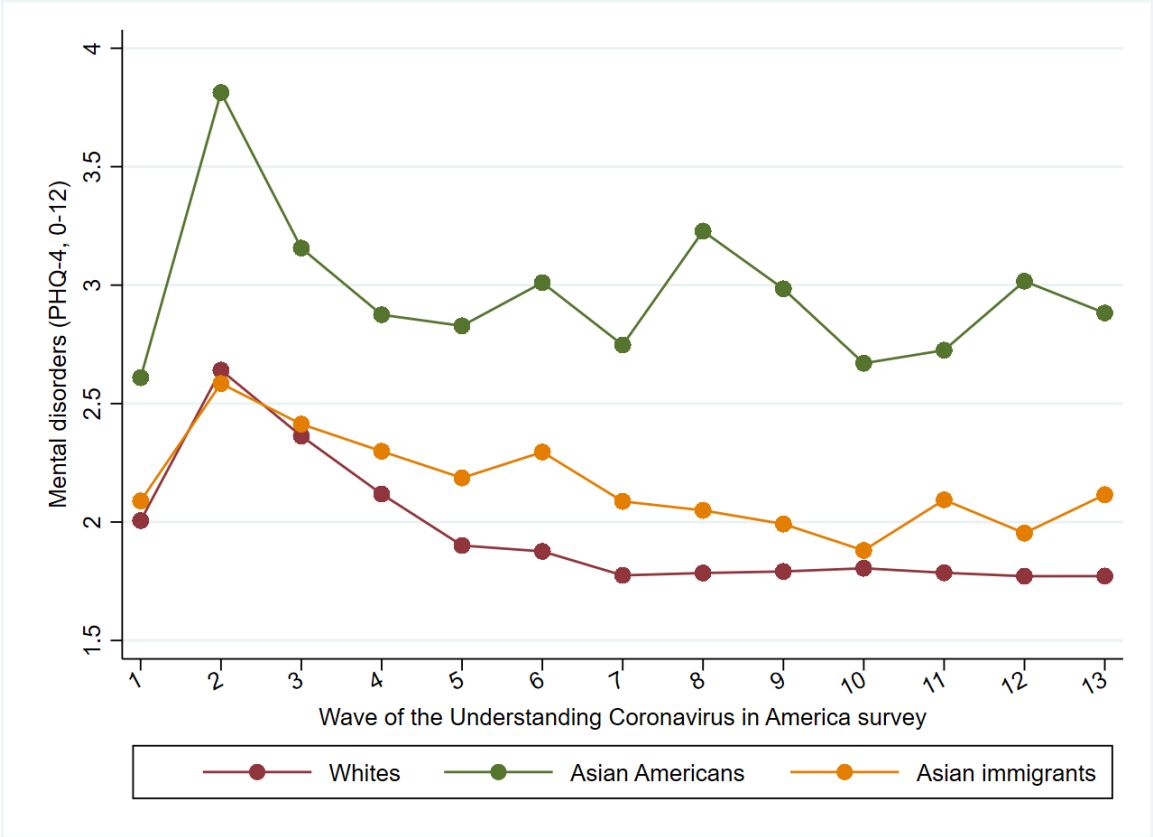



Figure 1B shows the temporal changes in mental disorders across the three groups from March to September (Waves 1-13; Wave 1 in March and thereafter, two waves in each month). It reveals several findings. First, the level of mental disorders is highest in April (Wave 2) for all three groups, suggesting that the COVID-19 pandemic has affected the mental health of all Americans. Indeed, across all three groups, we see an "n"-shaped

pattern in changes of their mental disorders before, during, and after April. Second, Asian Americans were hit harder than both whites and Asian immigrants. We see a significant gap in mental helath between Asian Americans and whites regardless of months or waves of the data. In terms of the mental health gap between Asian immigrants and whites, it was small in the early stages of the pandemic (Waves 1-3) but became greater after April (Waves 4-13).

