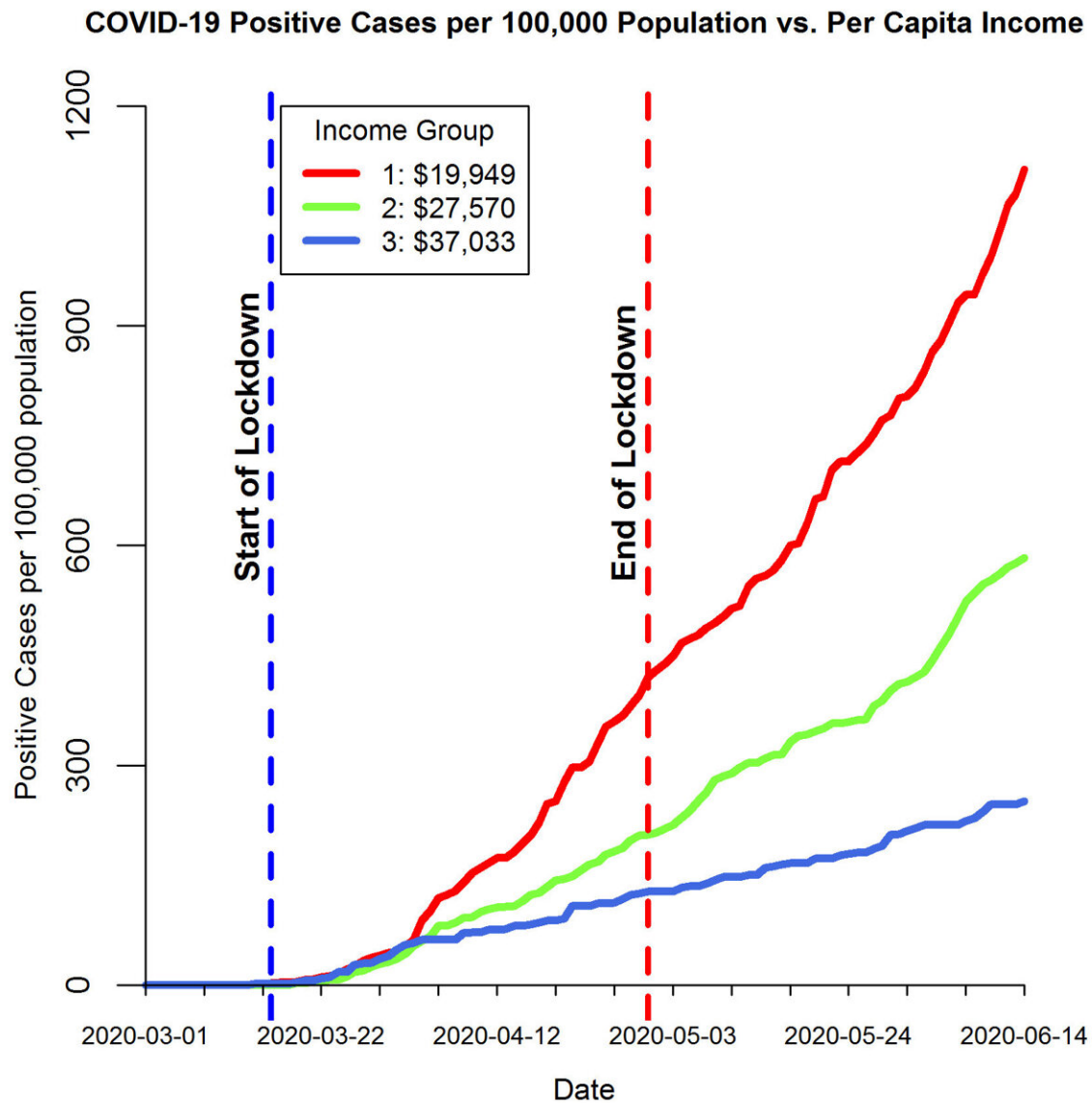


How society's inequalities showed up in COVID outcomes

August 9 2021



COVID-19 cases for each per capita income, zip code group of Salt Lake County, Utah (USA) between 17 February and 12 June 2020. The dashed vertical lines show the start (blue) and end (red) of lockdown directives. The color scale ranges from red (lowest income to highest income). Credit: Daniel Mendoza

Racial minorities comprise around a quarter of Utah's population but represent a third of COVID-19 cases in the state. A similar story has played out across the country. Why have racial minorities been unequally affected by the COVID-19 pandemic?

Researchers are still working out the answer to this question, but a new study from University of Utah researchers including Daniel Mendoza and Tabitha Benney explores the hypothesis that variation in income and occupational status, on a neighborhood-by-neighborhood scale, may be the reason. During the 2020 lockdowns, residents of affluent areas in Salt Lake County, Utah were able to stay at home more than residents of the least affluent zip codes, suggesting that the "essential worker" occupations of the least-affluent areas, which are also the highest minority populations, placed them at greater risk for contracting COVID-19. Subsequently, the least-affluent zip codes experienced nearly ten times the COVID-19 incidence rate of affluent areas.

"We were shocked at the nearly tenfold difference in contagion rate increase when comparing the groups we had defined," Mendoza says. "I think it was a very sobering moment when we realized how deep the disparities truly were in our own backyard."

The study is published in the journal *COVID*.

