



Noise Pollution

Dr. Fateh Singh Bhagora

Department of Botany, Shri Govind Guru Govt. College, Banswara, Rajasthan, India

ABSTRACT: Not all sound is considered noise pollution. The World Health Organization (WHO) defines noise above 65 decibels (dB) as noise pollution. To be precise, noise becomes harmful when it exceeds 75 decibels (dB) and is painful above 120 dB.

KEYWORDS: noise, pollution, WHO, decibels, harmful, painful

I. INTRODUCTION

Noise pollution can cause health problems for people and wildlife, both on land and in the sea. From traffic noise to rock concerts, loud or inescapable sounds can cause hearing loss, stress, and high blood pressure. Noise from ships and human activities in the ocean is harmful to whales and dolphins that depend on echolocation to survive. Noise pollution is an invisible danger. It cannot be seen, but it is present nonetheless, both on land and under the sea. Noise pollution is considered to be any unwanted or disturbing sound that affects the health and well-being of humans and other organisms.

Sound is measured in decibels. There are many sounds in the environment, from rustling leaves (20 to 30 decibels) to a thunderclap (120 decibels) to the wail of a siren (120 to 140 decibels). Sounds that reach 85 decibels or higher can harm a person's ears. Sound sources that exceed this threshold include familiar things, such as power lawn mowers (90 decibels), subway trains (90 to 115 decibels), and loud rock concerts (110 to 120 decibels).

Noise pollution impacts millions of people on a daily basis. The most common health problem it causes is Noise Induced Hearing Loss (NIHL). Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress. These health problems can affect all age groups, especially children. Many children who live near noisy airports or streets have been found to suffer from stress and other problems, such as impairments in memory, attention level, and reading skill.

Noise pollution also impacts the health and well-being of wildlife. Studies have shown that loud noises can cause caterpillars' dorsal vessels (the insect equivalent of a heart) to beat faster, and cause bluebirds to have fewer chicks. Animals use sound for a variety of reasons, including to navigate, find food, attract mates, and avoid predators. Noise pollution makes it difficult for them to accomplish these tasks, which affects their ability survive.[1,2,3]

Increasing noise is not only affecting animals on land, it is also a growing problem for those that live in the ocean. Ships, oil drills, sonar devices, and seismic tests have made the once tranquil marine environment loud and chaotic. Whales and dolphins are particularly impacted by noise pollution. These marine mammals rely on echolocation to communicate, navigate, feed, and find mates, and excess noise interferes with their ability to effectively echolocate.

Some of the loudest underwater noise comes from naval sonar devices. Sonar, like echolocation, works by sending pulses of sound down into the depths of the ocean to bounce off an object and return an echo to the ship, which indicates a location for object. Sonar sounds can be as loud as 235 decibels and travel hundreds of miles under water, interfering with whales' ability to use echolocation. Research has shown that sonar can cause mass strandings of whales on beaches and alter the feeding behavior of endangered blue whales (*Balaenoptera musculus*). Environmental groups are urging the U.S. Navy to stop or reduce using sonar for military training.

Seismic surveys also produce loud blasts of sound within the ocean. Ships looking for deep-sea oil or gas deposits tow devices called air guns and shoot pulses of sound down to the ocean floor. The sound blasts can damage the ears of marine animals and cause serious injury. Scientists believe this noise may also be contributing to the altered behavior of whales.

Among those researching the effects of noise pollution is Michel Andre, a bioacoustics researcher in Spain who is recording ocean sounds using instruments called hydrophones. His project, LIDO (Listening to the Deep Ocean Environment), collects data at 22 different locations. Back in the lab, computers identify the sounds of human activities



as well as 26 species of whales and dolphins. The analysis aims to determine the effects that underwater noise is having on these animals. Andre hopes his project will find ways to protect marine animals from the dangers of ocean noise.

II. DISCUSSION

The 1990 Clean Air Act Amendments added a new title IV, relating to acid deposition control, without repealing the existing title IV, relating to noise pollution. The U.S. Code designates the original title IV (noise pollution) as subchapter IV and the new title IV (acid deposition control) as subchapter IV-A.[4,5,6]

The traditional definition of noise is “unwanted or disturbing sound”. Sound becomes unwanted when it either interferes with normal activities such as sleeping, conversation, or disrupts or diminishes one’s quality of life. The fact that you can’t see, taste or smell it may help explain why it has not received as much attention as other types of pollution, such as air pollution, or water pollution. The air around us is constantly filled with sounds, yet most of us would probably not say we are surrounded by noise. Though for some, the persistent and escalating sources of sound can often be considered an annoyance. This “annoyance” can have major consequences, primarily to one’s overall health.