Figure 1B. Temporal changes in mental disorders across whites, Asian Americans, and Asian immigrants




Next, we consider whether experiences of acute discrimination differed between whites, Asian Americans, and Asian immigrants. Figure 2A shows that, overall, whites had a mean discrimination score of 0.31 [95% CI, 0.30 to 0.32], Asian Americans had a mean score of 0.75 [95% CI, 0.68 to 0.82], and Asian immigrants had a mean score of 0.68 [95% CI, 0.62 to 0.74]. When we recode acute discrimination into a binary measure, we find that 11% of whites, 22% of Asian Americans, and 21 % of Asian

immigrants reported having encountered instances of COVID-19-related acute discrimination.

Figure 2A. Comparing acute discrimination across whites, Asian Americans, and Asian immigrants

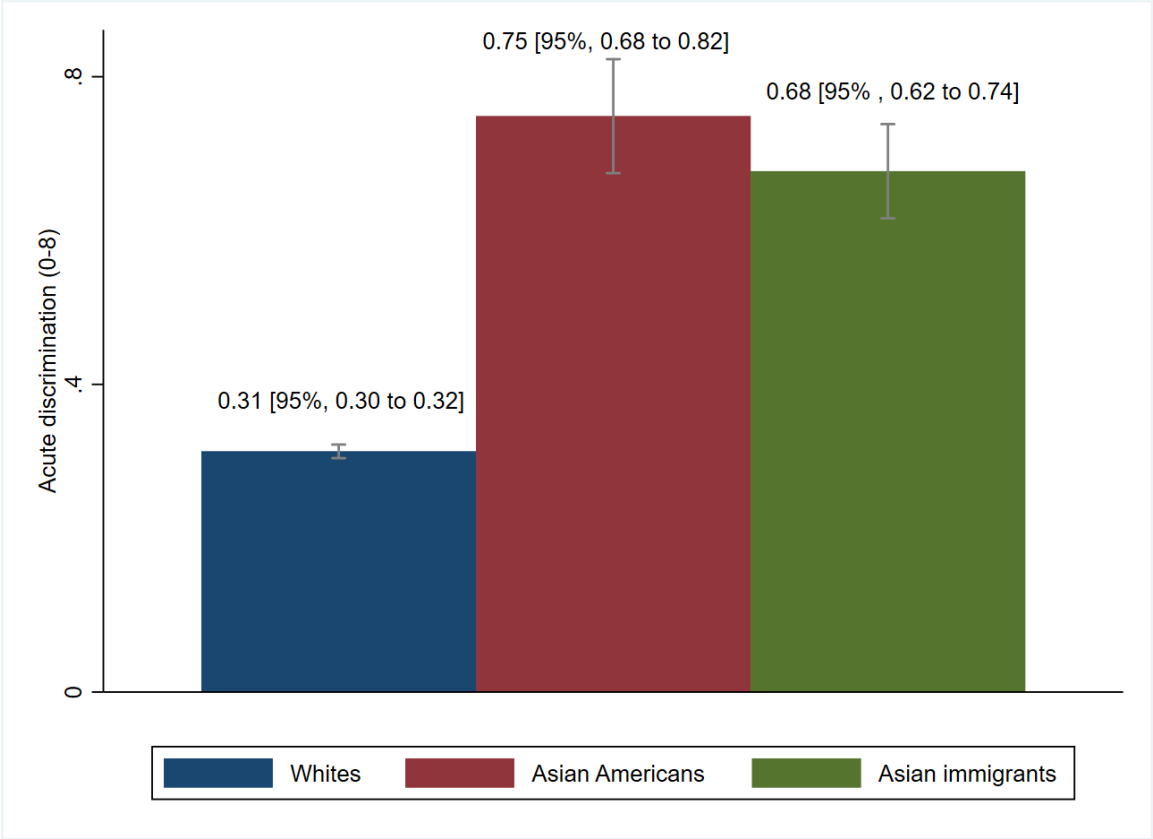
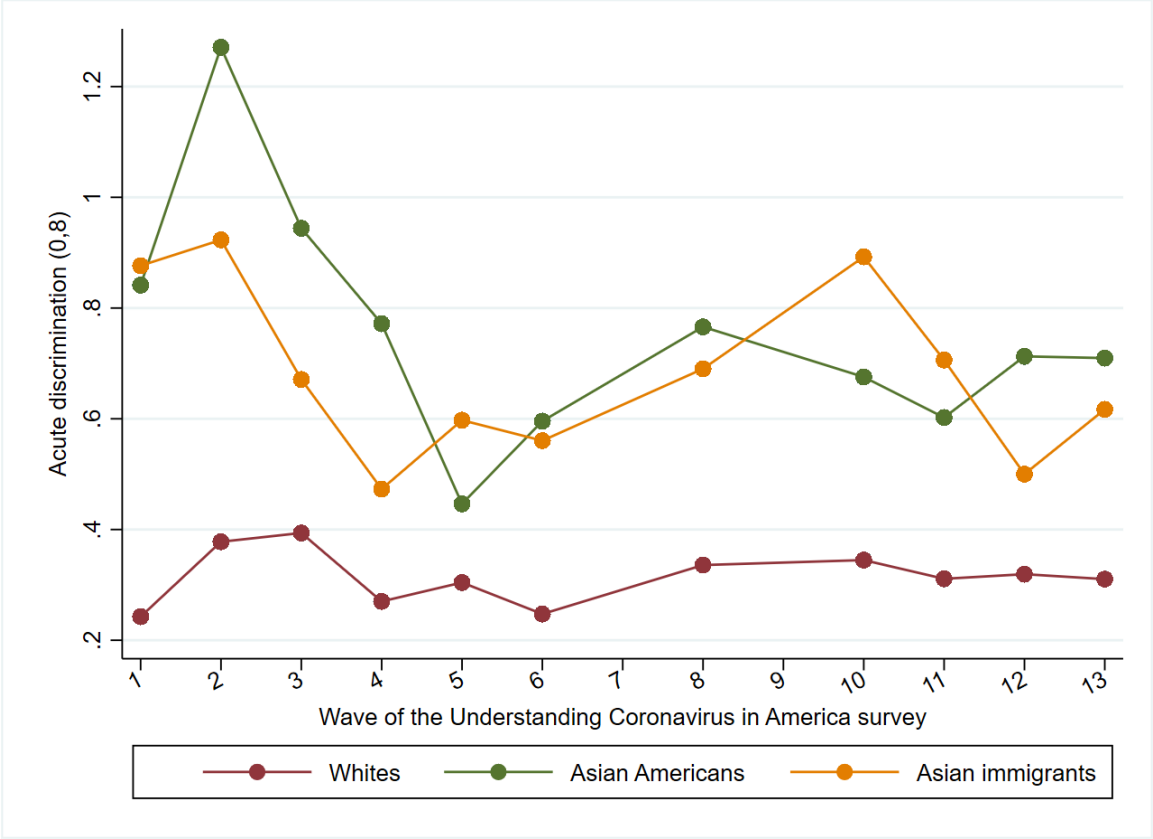