Salt Lake County's disparities

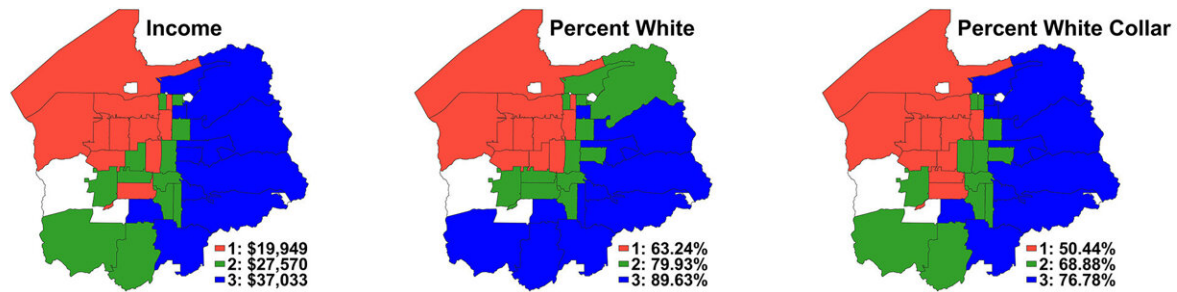
Two factors make Salt Lake County an ideal site for exploring the link between inequality and COVID-19 infection. First, says Benney, an associate professor of political science, a dense network of traffic sensors produces extraordinarily detailed traffic and mobility data, organized by zip code. Pair that with a similarly detailed level of COVID-19 incidence rates and demographic, occupational and income data, and a high-resolution picture emerges.

Second, says Mendoza, a research assistant professor in the Department of Atmospheric Sciences and visiting assistant professor in the Department of City & Metropolitan Planning, Salt Lake County exhibits "strongly marked socioeconomic disparities. The substantial differences in race, income and occupation are very clear and provide a strong basis for inequality analysis."

The divide in Salt Lake County roughly follows the I-15 freeway, which separates the county into east and west sides. The east side has a higher per capita income and percentage of white-collar workers. The divide isn't strictly racial, however, with a more diverse northeast and less diverse southwest quadrant of the valley.

But with COVID-19 overlain onto this socioeconomic landscape, a pattern emerged.

"The first time our team crunched the numbers," Benney says, "we were all dismayed to see how well income and occupation related to COVID incidence rates."



Geographic Distribution of 2020 (left to right) per capita income, percent white, and percent white-collar group for each zip code of Salt Lake County, Utah. The color scale ranges from red (least affluent, least percent white population, lowest percent of white-collar workers) to blue (most affluent, highest percent white population, highest percent of white-collar workers). Zip codes not considered in the study are shown in white. Credit: Daniel Mendoza

What is structural inequality?

How does income and occupation relate to race? The researchers explored that question through the lens of structural inequality, which is a system of privilege in institutions and policies that place people on an unequal starting footing in society. This inequality, the researchers write, "create[s] relational patterns that effectively socialize and dictate how individuals see the world and their place in it. Inequality is considered structural when policies produced by the system keep some groups from getting ahead, regardless of their actions."

In the first few months of the COVID-19 pandemic, as white-collar office workers and others stayed home, those deemed 'essential' workers still journeyed out to keep hospitals running, grocery store shelves stocked and packages moving around the country. In this case, the structural inequalities at work would be those that placed [racial minorities](#) disproportionately into lower-income occupations, and thus

disproportionately into the category of blue-collar worker least likely to be able to stay home during the initial lockdown.

"The true front-line workers were far more varied than expected," Benney says. "Medical workers are the heroes for sure, but janitors, repair people and folks that kept our homes and our families healthy throughout the pandemic were, and may again, be facing greater risks due to their starting point in life and the occupation they have today."

The evidence for the unequal effect of lockdowns on different occupations and incomes comes from traffic data collected between February and June 2020—before, during and after the main lockdown phase of the pandemic. Traffic decreased in zip codes with high percentages of high-income, white-collar and white residents by up to 50%. But in the least affluent zip codes, traffic decreased by only around 15%.

Statistical correlations linked those traffic patterns to income, occupation and, eventually, to COVID-19 outcomes.

"Income and occupation go hand in hand much more so than race and either of the variables," says Mendoza, who also holds appointments as an adjunct assistant professor in the Pulmonary Division at the School of Medicine and as a senior scientist at the NEXUS Institute. In a place like Salt Lake County, structural inequalities can lead to income and occupational divides falling along racial lines.

Benney says that policies such as lockdowns, which expose some populations to higher disease risk, need to be better designed and implemented in future waves of the current pandemic and beyond. "In this case, because more affluent communities were more likely to stay home under the Stay-Home-Stay-Safe Directive in Utah, this behavior appears to have shifted the disease risk away from the wealthiest, most

white, and white-collar workers, who were already more likely to rebound from a crisis," she says. While Utahns benefitted overall from the directive, she adds, designing this policy with low income, essential workers in mind may help prevent the spread of disease, improve outcomes for vulnerable populations, and create a more resilient society overall.

Facing successive waves

Since the end of the study period in June 2020, the COVID-19 pandemic has continued with a surge in winter 2020-21, the rollout of vaccines and the growing impact of the Delta variant. Both Mendoza and Benney emphasize the need for policymakers to consider vulnerable populations, including those from low-[income](#) zip codes, in crafting a pandemic response.

"Frankly, we should be showing our support for these people by masking up in public, getting vaccinated, and looking out for our community in any way we can," Benney says.

"Our hope is that our research provides insight into the most vulnerable and affected groups and we can pay attention to their specific needs and take care of them as they take care of the rest of us," Mendoza adds.

More information: Daniel L. Mendoza et al, The Role of Structural Inequality on COVID-19 Incidence Rates at the Neighborhood Scale in Urban Areas, *COVID* (2021). [DOI: 10.3390/covid1010016](https://doi.org/10.3390/covid1010016)

Provided by University of Utah

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