Title
Depression and Anxiety Changes Among Sexual and Gender Minority People Coinciding with Onset of COVID-19 Pandemic.

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Authors
Flentje, Annesa
Obedin-Maliver, Juno
Lubensky, Micah E
et al.

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INTRODUCTION
With SARS-COV-2 recently sweeping the globe, the population is experiencing a group stressor unlike any phenomenon in this country in the last century. How the pandemic experience is related to mental health challenges including anxiety and depression is unknown. Numerous factors—such as changes in community function; restriction of activities and social contacts; and fearfulness about the virus, the economic downturn, and food access—may contribute to poorer mental health. Marginalized populations, such as sexual and gender minority people (i.e., non-heterosexual people and trans-gender or gender-expansive people, respectively) may be particularly at risk for adverse impacts of the pandemic due to preexisting economic and health factors.1 We set out to document changes in depression and anxiety within The PRIDE Study, a longitudinal cohort of sexual and gender minority people, a vulnerable population.2

METHODS
Participants in The PRIDE Study, a longitudinal cohort study of sexual and gender minority people,2 were included if they completed mental health measures in the 2019 Annual Questionnaire (timepoint 1, June 2019—ongoing at time of data extraction) and in a COVID-19 impact ancillary study (timepoint 2, March 23, 2020, through April 19, 2020). Paired sample t tests examined changes in depression (9-item Patient Health Questionnaire, PHQ-93) and anxiety (7-item Generalized Anxiety Disorder Scale, GAD-7 4) symptoms overall and separately among those who screened positive (PHQ-9 and GAD-7 scores ≥ 103, 4) and negative (scores < 10) for depression and generalized anxiety disorder at timepoint 1.

RESULTS
In total, 2288 participants were included in this study (see Table 1 for participant characteristics). Depression symptoms increased by a mean PHQ-9 score of 1.21 (t[2280] = 11.35, p < .001, d = .20) from timepoint 1 to 2. Anxiety symptoms increased by a mean GAD-7 score of 3.11 (t[2282] = 27.95, p < .001, d = .54). Among individuals who screened positive for depression at timepoint 1, PHQ-9 scores decreased by a mean of 1.08 (t[670] = -4.80, p < .001, d = .21) at timepoint 2. Among individuals who screened negative for depression at timepoint 1, PHQ-9 scores increased by a mean of 2.17 (t[1609] = 19.58, p < .001, d = .53) at timepoint 2. Among individuals who screened positive for generalized anxiety at timepoint 1, there was no change in GAD-7 scores (t[508] = 1.01, p = .32, d = .06). Among individuals who screened negative for generalized anxiety at timepoint 1, GAD-7 scores increased by a mean of 3.93 (t[1773] = 32.93, p < .001, d = .88) at timepoint 2.

DISCUSSION
We found increases in anxiety and depression coinciding with the COVID-19 pandemic onset. Increased anxiety and depression symptoms were driven by people who did not have preexisting symptoms consistent with generalized anxiety or depression. While this study was conducted with sexual and gender minority people, the results may be relevant for other vulnerable populations, such as other minority groups.

Health care providers are advised to check in with patients about stress and to screen for mood and anxiety disorders, even among patients who had no prior history of anxiety or depression. Treatment and referrals can include traditional interventions such as individual therapy and medications and may also include COVID-19-specific supports implemented on a larger scale (e.g., supportive peer-led groups, mindfulness practice). This study is observational. Our finding that individuals with preexisting depression had improved mood from timepoint 1 to 2 may represent regression to the mean and should not be interpreted that these individuals have less depressive symptoms, as they already were experiencing symptoms of depression at timepoint 1. Future research will identify who is most at risk for adverse impact. In the interim, we should consider ways to support the mental health of all of our communities during the pandemic, with special care and attention to vulnerable populations.
Table 1 Demographic characteristics of N = 2288 sexual and gender minority individuals

