

Why less noise during the pandemic might help our ears but not our hearts or brains

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Jack hammers. Buzz saws. Screaming toddlers. Barking dogs. Horns

blaring from incessant traffic jams. Any of these can set nerves on edge, especially if you are subjected to the noise for hours, days or weeks on end.

It's more than aggravating. Studies show noise-generated stress is bad for the heart and brain. But pandemic-induced shutdowns and social distancing have led to substantially less noise generated by human activity over the past year, and researchers are looking at whether that could translate into human health benefits.

"We know that stress in a variety of forms is unhealthy. Noise is a type of stress we all encounter in our daily lives," said Dr. Michael Osborne, a cardiologist at Boston's Massachusetts General Hospital who has studied how noise enters the brain and harms the body.

Noise and noise-related stress have been linked to health effects such as hearing loss, sleep disturbance, impaired cognition, [high blood pressure](#), heart disease and metabolic diseases such as diabetes. A 2011 report from the World Health Organization estimated noise pollution in Western Europe annually robs people of more than 1 million healthy life years. A growing body of research continues to shed light on how.

But over the past year, pandemic-related shutdowns, fewer people working outside the home and social distancing have greatly reduced human activity, lowering noise patterns across the globe. One study in the journal *Science* found shutdowns between March and May of 2020 cut the noise generated by [human activity](#) in half, resulting in the "longest and most coherent global seismic noise reduction in recorded history."

An ongoing study in all 50 states uses smartwatch monitors to track noise exposure. Initial data gathered during shutdowns last spring in California, Texas, New York and Florida showed a halving of

environmental noise pollution in these states. Researchers found study participants experienced an average drop of 3 decibel levels.

That's enough to potentially reduce adverse health impacts, such as hearing loss, said the study's lead investigator Richard Neitzel, an associate professor of environmental health sciences at the University of Michigan in Ann Arbor.

For every 3-decibel rise in noise exposure, the risk for hearing loss increases substantially, Neitzel said. "If we can keep noise at a conversation level, below a daily average of 70 decibels, we can completely eliminate noise-induced hearing loss."

To determine how the drop in environmental noise may be affecting people, Neitzel and his team are asking participants to take regular hearing tests on their smartphones for an analysis they expect to do later this year. They're also collecting data on heart rates and self-reported stress levels.

The benefits of better hearing could extend well beyond the ears.

A Lancet Commission report on dementia prevention notes [hearing loss](#) in midlife is one of the largest modifiable risk factors. Last summer, a study published in *Alzheimer's & Dementia* found just 10 decibels of additional neighborhood noise is associated with a 36% higher risk for mild cognitive impairment and a 29% higher risk for Alzheimer's disease.

Osborne's research gives some clues for how environmental [noise](#) may be entering the brain and hurting the body: He found high levels activate the amygdala, a part of the brain involved in processing stress. High levels of activity in the amygdala were associated with an increase in inflammation. "And this associated with downstream cardiovascular

events," he said.

While a quieter environment may result in some benefits, Osborne said other stressors associated with the pandemic could wipe out any health gains.

Anxiety, depression caused by isolation, the loss of family members and other loved ones, fear of contagion, job losses and financial stress all raise concerns of increased health impacts.

"It's the sum of the stress we are facing that impacts us," Osborne said. "I would not be surprised at all to see people with high levels of amygdala activity right now."

That doesn't mean the damage can't be reversed, especially if people find ways to cope with added stresses, said Osborne, who is studying whether mindfulness training might reduce disease in highly stressed people.

"By lessening the constant drive of [stress](#)," he said, "those parts of the brain could become less metabolically active and less hyper-connected, and that could lower inflammation."

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