Who Stays Physically Active during COVID-19? Inequality and Exercise Patterns in the United States

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Abstract
Exercising is crucial to keeping up physical and mental health during the coronavirus disease 2019 (COVID-19) pandemic. In this visualization, the authors consider how existing social inequalities may create unequal physical exercise patterns during COVID-19 in the United States. Analyzing data from a nationally representative Internet panel of the University of Southern California Center for Economic and Social Research Understanding Coronavirus in America project (March to December), the authors find that although all Americans have become physically more active since the outbreak, the pandemic has also exacerbated the inequality in physical exercise. Specifically, the authors show that the gaps in physical exercise have widened substantially between men and women, whites and nonwhites, the rich and the poor, and the educated and the less educated. Policy interventions addressing the widening inequality in physical activity can help minimize the disproportionate mental health impact of the pandemic on disadvantaged populations.

Keywords
COVID-19, gender, race, SES, exercise inequality

The coronavirus disease 2019 (COVID-19) pandemic has posed an immense threat to public mental health worldwide. Individuals may worry about the well-being of loved ones, fear getting sick, experience stress about losing their income, and feel emotionally isolated, insecure, bored, and confused. For this reason, the World Health Organization (2020) has encouraged individuals to remain physically active during the COVID-19 pandemic through its #HealthyAtHome initiative. Indeed, physical activities have become especially important during the pandemic, as they can help reduce the risk for depression and help individuals remain mentally or emotionally healthy (e.g., Chen et al. 2020; Mammen and Faulkner 2013).

However, because of the pandemic, physical exercise routines can be disrupted. First, many people around the globe are requested to practice social distancing or stay at home to self-isolate. Second, to avoid contact with other people to help prevent the spread of the disease, places such as fitness centers and parks where people are normally active may have also been temporarily closed. On the contrary, changes to working and schooling hours because of the pandemic, and public awareness of its mental health impact, may lead to an increase in exercise participation.

Furthermore, not everyone can stay physically active during the pandemic. In fact, inequality in exercise was found to be widespread before the pandemic. For example, using data from the National Survey of Midlife Development in the United States, Grzywacz and Marks (2001) showed that women are often less physically active than men across age groups because of their gender roles and responsibilities, blacks are less active because they often live in less safe neighborhoods and have more functional health problems, and individuals of lower socioeconomic status (SES) are less physically active than their counterparts. These unequal physical activity patterns can be particularly prominent in times of crisis. During the COVID-19 pandemic, many women may need to take care of their children as schools are closed, and care for elderly family members who are self-isolating, while also fulfilling their work responsibilities as employees. Black Americans, who are more likely to live in disadvantaged neighborhoods with poor living conditions, may have limited space to exercise. Individuals of lower SES may be laid off and thus need to work multiple temporary jobs.

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jobs to make ends meet. Hence, the COVID-19 pandemic can exacerbate the existing inequality in physical exercise.

Thus far, evidence-based evaluations of public exercise patterns during the pandemic remain limited. This lack of evidence may hamper the allocation of resources that are vital to vulnerable populations that are most affected by the pandemic. In this visualization, we explore (1) how frequently individuals have been exercising since the outbreak and (2) how existing inequalities surrounding gender, race, and SES (in terms of income and education) may affect unequal exercise patterns during the pandemic.

We use data from the University of Southern California Center for Economic and Social Research Understanding Coronavirus in America tracking survey (specifics about the survey design and methodology are available at https://covid19pulse.usc.edu). This longitudinal survey has assessed a nationally representative sample of Americans’ attitudes and behaviors around the pandemic since March 2020. The first wave of the survey was fielded from March 10 to March 31. Since April 1, a new wave of the survey has been fielded every two weeks. The final sample we analyze includes 110,109 data points, tracking 7,976 individuals over 18 survey waves from March to December. The panel design of the data as well as our temporal analysis help better establish the effect of the pandemic on unequal exercise patterns (see also Wu, Qian, and Wilkes forthcoming). Measures and descriptive statistics of key variables in the analysis can be found in the supplementary information (e.g., SI Table 1). Figure 1 provides a visualization of our main findings.

Surprisingly, the pandemic has led to a substantial increase in physical exercise. In March, Americans reported that the average number of days in the past week on which they exercised was 2.06. This number went up to 3.7 in April and has remained relatively stable since then. To ensure that the increase in physical activity is due to the pandemic, we conduct additional analysis using data from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS survey includes the question “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?” We find that in 2019, before the pandemic, about 73 percent of Americans said that they participated in some physical activities or exercise in the past 30 days. In comparison, during the pandemic in 2020, data from the Understanding Coronavirus in America tracking survey show that 83 percent of Americans indicated that they had exercised for 1 or more days during the past 7 days, and 76
percent of Americans indicated that they had gone outside to walk, hike, or exercise in the past 7 days.

Americans are also physically more active during months with warm weather (e.g., June and July). To ensure that the increase in physical activity is not due solely to changes in seasonal weather, we compare the exercise pattern, month by month, between 2019 and 2020 (see SI Figures 2A and 2B). We find that although in the early stages of the pandemic (e.g., March 2020), the level of exercise participation was lower than that in March 2019 (because of the shorter time frame), the pattern was reversed in April and afterward (despite the shorter time frame). The significant increase in the amount of physical activity and the relative gaps between the two different years as well as across months year round demonstrate that there is indeed a positive pandemic effect on exercise participation.

More importantly, Figure 1 shows that the pandemic has exacerbated the inequality in physical exercise. In March (wave 1), the gaps in physical exercise between men and women and between university-educated and less educated respondents were small. Similarly, the gaps in physical exercise among racial categories and among income groups do not seem to be significant. However, since April (waves 2–18), the gaps in physical exercise have widened substantially between men and women (Figure 1A), whites and non-whites (Figure 1B), the rich and the poor (Figure 1C), and the educated and the less educated (Figure 1D).

This data visualization shows that although all Americans have become physically more active since the outbreak, the pandemic has also exacerbated the inequality in physical exercise. Our additional analysis shows that individuals who exercise more frequently during the pandemic report more favorable mental health (SI Table 2). Hence, policy interventions addressing the widening inequality in physical activity can help minimize the disproportionate mental health impact of the pandemic on disadvantaged populations.

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**Supplemental Material**

Supplemental material for this article is available online.

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