

Low-Frequency Sound and Health Effects:

Data Center

Concern has been raised about the potential health effects of low-frequency sound (including infrasound) from data centers. This fact sheet summarizes current peer-reviewed scientific consensus and clarifies that data centers have NOT been linked or identified as the source of such health impacts.

What Is Low-Frequency Sound?

- Low-frequency sound = below 200 Hz
- Infrasound = below 20 Hz (typically inaudible)

Key Findings from Peer-Reviewed Research:

1. World Health Organization (WHO)

- WHO Guidelines for Community Noise (1999) and Night Noise Guidelines for Europe (2009) recognize that low-frequency noise can cause annoyance or sleep disturbance at high levels.
- Data centers are NOT named or studied as a specific source.
- WHO acknowledges potential stress-related symptoms from prolonged exposure to high noise levels but has not linked them to data centers.

2. Noise & Health, 2013 (Leventhall et al.)

- Study reviewed annoyance and sleep effects due to low-frequency sound.
- Sources studied: ventilation units, industrial compressors, and wind turbines.
- Concluded: "No consistent evidence from well-controlled studies that low-frequency noise at environmental levels causes health effects beyond annoyance and sleep disturbance."

3. Environmental Health, 2020

- Review focused on infrasound from wind turbines and heavy industrial machinery.
- Found no consistent physiological response or direct health impact at community exposure levels.

4. MDPI Applied Sciences, 2020 Review (39 studies)

- Common symptoms: sleep disturbance, annoyance, headaches.
- Studied sources: industrial plants, railways, HVAC systems in close proximity, not data centers.
- No link to cardiovascular disease was confirmed.

5. BMC Public Health, 2023 Meta-Analysis

- Focused on cognitive effects of low-frequency noise exposure.
- Studied environments: airports, highways, rail, and wind farms.
- No mention of or research on data centers.

6. U.S. EPA / OSHA

- No federal classification of data centers as a health hazard.
- OSHA addresses occupational noise (not residential exposure)
- EPA guidelines focus on ambient community noise, with no data center specific provisions.

Conclusion:

- Scientific consensus does NOT support a direct health risk from data centers via low-frequency noise.
- Data centers were NOT studied or identified as the cause in any of the peer-reviewed research reviewed.

- Documented concerns are tied to other industrial sources like wind turbines, heavy machinery, and transportation corridors.
- Sound mitigation techniques and zoning safeguards (e.g., setbacks, underground equipment, acoustic barriers) can reduce potential nuisance impacts and are standard in modern data center design.

Key Sources:

- WHO. (1999). Guidelines for Community Noise.
- WHO. (2009). Night Noise Guidelines for Europe.
- Leventhall, G. (2004). Low frequency noise and annoyance. *Noise & Health*, 6(23), 5972.
- Salt, A. & Hullar, T. (2010). Responses of the ear to low-frequency sounds, infrasound and wind turbines. *Hearing Research*.
- Knopper, L. & Ollson, C. (2011). Health effects and wind turbines: A review. *Environmental Health*.
- MDPI. (2020). Review on Low-Frequency Noise Effects. *Applied Sciences*.
- BMC Public Health. (2023). Meta-analysis on cognitive function and environmental noise.