

## Special Article

# Social Isolation and Loneliness Before and During the COVID-19 Pandemic: A Longitudinal Study of U.S. Adults Older Than 50

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## Abstract

**Objectives:** The potential impact of social distancing policies during the coronavirus disease 2019 (COVID-19) pandemic on social isolation and loneliness is of increasing global concern. Although many studies focus primarily on loneliness, patterns of social isolation—particularly physical and digital isolation—are understudied. We examined changes in social isolation, physical isolation, digital isolation, and loneliness in U.S. adults older than 50 before and during the lockdown.

**Methods:** Two waves of the Health and Retirement Study, a national panel sample of U.S. adults older than 50 years, were used. Fixed-effects regression models were fitted to identify within-person change from 2016 to 2020 to examine the impact of social distancing policies during the pandemic.

**Results:** There was an increase in physical isolation and social isolation among respondents during the COVID-19 social distancing policies. However, respondents experienced no change in digital isolation or loneliness. The increase in physical isolation was only present for people with high COVID-19 concern, whereas people with low concern experienced no change in physical isolation.

**Discussion:** Despite an increase in physical isolation due to the social distancing policies, U.S. adults aged older than 50 stayed connected through digital contact and were resilient in protecting themselves from loneliness.

**Keywords:** Digital isolation, Mental health, Social relationships, Social support

In March 2020, President Trump deemed the coronavirus disease 2019 (COVID-19) pandemic a state of emergency and urged Americans to “stay home” (White House, 2020). By early April, most states issued varying degrees of “stay-at-home” orders that mandated the practice of social distancing (Lee, 2020). Visiting older adults was explicitly discouraged due to their high risk of complications from COVID-19 (Centers for Disease Control and Prevention, 2020). Yet even before the outbreak, loneliness (i.e., perceived lack of meaningful relationships) and social isolation (i.e., lack of social interactions) among older adults

were seen as a public health crisis because they were widespread and associated with increased risk of morbidity and mortality (National Academies of Sciences, Engineering, and Medicine, 2020). Consequently, many have feared that social distancing policies will increase loneliness and social isolation, especially among older adults (Berg-Weger & Morley, 2020; Brooke & Jackson, 2020).

Despite these concerns, evidence of the effects of the pandemic on population mental health has been limited by the use of convenience samples and a lack of prepandemic baseline data against which to measure change within

individuals or across the population (Pierce, McManus et al., 2020). A few exceptions were found in the literature. An Austrian study used two different samples and found loneliness in adults aged 60 and older increased slightly from 2019 to 2020 (Heidinger & Richter, 2020). A Dutch study compared two waves of panel data and found an increase in loneliness among adults aged 65 and older during the pandemic using a *t*-test (van Tilburg et al., 2020). A U.S. study found a slight increase in older adults' loneliness from 2019 to 2020 using about 100 respondents (Krendl & Perry, 2020). Another U.S. panel study of adults aged 65 and older found no change in loneliness between January and April 2020 using analysis of variance (Luchetti et al., 2020). Although these longitudinal studies provide insight into mean changes in loneliness before and during the pandemic, they relied on simple statistical methods that are vulnerable to confounding effects. Thus, a representative panel study of within-person changes in loneliness that accounts for time-invariant confounders is needed to reach a more convincing conclusion about the social impact of COVID-19.

Social isolation, another independent risk factor for morbidity and mortality (Holt-Lunstad et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2020; Steptoe et al., 2013), is less studied. A Canadian study, which used a convenience sample, found social isolation has not changed during the pandemic (Folk et al., 2020). It is possible that COVID-19 has differential effects on physical isolation (i.e., lack of face-to-face contact) and digital isolation (i.e., lack of phone calls, e-mail/texting, and social media). Although people may experience increased physical isolation due to social distancing, they may be able to compensate by increasing their digital contact with others. Therefore, a nuanced investigation of social isolation, including physical and digital isolation, is much needed.

Given the heterogeneity in the influence of COVID-19 on different groups (Drefahl et al., 2020), certain individuals may be more vulnerable to changes in social isolation and loneliness during the pandemic. Studies found women, younger people, people with higher COVID-19 concerns, and people with chronic conditions had a higher increase in mental health problems and loneliness than their counterparts during the pandemic (Luchetti et al., 2020; Pierce, Hope et al., 2020; van Tilburg et al., 2020). Therefore, it is important to investigate heterogeneities (age, gender, race, education, instrumental activity of daily living [IADL], and COVID-19 concern) in the influence of COVID-19 on loneliness and social isolation.