| Participant characteristics | N (%)          |
|----------------------------|----------------|
| Age: mean, median (SD)     | 36.9, 31.9 (14.7) |
| Race/ethnicity,a n (%)     |                |
| American Indian/Alaska Native | 65 (2.8%)  |
| Asian                      | 98 (4.3%)     |
| Black/African American     | 78 (3.4%)     |
| Hispanic, Latino, or Spanish | 128 (5.6%)  |
| Middle Eastern or North African | 28 (1.2%)   |
| Native Hawaiian or Pacific Islander | 7 (0.3%) |
| White                      | 2116 (92.5%)  |
| Another race or ethnicity  | 26 (1.1%)     |
| Sexual orientation,a n (%) |                |
| Asexual                    | 268 (11.7%)   |
| Bisexual                   | 693 (30.3%)   |
| Gay                        | 834 (36.5%)   |
| Lesbian                    | 467 (20.4%)   |
| Pansexual                  | 320 (14.0%)   |
| Queer                      | 923 (40.3%)   |
| Questioning                | 56 (2.4%)     |
| Same-gender loving         | 97 (4.2%)     |
| Straight/heterosexual      | 39 (1.7%)     |
| Two-spirit                 | 13 (0.6%)     |
| Another sexual orientation | 86 (3.8%)     |
| Gender,a,b n (%)           |                |
| Agender                    | 99 (4.3%)     |
| Cisgender man              | 418 (18.3%)   |
| Cisgender woman            | 623 (27.2%)   |
| Genderqueer                | 300 (13.1%)   |
| Man                        | 562 (24.6%)   |
| Non-binary                 | 438 (19.1%)   |
| Questioning                | 85 (3.7%)     |
| Transgender man            | 279 (12.2%)   |
| Transgender woman          | 124 (5.4%)    |
| Two-spirit                 | 23 (1.0%)     |
| Woman                      | 500 (21.9%)   |
| Another gender identity    | 134 (5.9%)    |
| Sex assigned to individual at birth, n (%) |            |
| Female                     | 1428 (63.0%)  |
| Male                       | 840 (37.0%)   |
| Highest level of education, n (%) |        |
| Less than high school completion | 20 (0.9%) |
| High school diploma or equiv. | 487 (21.3%) |
| College degree (2- or 4-year) | 885 (38.7%) |
| Graduate degree            | 895 (39.1%)   |
| Income, n (%)              |                |
| $< 20,000                  | 797 (35.2%)   |
| $20,000 – $60,000          | 801 (35.4%)   |
| $60,000 – $100,000         | 369 (16.3%)   |
| $100,000+                  | 296 (13.1%)   |
| Mental health: mean, median (SD) |            |
| PHQ-9 timepoint 1          | 7.10, 6 (5.99) |
| PHQ-9 timepoint 2          | 8.31, 7 (6.43) |
| GAD-7 timepoint 1          | 5.78, 4 (5.21) |
| GAD-7 timepoint 2          | 8.89, 8 (6.22) |

*aIndividuals could select more than one option; thus, categories are not mutually exclusive.
*bThis includes people who were assigned a sex of birth of male or female, and only gender is reported here; thus, gender minority people may be found in all categories
*cCisgender is listed here as an identity label. Cisgender people can be found in multiple categories and may not endorse this identity label

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Annesa Flentje, PhD1,2,3
Juno Obedin-Maliver, MD3,4
Micah E. Lubensky, PhD1,3
Zubin Desatyr, MPH3
Torsten Nellands, PhD5
Mitchell R. Lunn, MD3,6

1Community Health Systems, University of California, San Francisco, San Francisco, CA, USA
2Alliance Health Project, Department of Psychiatry, School of Medicine, University of California, San Francisco, CA, USA
3The PRIDE Study/PRIDEnet, Stanford University School of Medicine, Stanford, CA, USA
4Department of Obstetrics and Gynecology, Stanford University School of Medicine, Stanford, CA, USA
5Division of Nephrology, Department of Medicine, Stanford University School of Medicine, Stanford, CA, USA

Corresponding Author: Annesa Flentje, PhD; The PRIDE Study/PRIDEnet, Stanford University School of Medicine, Stanford, CA, USA (e-mail: annesa.flentje@ucsf.edu).

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