

50 years after being outlawed, redlining still drives neighborhood health inequities

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Decades of redlining—a longstanding banking practice that blocked people of color from getting mortgages—continue to perpetuate racial and socioeconomic inequality in the San Francisco Bay Area and across

the country, according to ongoing research from UC Berkeley School of Public Health.

Although the practice has been illegal since 1968, multiple studies show that redlining's harmful legacy has left nonwhite communities struggling with [air pollution](#), reproductive [health](#) disorders, and fewer urban amenities more than 50 years later.

"Historical mortgage redlining, one of the many policies designed to uphold structural racism through housing discrimination, has lasting consequences," said Xing Gao, a doctoral candidate in epidemiology at Berkeley Public Health who studies the relationship between urban environments and health. "This holds implications for future policy-making to center equity and justice when it comes to housing."

Redlining dates back to the midst of the Great Depression, when the [federal government](#) created the Home Owners' Loan Corporation to provide assistance to homeowners who were defaulting on their mortgages. Bankers assessing financial risk created maps that shaded neighborhoods in accordance with their property values and racial make-up.

Communities with a higher proportion of nonwhite residents were deemed inherently risky —and outlined in red. This discriminatory system was widespread and prevented nonwhite residents from obtaining mortgages. It created generations of injustice as many White Americans built home equity that they could pass down to their children while most nonwhite Americans could not.

Worse air, water, noise pollution

Those currently living in historically redlined neighborhoods are highly vulnerable to air, water, and noise pollutants and other health problems,

according to research from UC Berkeley and elsewhere.

In 2022, while still working as a postdoctoral researcher, Dr. David J.X. González and his team found that residents in previously D-graded neighborhoods lived in proximity to [nearly twice the density of oil and gas wells](#) as those in formerly A-graded areas.

González, who is now an assistant professor in the BPH Division of Environmental Health Sciences, also found that living near oil and gas wells exposes residents to numerous pollutants that can cause cardiovascular disease, impaired lung function, anxiety, depression, and [preterm birth](#).

"Our study adds to the evidence that structural environmental racism contributed to the disproportionate siting of oil and gas wells in racially and socially marginalized neighborhoods," the study authors wrote.

Because over [60% of previously D-graded communities](#) remain nonwhite, people of color are disproportionately exposed to greater levels of air pollution despite overall improvements in air quality across the country, according to another 2022 paper written by UC Berkeley researchers, including Rachel Morello-Frosch and Josh Apte, and published in *Environmental Science and Technology Letters*.

The paper revealed that harmful pollutants are over-represented in these C- and D-graded neighborhoods, thereby placing millions of people at risk.

The authors conclude that "present-day disparities in U.S. urban pollution levels reflect a legacy of structural racism in federal policy-making—and resulting investment flows and land-use decisions—apparent in maps drawn more than 80 years ago."

Less green space

Access to parks, trees, and gardens in urban areas can potentially help reduce stress and improve well-being. However, studies have found that racially segregated neighborhoods are less likely to have access to such green spaces and are more likely to experience noise pollution, [poorer air quality](#), and lower incomes.

[A 2017 study led by former UC Berkeley environmental health scientist Joan Casey](#) found that census tracts with a higher proportion of racial and ethnic minorities had less green space than those with fewer minorities.

Using [satellite imagery](#), the team examined how green space changed over time in neighborhoods from 2001 to 2011. The results were definitive and corroborated prior research; not only did green areas decrease over the studied decade in predominantly nonwhite communities, there was also less of it to begin with.

Dr. Anthony Nardone, a UC Berkeley and UCSF joint medical student at the time, took his findings a step further in a 2021 study and used HOLC maps to assess greenspace in historically redlined neighborhoods. Nardone and his colleagues used satellite imagery from 2010 and the normalized vegetation index (NDVI) to measure greenness using census data and redlined maps from the Mapping Inequality Project.

Nardone said that researchers began the study after completing related work examining asthmatic and [birth outcomes](#) associated with redlining, according to [Environmental Health Perspectives](#).

"When we were hypothesizing the reasons as to why current outcomes are worse in these places today, one of the things that kept coming up was just the actual physical built environment," Nardone told the

journal.

Nardone's results confirmed that green space declined alongside HOLC grades and that many areas historically designated as "less desirable" were covered in more asphalt and lacked trees and parks. The strongly held belief that racial heterogeneity was detrimental to property values—and therefore residential communities—was a key contributing factor to decades of neighborhood disinvestment in redlined areas, Nardone and his co-authors wrote.

Attempts by the federal government and financial institutions to maintain [racial segregation](#) were not unique to the Home Owner Loan Corporation, and instead such segregation was "a widely held policy in federal bodies," the authors continue. The Federal Housing Administration, for example, intentionally failed to accept insurance policies for mortgages that would have desegregated certain neighborhoods, according to the 2021 study.

Despite the study's limitations—urban areas were observed across just four months and quality of [green space](#) was not measured—the results represent a substantial step forward in the literature to understanding redlining's continuing socioeconomic impacts.

Negative outcomes for women's reproductive health

Years of economic neglect from redlining has long term consequences for women's reproductive health, too. Berkeley Public Health researchers have helped pioneer research into the effects of early housing policy decisions on birth outcomes.

Their work has found that low birth weight, preterm birth, and other troubling outcomes are associated with [socioeconomic deprivation](#)—an attribute far more likely in historically redlined areas. Irene Headen, a

former doctoral epidemiology student and postdoctoral researcher at Berkeley Public Health, found a positive relationship between gestational weight gain and neighborhood deprivation— or few economic, educational, and housing resources—[in a 2018 study](#).

Nardone strengthened these findings two years later. Using data from the California Office of Statewide Health and Planning and Development, his team examined preterm birth, low birth weight, perinatal mortality, and small-for-gestational age deliveries in Los Angeles, Oakland, and San Francisco. Alongside Dr. Mahasin Mujahid, chair of the Berkeley Public Health Division of Epidemiology, Nardone determined that adverse birth outcomes were related to worsening HOLC grades.

This past fall, doctoral candidate Gao studied severe maternal morbidity—life-threatening pregnancy complications before or after delivery—in redlined neighborhoods. Prior studies had shown that the built environment is a significant determinant of reproductive health but research had not yet made the connection with severe maternal morbidity.

"We wanted to take a step back and examine the sociopolitical mechanisms that produced the differential neighborhood social and material conditions in the first place," Gao said. She added that by considering issues such as housing discrimination and segregation in their analysis, her colleagues would be able to address racial inequities in severe maternal morbidity.

Gao studied roughly 24,500 cases of severe maternal morbidity across eight different California cities, from the San Francisco Bay Area to San Diego between 1997 and 2017, using census tract-level HOLC maps. Black and Hispanic residents in historically D-graded neighborhoods showed greater risk of the illnesses than other racial groups.

Discriminatory lending practices continue to have devastating effects on low-income and people of color nearly 100 years after the first redlined maps were created by the Home Owners' Loan Corporation in 1933.

Residents in historically D-graded neighborhoods are highly susceptible to serious health complications such as cardiovascular disease and maternal morbidity due to decades of strategic disinvestment.

Without considerable intervention to supply cleaner air, access to parks, and other environmentally enriching amenities to vulnerable communities, this trend is likely to continue. Further research into past and present discriminatory housing practices are thus the beginning of addressing racial inequities in public health.

Provided by University of California - Berkeley

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