Figure 2B shows the temporal changes in experiences of acute discrimination across whites, Asian Americans, and Asian immigrants. Both Asian Americans and Asian immigrants reported significantly more instances of acute discrimination than whites, regardless of survey waves. While Asian immigrants and Asian Americans reported a similar level of discrimination, Asian immigrants reported a slighly higher level of discrimination than Asian Americans in March (Wave 1, the gap is not significant) but this changed in April and early May (Waves 2-4), with Asian Americans reporting significantly higher levels of discrimination than Asian immigrants.

Figure 2B. Temporal changes in acute discrimination across whites, Asian Americans, and Asian immigrants




These temporal analyses suggest that Asians face a disproportionate mental health impact of the COVID-19 pandemic (Figure 1B, see also Figure 1C in Appendix), and the higher instances of COVID-19-related acute discrimination Asians expereinced especially during April might epxlain the disproportionate mental health impact on them (Figure 2B, see also Figure 2C in Appendix). To test these arguments, we consider the extent to which experiences of acute discrimination during the pandemic explain the mental health gaps between whites and Asian Americans/immigrants.

To do so, we first consider whether COVID-19-associated discrimination contributes to mental disorders. Table 2 presents the results of our fixed-effects model (Model 1). It shows that a one-unit within-person increase in acute discirmination leads to a within-person increase in mental disorders by 0.066 units ($p<0.001$). The significant effect demonstrates that experiencing acute discrimination causally leads to increased mental disorders among all Americans.