Using two waves of the Health and Retirement Study (HRS), our first goal was to investigate the effects of social distancing policies on loneliness and social isolation (including physical and digital isolation) using fixed-effects models. We also sought to identify groups that are more vulnerable to loneliness and social isolation. Therefore, we examined possible moderators that alter the association between COVID-19 and social isolation/loneliness.

## Method

### Study Design and Participants

Participants were drawn from the HRS, a nationally representative biennial panel study of Americans older than 50 years (Sonnegga et al., 2014). The first participants enrolled in 1992 and additional participants are enrolled every 6 years to maintain a representation of the older population. The COVID-19 module of HRS 2020 is being administered to the 50% random sample of HRS. Fieldwork on this sample commenced on June 11, 2020 and is still underway. The response rate was 62% at the time this data set was created. The 2020 sample also received a mail-in self-administered questionnaire (SAQ), which contained questions on loneliness and social isolation.

The 2020 half sample had previously been invited to complete an SAQ in 2016. Data from 2016 and 2020 were combined to form a sample of respondents who completed SAQ before and during the pandemic. We include 1,141 respondents who were at least 50 years old in 2020 and returned the SAQ at both waves.

### Measurements

*Loneliness* was measured by the 11-item scale derived from the Revised UCLA Loneliness Scale (Russell, 1996). All questions were scored on the following scale: 1 (*Hardly ever or never*), 2 (*Some of the time*), 3 (*Often*);  $\alpha = 0.88$ .

We created a *social isolation index* by assigning one point if the respondent (a) did not live with a partner/spouse, had less than monthly contact (less than weekly contact was used as a cut-point for social isolation as sensitivity analysis and no substantial difference was found in results; including face-to-face or digital) with (b) children, (c) family members, or (d) friends; and (e) did not participate in social groups such as volunteering, social/sports clubs, nonreligious organizations, community arts group, or church (Ertel et al., 2008; Steptoe et al., 2013). Scores ranged from 0 to 5 with higher scores indicating greater social isolation. We further divided the social isolation index into physical isolation and digital isolation. *Physical isolation* was measured by assigning one point if the respondent did not live with a partner/spouse, had less than monthly face-to-face contact with children, other family members, and friends, and did not participate in social groups. Scores ranged from 0 to 5. *Digital isolation* was measured by assigning one point if the respondent had less than monthly digital contact (telephone, written/e-mail contact, or social media) with children, other family members, and friends. Scores ranged from 0 to 3.

*Instrumental functional limitation* was measured by five items of the IADL scale (Lawton & Brody, 1969). These items included meal preparation, grocery shopping, making phone calls, taking medicine, and managing money. We dichotomized the scale such that respondents received a score of 1 if they had difficulty performing at least one of the five

IADLs and a score of 0 otherwise. COVID-19 concern was measured by a question: “How concerned are you about the coronavirus pandemic?” The response ranged from 1 (least concerned) to 10 (most concerned). Demographic variables were extracted on gender (0 = women, 1 = men), age (years), race (White, Black, and Other), and education (years).

**Analysis**

We used fixed-effects regression to estimate within-individual changes of social isolation and loneliness. Ideally, we would compare a person who experienced the pandemic in 2020 to the same person who did not experience the pandemic at the same time. Because this counterfactual is unobservable, we instead employed time fixed-effects models (Allison, 2009), which compare a person who experienced the pandemic in 2020 with the same person in the 2016 prepandemic. This technique removes the unobserved, time-invariant variables (e.g., demographics, genetics). IADL was included in the models to adjust for the effect of change in IADL on change in social isolation and loneliness.

Interaction terms between time and six covariates (age, gender, race, education, IADL, and COVID-19 concern) were entered in fixed-effects models to investigate whether certain individuals were more susceptible than others to changes in social isolation and loneliness during the pandemic. Significant interactions ( $p < .05$ ; two-sided) indicate heterogeneity in the effect of the pandemic.

Analyses were conducted using Stata 16. All covariates had less than 1% missing data. Respondents with missing values were excluded from the analysis. We used Stata’s svy command to account for complex survey design. HRS

survey weights were used, which adjusted for unequal selection probabilities and differential nonresponse to the COVID-19 survey.

