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Letter to the Editor

Three months of loneliness during the COVID-19 lockdown



A B S T R A C T

The majority of the U.S. population has been under stay-at-home restrictions to reduce the spread of COVID-19 since March 2020. Over the first three months of restrictions, 3,121 U.S. adults completed the UCLA Loneliness Scale-3 and Patient Health Questionnaire-9 (PHQ-9). Despite relaxation of lockdowns and shelter-in-place orders over that time, loneliness scores increased significantly, particularly from April to May 2020, and appear to have plateaued by June. Loneliness was correlated with depression and suicidal ideation at all time points and was most prevalent among individuals who reported that they were still under community restrictions to socially isolate due to the novel coronavirus. Loneliness remains elevated despite the reopening of many communities.

Dear Editor,

The ongoing COVID-19 pandemic is dramatically impacting everyday social interactions and mental health. Since the middle of March 2020, people in most communities throughout the United States have been encouraged to stay home and shelter-in-place to slow the transmission of the virus. While the magnitude of these restrictions differed regionally, nearly everyone has been profoundly affected. We recently reported that the severity of loneliness increased during the first month of the lockdown period (i.e., mid-April 2020) relative to normative data prior to the COVID-19 pandemic (Killgore et al., 2020). Since our previous report, the situation has continued to evolve. Some, but not all, communities have relaxed restrictions on public movement and social gatherings in the months following the initial lockdown. Meanwhile, there is renewed discussion of reinstating lockdowns in communities that have seen sharp increases in new COVID-19 cases. To assess trends in loneliness as the COVID-19 pandemic unfolds and communities contemplate the risks and benefits of reopening or reinstating lockdown restrictions, we now report data from three separate large-scale assessments of loneliness collected monthly since the beginning of the initial shelter-in-place restrictions.

A total of 3,121 English speaking U.S. adults from all 50 states and the District of Columbia (18–84 years old; 54.2% female; 45.3% male) completed a set of online questionnaires including the UCLA Loneliness Scale-3 (Russell, 1996), and the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001), using the Amazon Mechanical Turk (MTurk) crowdsourcing platform. The opportunity to participate in the survey was advertised on the MTurk website and was open to anyone living within the U.S. All individuals were compensated for their time. The scales were administered cross-sectionally to three independent samples, approximately one month apart. Sample 1, published previously (Killgore et al., 2020), was collected between April 9–10, 2020 ($n = 1,012$; age = 36.1, $SD = 12.5$ years; 55.9% female). Sample 2 was collected between May 11–14, 2020 ($n = 1,037$; age = 35.9, $SD = 12.1$ years; 54.5% female). Sample 3 was collected between June 10–13, 2020 ($n = 1,070$; age = 35.3, $SD = 11.8$; 54.2% female). Reported annual household income did not differ between sample data collections, with 16.8% earning \$25,000 or less, 47.1% earning between \$25,000 and \$75,000, and 36.2% earning above \$75,000 per year. The proportion of

sample respondents from each state was compared against the proportion of U.S. population from each state (based on 2019 U.S. Census data). These proportions correlated highly with the census data ($r \geq .94$) and were closely matched to the population proportions, differing from the census data by <0.5% on average across the states on each administration. Thus, the sample can be considered representative of the regional population of the U.S. Participants provided informed consent prior to participation and the study was approved by the Institutional Review Board of the University of Arizona.

From April through June 2020, participants reported a clear decline in stay-at-home restrictions ($\chi^2 = 650.0$, $p < .00001$). In April, we found that 93.6% of participants reported that they were “sheltering-in-place” (Killgore et al., 2020), which declined to 78.8% by May, and dropped to 44.8% by June. With such a clear decline in social restrictions over the three-month period, we expected that loneliness would also decline accordingly. To the contrary, however, we found that loneliness scores significantly increased during this same time ($F_{2,3116} = 6.79$, $p < .001$, partial $\eta^2 = .004$). As evident in Fig. 1 (red lines), this observation was driven primarily by a significant increase in loneliness from April ($M = 43.8 \pm 13.5$) to May ($M = 45.4 \pm 12.8$; $p = .012$), with no significant change from May to June ($M = 45.7 \pm 13.0$).

Loneliness scores were also dichotomized into two groups based on published findings suggesting that ≥ 47 , out of a total score of 80, represents a higher than normal level of loneliness (Morahan-Martin and Schumacher, 2003). The percentage of participants exceeding this cutoff score for “high” loneliness increased significantly during the three-month period, from 43.0% in April to 49.7% in June ($\chi^2 = 10.34$, $p = .006$, blue bars). The increase in scores meeting the cutoff was significant from April to May ($p < .05$), but appeared to plateau from May to June.