Table 2. Fixed-effects model estimating the effect of COVID-19-related discrimination on mental disorders

| | Model (1) |
|---|---|
| | Mental disorders (PHQ-4) |
| Acute discrimination | 0.066*** |
| | [0.052, 0.08] |
| Constant | 1.975*** |
| | [1.96, 1.99] |
| *Residuals* | |
| sigma_u | 2.447 |
| sigma_e | 1.595 |
| rho | 0.701 |
| N (persons) | 7,778 |
| N (person_wave observations) | 68,218 |

95% confidence intervals in brackets

* p < 0.05, ** p < 0.01, *** p < 0.001

Next, we examine mental health gaps between whites and Asians and consider to what extent COVID-19-related discrimination accounts for these gaps. Table 3 reports the results from random-effects models. Model (2) shows that, after controlling for demographics including age, gender, education, and household income as well as the survey month, Asian Americans expereinced 0.569-unit [95% CI, 0.267 to 0.872] higher anxiety and depression than whites, whereas Asian immigrants experienced 0.012-unit [95% CI, -0.284 to 0.259] lower anxiety and depression than whites despite the gap not being statistically significant.

Model (3) shows that acute discrimination has a strong and significant impact on mental health: every one-unit increase in acute discrimination is associated with a 0.09-unit [95% CI, 0.075 to 0.105] increase in anxiety and depression. Model (3) also shows that, after taking acute discrimination into account, the mental health gap between Asian Amerians and whites decreases from 0.569 to 0.538, suggesting that acute discrimination

explains about 5% of the mental health gap between whites and Asian Americans. Furthermore, Model (3) shows that the magnitude of the mental health gap between whites and Asian immigrants increases from 0.012 to 0.044 after controlling for acute discrimination. This is to suggest that, in the absence of the higher instances of acute discrimination encountered by Asian immigrants as compared to whites (0.68 vs. 0.31), Asian immigrants would have had even lower relative levels of depression and anxiety than whites. Nevertheless, we interpret findings regarding the mental health gap between Asian immigrants and whites with caution, as neither coefficients (-0.012 in Model 2; -0.044 in Model 3) were significant.

Table 3. Random-effects models estimating Asian-white mental health gaps and the explanatory effect of acute discrimination encountered during the COVID-19 pandemic

| | Model (2) | Model (3) |
|---|---|---|
| | Mental disorders (PHQ-4) | Mental disorders (PHQ-4) |
| *Asian-white mental health gaps (ref. whites)* | | |
| Asian Americans | 0.569*** | 0.538*** |
| | [0.27, 0.87] | [0.24, 0.84] |
| Asian immigrants | -0.012 | -0.044 |
| | [-0.28, 0.26] | [-0.31, 0.23] |
| *Acute discrimination* | | 0.090*** |
| | | [0.08, 0.11] |
| *Controls* | | |
| Household income | -0.073*** | -0.071*** |
| | [-0.09, -0.06] | [-0.08, -0.06] |
| Female | 0.645*** | 0.655*** |
| | [0.53, 0.76] | [0.54, 0.77] |
| Age | -0.031*** | -0.030*** |
| | [-0.03, -0.03] | [-0.03, -0.03] |
| Education | 0.005 | 0.007 |
| | [-0.02, 0.03] | [-0.02, 0.03] |
| *Month of survey (ref. March)* | | |
| April | 0.508*** | 0.495*** |
| | [0.46, 0.56] | [0.44, 0.55] |
| May | 0.038 | 0.035 |
| | [-0.01, 0.09] | [-0.02, 0.09] |
| June | -0.066* | -0.066* |
| | [-0.13, -0.01] | [-0.13, -0.01] |
| July | -0.145*** | -0.154*** |
| | [-0.20, -0.09] | [-0.21, -0.10] |
| August | -0.156*** | -0.163*** |

| | | |
|---|---|---|
| | [-0.21, -0.11] | [-0.21, -0.11] |
| September | -0.174*** | -0.180*** |
| | [-0.23, -0.17] | [-0.24, -0.12] |
| Constant | 4.01*** | 3.89*** |
| | [3.66, 4.36] | [3.55, 4.24] |
| *Random-effects Parameters* | | |
| sigma_u | 0.802*** | 0.796*** |
| | [0.78, 0.82] | [0.78, 0.81] |
| sigma_e | 0.448*** | 0.447*** |
| | [0.44, 0.46] | [0.44, 0.45] |
| N (persons) | 6,487 | 6,487 |
| N (person_wave observations) | 57,591 | 57,591 |