**Results**

Table 1 displayed that respondents, on average, were 67 years old, mostly White, had 14 years of education, had a little functional limitation, experienced a low level of loneliness, and were highly concerned about COVID-19. *t*-Tests indicated no change in social isolation, digital isolation, or loneliness between time points. There was, however, an increase in physical isolation.

The fixed-effects models showed that respondents experienced no change in loneliness ( $b = 0.00$ , 95% confidence interval [CI] =  $-0.02$  to  $0.03$ ) from 2016 to 2020 (Figure 1). There was, however, an increase in social isolation ( $b = 0.10$ , 95% CI =  $0.04$  to  $0.16$ ). Specifically, there was an increase in physical isolation ( $b = 0.16$ , 95% CI =  $0.08$  to  $0.23$ ), but no change in digital isolation ( $b = 0.03$ , 95% CI =  $-0.03$  to  $0.08$ ).

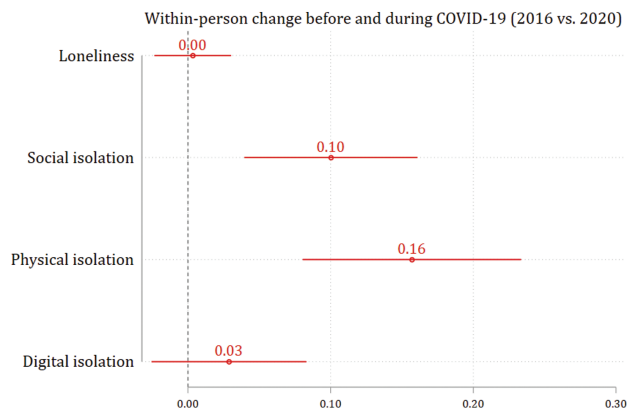
Six interaction terms (age, gender, race, education, IADL, and COVID-19 concern interacted with time) were entered in separate fixed-effects models to investigate heterogeneity in the patterns of change in the outcome measures. The only statistically significant interaction was between COVID-19 concern and time. This model indicated that people with higher COVID-19 concern had a greater increase in physical isolation (Figure 2).

In addition, we conducted interaction analysis and showed that people with the highest levels of digital isolation experienced a significant increase in loneliness, whereas people with lower levels of digital isolation experienced no increase in loneliness (Supplementary Appendix Figure A1).

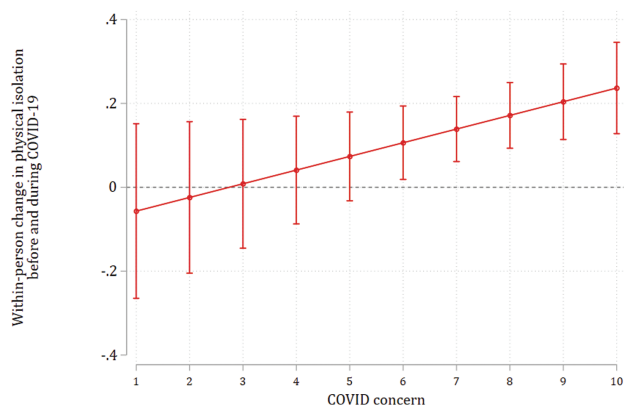
**Table 1.** Descriptive Statistics of 2016 and COVID-19 Survey of HRS ( $N = 1,141$ )

	2016		2020		Range	<i>t</i> -test
	Mean	SD	Mean	SD		
Social isolation	0.89	0.97	1.00	1.00	0–5	1.75
Physical isolation	1.65	1.16	1.80	1.20	0–5	2.25*
Digital isolation	0.62	0.79	0.65	0.79	0–3	0.66
Loneliness	1.50	0.45	1.50	0.44	1–3	0.33
Age	63.12	7.46	66.87	7.46	51–101	
Race					0–1	
White	0.84		0.84			
Black	0.09		0.09			
Other	0.07		0.07			
Men	0.47		0.47		0–1	
Education	13.79	2.64	13.79	2.64	0–17	
IADL	0.11	0.32	0.12	0.32	0–1	
COVID-19 concern			7.57	2.56	1–10	

Notes: COVID-19 = coronavirus disease 2019; HRS = Health and Retirement Study; IADL = instrumental activity of daily living. Sample sizes are true (unweighted). Mean and standard deviation (SD) are weighted, adjusting for complex survey design and nonresponse. \* $p < .05$ .



**Figure 1.** Fixed-effects models predicting within-person change in social isolation and loneliness before and during COVID-19 (2016 vs. 2020). COVID-19 = coronavirus disease 2019.



