quiet communities

DATA CENTER NOISE

The public-health evidence about noise

https://datacenternoise.org/the-public-health-evidence-about-noise/

Pathway from problem to solution:

Treating noise as a legitimate government concern isn't new. In 1972, Congress enacted the federal Noise Control Act, requiring EPA to review and publish the scientific evidence on noise's health effects. Its 1978 publication, Noise: A Health Problem, articulates the stress and harmful health effects caused by chronic noise on hearing, heart health, sleep, and mental and social well-being. Furthermore, it emphasizes the special impacts on vulnerable populations, including children and the elderly, and concludes with this statement from the former US Surgeon General, Dr. William Stewart: "Calling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere." The science of noise and health has been reinforced and expanded by nearly 50 years of subsequent research.

Key points

Why continuous noise matters

The evidence most relevant to a permitting or ordinance decision is that chronic environmental noise exposure is associated with measurably elevated risks of physical and mental health disorders, including cardiovascular disease (e.g., ischemic heart disease, heart attack, stroke), metabolic disease (e.g., diabetes, obesity), anxiety, depression, neurodegenerative disease (e.g., dementia), and cognitive and learning impairments.

These impacts operate through a well-characterized stress-hormone pathway. Nighttime noise is especially hazardous, disrupting sleep and causing disproportionate cardiovascular risk, which is particularly relevant for data center noise that runs continually throughout the night. Research shows that incremental increases in noise levels (e.g., 10 decibels) relate to higher risks of these disorders.

The health evidence

This strength of the evidence on noise and health forms the foundation for guidelines and policies published by the World Health Organization, the American Public Health Association, the American Academy of Nursing, and the American Academy of Pediatrics.

Raising awareness of the adverse impacts of noise amongst the public, local officials, and other community leaders can help prevent harmful noise at the source.

+8%

relative risk of ischemic heart disease for each 10 dB above 50 dBA

WHO-commissioned review of road-traffic studies (van Kempen et al., 2018)

145M

Americans estimated to be at risk of noise-related hypertension

APHA, 2021

~90%

of people reporting low-frequency noise problems had sleep difficulties

Dutch survey (Erdélyi et al., 2023)

~2×

the prevalence of anxiety and depression in the most vs. least noise-exposed group

German study, 15,000+ people (Hahad & Prochaska, 2019, via APHA 2021)

+36%

risk of mild cognitive impairment (and +29% Alzheimer's) associated with each 10 dBA increase in neighborhood noise

5,227 older adults, Chicago area (Weuve et al., 2021)

6,000

U.S. schools near major airports: aircraft noise linked to lower test scores; sound insulation reversed it where it was done

National Academies, 2014

Research populations and sources are identified in the graphic. These findings describe the cited studies, not a prediction for a particular facility.

For a fuller discussion of this health effect evidence, with complete citations, see Health Effects of Data Center Noise.

The next page turns to how to measure the sound from data centers.