95% confidence intervals in brackets

* p < 0.05, ** p < 0.01, *** p < 0.001

## Conclusion

Fear, stress, and depression are common experiences during public health crises. While the COVID-19 pandemic has led to widespread mental health issues, this has been unevenly borne (Pfefferbaum and North 2020). In this study, we find that Asian Americans and Asian immigrants reported having encountered more instances of COVID-19-related acute discrimination than whites. Asian immigrants and Asian Americans also experienced higher levels of mental disorders during the pandemic. Furthermore, we demonstrate that COVID-19-related acute discrimination partially explained mental health gaps between Asians and Whites. Our findings suggest that Asians worldwide may have to deal with not only the COVID-19 crisis but also the associated stigmatization, violence, and discrimination. Therefore, they are particularly vulnerable during the crisis. Notably, all types of acute discrimination examined in our study are directly related to COVID-19. As we are still in the pandemic, our consideration of COVID-19-associated discrimination and how it affects mental health of different population groups is unique and urgently needed.

It is essential to develop and implement group-specific mental health assessment and support (see also Xiang et al. 2020). For exmaple, considering that Asians often have the lowest utilization of mental health services, coordinating response to anti-Asian racism such as investment in menthal health services and community-based efforts is much needed (Misra et al. 2020). Because health professionals play a key role in

countering racism and its consequences, it is also important to ensure that medicine as a field continues to care for all minority communities (Li and Galea 2020; Lu 2002; Hu et al. 2020). At the policy level, public policies that aim to alleviate mental health issues in times of crisis must tackle the hate, violence, and discrimination experienced by members of targeted groups.

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Appendix

Figure 1C. Temporal changes in mental disorders across whites, Asian Americans, and Asian immigrants