**Figure 2.** Interaction plot between time and COVID concern in fixed-effects models predicting within-person change in physical isolation before and during COVID-19 (2016 vs. 2020). COVID-19 = coronavirus disease 2019.

## Discussion

This study is among the first representative analyses to offer a within-person comparison regarding the effect of U.S. social distancing policies during COVID-19 on social isolation and loneliness. Since the beginning of the pandemic, there have been significant concerns that social distancing would lead to increases in loneliness (Berg-Weger & Morley, 2020). Contrary to expectations, we found no change in loneliness during the pandemic among U.S. adults aged 50 and older. This is inconsistent with other U.S. studies that showed a slight increase in loneliness during the pandemic (Krendl & Perry, 2020; McGinty et al., 2020). However, many of these studies were limited in their ability to represent a general trend. For example, Krendl and Perry (2020) used a sample of roughly 100 older adults, whereas McGinty et al. (2020) used two separate samples from 2018 and 2020 to estimate the change in loneliness. Meanwhile, a large panel study of older Americans found no mean changes in loneliness between January and April 2020 (Luchetti et al., 2020)—a finding consistent with our own. Compared to previous

studies, we employed fixed-effects models based on nationally representative panel data to adjust for any unobserved, time-invariant variables (e.g., demographics, personality, and genetics). Therefore, our findings offer stronger evidence regarding the effect of social distancing on loneliness.

Although previous studies focused primarily on loneliness among older adults (Krendl & Perry, 2020; Luchetti et al., 2020; McGinty et al., 2020), social isolation is more likely to be an immediate result of social distancing policies. Furthermore, understanding changes in loneliness (or lack thereof) cannot be achieved without investigation of social isolation. To fill this knowledge gap, we examined changes in overall social isolation, physical isolation, and digital isolation before and during COVID-19. We found that HRS respondents experienced increased social isolation. We further divided social isolation into physical and digital isolation to understand the role of digital contact in the era of social distancing. We found that there was an increase in physical isolation but no change in digital isolation. This implies that COVID-19 social isolation is largely driven by physical isolation, not digital isolation. Ultimately, our findings suggest that despite experiencing increases in physical isolation due to social distancing policies, older Americans managed to maintain stable levels of digital contact and loneliness during the COVID-19 pandemic.

Given the increasing prominence of digital contact, it is not surprising that scholars emphasized the important role of digital interactions in reducing loneliness (Fakoya et al., 2020; Peng et al., 2018). Consistent with this claim, we found that although there was no mean change in loneliness before and during the pandemic, people who had limited digital contact with family, friends, or children experienced an increase in loneliness. This finding provides evidence that digital interactions are possible intervention targets for reducing loneliness.

While the general trend of loneliness and social isolation undeniably has public health consequences, it is crucial to consider how certain individuals may be unequally affected by the pandemic (Pierce, Hope et al., 2020). To this end, we sought to identify groups that are more vulnerable to loneliness and social isolation due to social distancing. Contrary to our expectation, we did not find any group differences on the basis of socioeconomic or health characteristics. This is surprising given that men, ethnic minorities, the oldest-old, and individuals with lower education and preexisting health conditions are all at greater risk of dying from COVID-19 complications (Drefahl et al., 2020; Jordan et al., 2020). We did, however, find that people who were more concerned about COVID-19 (i.e., >5 of 10) became more physically isolated between time points, whereas people who were less concerned experienced no change in physical isolation. This indicates that individuals with little COVID-19 concern exercised fewer precautions that isolate them from others. Taken together, it seems that

physical isolation during the pandemic is mostly driven by COVID-19 concern.

Although the HRS provides a high-quality probability sample, response to the COVID-19 wave questionnaire is about 62% for this early release and the data collection is ongoing, which could have introduced bias. Nonresponse for the COVID-19 wave was addressed via survey weights, but attrition remains a potential source of bias. Because the respondents are generally nonimpaired, younger, and predominantly White, we caution against generalizing findings to other groups, specifically minorities who are disproportionately affected by COVID-19.

Overall, we found that despite reporting increases in physical isolation, the HRS respondents experienced no change in digital isolation or loneliness. Furthermore, we found that increases in physical isolation were only present for people with high COVID-19 concern.

## Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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## Conflict of Interest

None declared.

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## Author Contributions

S. Peng planned the study and wrote the paper. A.R. Roth helped to plan the study and contributed to revising the paper.

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