Additionally, we compared the percentage of individuals meeting criteria for loneliness based on self-reported shelter-in-place status at each month. In April, there was no difference in the percentage of high loneliness between those sheltering in place (43.1%) versus those who were not (41.5%; $\chi^2 = 0.06$, $p = .808$). By May, however, a higher percentage of those reporting they were sheltering-in-place met criteria for high loneliness (49.8%), compared to those who reported they were not (42.3%; $\chi^2 = 3.95$, $p = .047$). This difference was even more pronounced in June, where 55.6% of those under lockdown/shelter-in-place met the

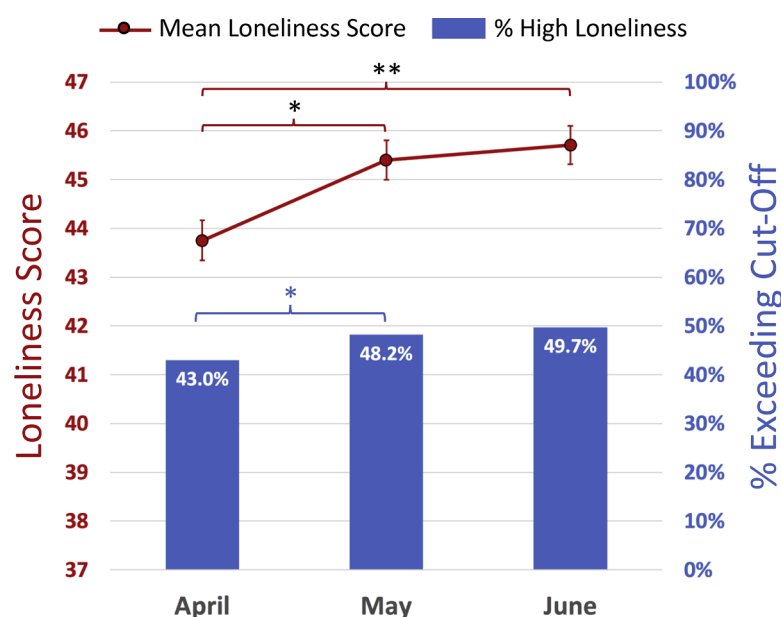


Fig. 1. Red Line: Mean loneliness scores increased significantly over three monthly assessments. Blue Bars: The percentage of participants exceeding the cut-off score for high loneliness increased significantly over the three monthly assessments. * $p < .05$, ** $p < .005$. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.).

higher loneliness criterion, compared to 44.7% of respondents who reported no such restrictions ($\chi^2 = 13.47$, $p = .0002$). Thus, we observed that overall loneliness scores increased over the first three months of the stay-at-home period of the COVID-19 pandemic despite many communities re-opening, with the greatest loneliness observed among those who were sheltering-in-place. We did not analyze the data by state or region at this time, but future work should examine whether increases in loneliness may differ by geographic regions where the coronavirus restrictions have persisted for particularly long periods of time.

We were also concerned that increased social isolation and loneliness during the pandemic may exacerbate mental health issues such as depression or suicide (Killgore et al., 2020). We therefore correlated loneliness scores with depression and suicidal ideation scores from the PHQ-9 at the same time points using Spearman's rho. Loneliness was positively correlated with depression at each assessment time point (April $\rho = .59$, May $\rho = .56$, June $\rho = .56$, all p -values $< .00001$). Similarly, loneliness scores were positively correlated with suicidal ideation at each observed time point (April $\rho = .42$, May $\rho = .40$, June $\rho = .39$, all p -values $< .00001$), even after controlling for other symptoms of depression. We conclude that current loneliness levels remain high relative to normative data collected years prior to the pandemic, are particularly elevated for those who remain under greater stay-at-home restrictions, and that high loneliness is a risk factor for depression and suicidal ideation.

The construct of loneliness is complex and it may have different causes and manifestations across individuals (Lim et al., 2020). Clearly, social isolation is one factor that increases loneliness in some people. Yet, we find that loneliness is also elevated even among those who report they are no longer under restrictions or sheltering-in-place. We speculate that this is because the “new normal” is not normal. Even in communities that have reopened, typical social interactions remain profoundly altered, as people maintain social distance, avoid congregating in groups, refrain from handshakes, hugs, and pats on the back, and wear masks that hide subtle facial expressions of emotion and muffle vocal intonations. Many of the social behaviors that have evolved for generations as ways to express closeness, friendship, and a

sense of community have been radically altered in the wake of the pandemic. There is no denying that staying at home alone can contribute to a sense of loneliness, but so can returning to a world where we remain awkwardly isolated in the presences of others. Consequently, increased loneliness is likely to remain prevalent for some time after communities reopen and attempt to return to normal. Moreover, as infection rates continue to rise in many areas, some regions again find themselves facing renewed restrictions or stay-at-home orders. Increased loneliness may be with us for a while. It is, therefore, imperative that the mental health community be prepared to competently address the growing problem of loneliness throughout the pandemic and its aftermath.

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Declaration of Competing Interest

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