

Noise pollution loudest in black neighborhoods, segregated cities

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As the number of white residents in a neighborhood declines, noise rises. But noise pollution is inescapable in segregated cities, where noise pollution is worse for everyone, according to the first breakdown of noise exposure along racial, ethnic and socioeconomic lines in the United States.

The study led by the University of California, Berkeley is the first to examine [noise](#) pollution nationally through the lens of racial disparities and the extent to which noise is exacerbated by living in segregated cities. The study does not examine how noise pollution is linked to health, but previous studies have shown that noise pollution is linked to acute health problems such as high blood pressure and loss of sleep.

"We've known that poor communities and communities of color are likely more exposed to toxic landfills and [air pollution](#), but until now we really have not heard much about noise pollution," said the study's lead author, Joan Casey, a postdoctoral scholar in the Berkeley School of Public Health. "The consistent disparities in noise pollution across domains in our study surprised us."

The study will be published July 25 in the journal *Environmental Health Perspectives*. The research was funded by the Robert Wood Johnson Foundation and the National Cancer Institute. Casey works in the lab of Berkeley professor and study co-author Rachel Morello-Frosch, whose research has extensively examined racial, ethnic and economic disparities in exposure to environmental pollutants.

The scientists used noise data collected by the National Park Service. Noise-monitoring devices across the continental United States recorded 1 million hours of sound over a 13-year period ending in 2013. Based on the data, Berkeley and Harvard University researchers estimated the [noise levels](#) in metropolitan areas across the continental U.S. on a neighborhood-scale—areas with 600 to 1,300 residents, on average.

The noise levels used in the study are an estimate of the cumulative amount of noise on an average summer day in a given location. The research does not differentiate between sources of noise pollution, but major sources of noise commonly include industrial activity, traffic and airports.

Noise was quantified by the level that is exceeded in a place 50 percent of the time. For example, a noise level of 50 decibels in a neighborhood means that 50 percent of the time noise in this neighborhood is louder than 50 decibels. Noise is measured logarithmically, so a 3-decibel increase is a doubling of the sound energy. Previous research has shown that for every 5.5-decibel increase in sound energy in a neighborhood, the proportion of residents saying they are really annoyed about noise doubles.

"Noise pollution is an in-your-face form of pollution," Casey said. "People are definitely aware even if they are exposed to low levels of noise."

The researchers found a strong correlation between noise and race. The researchers looked at how noise levels correlated with the demographics of neighborhoods across the country, focusing on five racial and ethnic groups: Asians, blacks, Hispanics, Native Americans and non-Hispanic whites. The study found that noise pollution tends to be higher as the percentage of white residents in a neighborhood declines.

On average, as the proportion of residents that were Asian, black or Hispanic rose, noise levels both during the day and during night were higher. For Native Americans, the data showed the inverse, which could be due to the remote locations of Native American reservations.

The study found that neighborhoods with at least 75 percent black residents had median night-time noise levels 4 decibels higher than in neighborhoods without any black residents. The difference in noise levels between predominantly white and predominantly black neighborhoods was the largest of all races and ethnicities studied.

Neighborhoods with high levels of poverty and low levels education had high levels of noise. One exception was in urban neighborhoods with a high median annual income, which also had high levels of noise pollution.

Another major finding of the study was that white residents in segregated metropolitan areas were exposed to higher levels of noise pollution than white residents in less segregated cities. In other words, if you're a white person living in a more segregated [city](#), you may hear more noise than your white counterparts in a less segregated city. In the least segregated cities, all-white communities were exposed to 38 decibels of nighttime noise on average, compared to 42.5 decibels in the most segregated cities.

The study found that racial and ethnic minorities still bore the burden of noise pollution in segregated cities. Within every level of segregation, [neighborhoods](#) with high proportions of white residents still had the lowest levels of noise.

"In more segregated cities, you see [racial disparities](#) regardless of the segregation level of the city," Morello-Frosch said. "But what you also see is that cities that are more segregated have higher noise levels overall

for everybody."

In more segregated cities, traffic is a large source of noise. Studies of segregation and air pollution have also found that segregated cities have worse air quality overall due to local sources of emissions, such as traffic. The need to drive more in segregated cities could also be contributing to more [noise pollution](#) in these cities.

"This is yet another study that shows that communities of color bear a disproportionate burden of [pollution](#)," Morello-Frosch said. "But I think that the innovative piece about this work is that we also show that social inequality, or segregation, makes things worse for everybody."

More information: *Environmental Health Perspectives*, [DOI: 10.1289/EHP898](#)

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