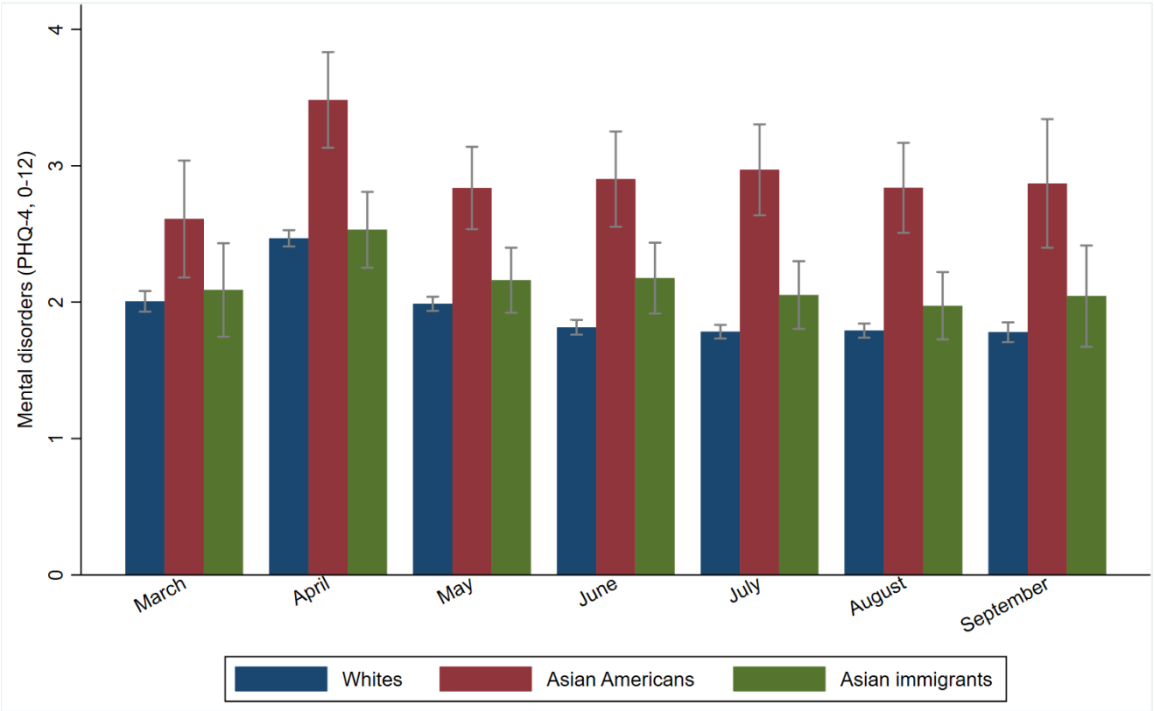
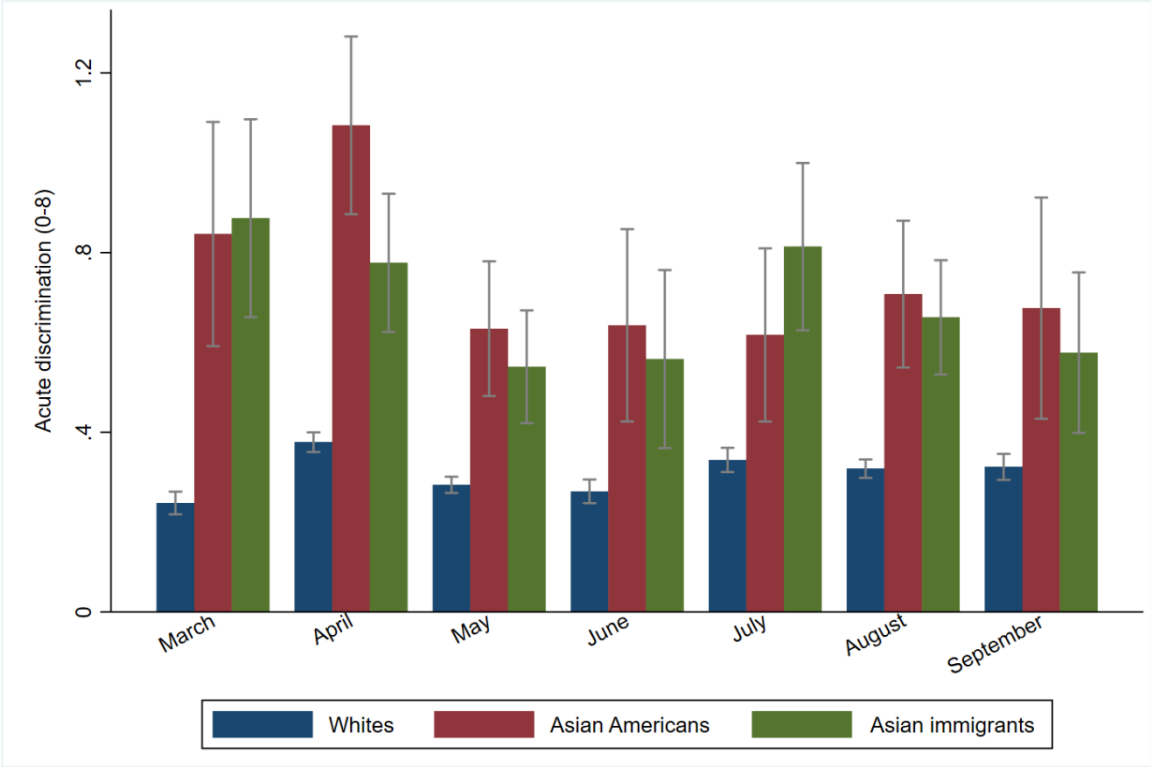



Figure 2C. Temporal changes in acute discrimination across whites, Asian Americans, and Asian immigrants


Acute discrimination (0-8)
0
.4
.8
1.2
March
April
May
June
July
August
September
Whites
Asian Americans
Asian immigrants