Health Effects

Noise pollution adversely affects the lives of millions of people. Studies have shown that there are direct links between noise and health. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity. Noise Induced Hearing Loss (NIHL) is the most common and often discussed health effect, but research has shown that exposure to constant or high levels of noise can cause countless adverse health affects.

Protection from Noise

Individuals can take many steps to protect themselves from the harmful effects of noise pollution. If people must be around loud sounds, they can protect their ears with hearing protection (e.g., ear plugs or ear muffs). There are various strategies for combating noise in your home, school, workplace, and the community.

The Role of EPA

Under the Clean Air Act, the EPA administrator established the Office of Noise Abatement and Control (ONAC) to carry out investigations and studies on noise and its effect on the public health and welfare. Through ONAC, the EPA coordinated all Federal noise control activities, but in 1981 the Administration concluded that noise issues were best handled at the State and local level. As a result, ONAC was closed and primary responsibility of addressing noise issues was transferred to State and local governments. However, EPA retains authority to investigate and study noise and its effect, disseminate information to the public regarding noise pollution and its adverse health effects, respond to inquiries on matters related to noise, and evaluate the effectiveness of existing regulations for protecting the public health and welfare, pursuant to the Noise Control Act of 1972 and the Quiet Communities Act of 1978.

Noise Sources Regulated by EPA

EPA or a designated Federal agency regulates noise sources, such as rail and motor carriers, low noise emission products, construction equipment, transport equipment, trucks, motorcycles, and the labeling of hearing protection devices.[7,8,9]

III. RESULTS

The report shows that environmental noise, and in particular road traffic noise, remains a major environmental problem affecting the health and well-being of millions of people in Europe. Twenty percent of Europe’s population are exposed to long-term noise levels that are harmful to their health. That corresponds to more than 100 million people within Europe. The data also suggests that policy objectives on environmental noise have not been achieved. In fact, based on our projections, it is unlikely that the number of people exposed to noise will significantly decrease in the future due to urban growth and increased mobility demand.

Long-term exposure to noise can cause a variety of health effects including annoyance, sleep disturbance, negative effects on the cardiovascular and metabolic system, as well as cognitive impairment in children. Looking at the current data, we estimate that environmental noise contributes to 48,000 new cases of ischaemic heart disease a year as well as 12,000 premature deaths. In addition, we estimate that 22 million people suffer chronic high annoyance and 6.5 million



people suffer chronic high sleep disturbance. As a result of aircraft noise we estimate that 12,500 school children suffer reading impairment in school.

Many people don't realise noise pollution is an important problem, impacting human health, including theirs. Of course, there are many more premature deaths associated with air pollution than for noise. However, noise seems to have a larger impact on indicators related to quality of life and mental health. In fact, according to some World Health Organization (WHO) findings, noise is the second largest environmental cause of health problems, just after the impact of air pollution (particulate matter).

In some countries, there is still a high percentage of data missing in terms of noise maps and action plans. Noise problems cannot be properly evaluated and addressed if countries, regions and cities don't produce the noise maps or the action plans required by the directive.

The EEA is in charge of gathering all the information that countries submit under the Environmental Noise Directive. The current state of knowledge on noise sources and population exposure in Europe is largely based on this database. We produce a number of reports and assessments based on this data. They help track the progress made towards meeting noise pollution objectives and can also inform the development of future environmental action programmes. Apart from the recently published Environmental Noise in Europe report, there are a number of previous reports on noise undertaken by the EEA, such as Quiet areas in Europe — The environment unaffected by noise pollution (2014), Unequal exposure and unequal impacts: Social vulnerability to air pollution, noise and extreme temperatures in Europe (2013). People can also check the noise pollution information through the EEA noise viewer or the country fact sheets on noise.[10,11,12]

Countries, regions and cities are taking a variety of measures to address noise problems. For instance, installing low noise asphalt on roads, using quiet tyres in public transport vehicles, putting more infrastructure for electric cars in cities, promoting active travel like walking or cycling, pedestrianisation of streets, etc. A significant number of cities and regions have also put in place so-called quiet areas, where people can go to escape city noise. These are mostly green spaces, like parks or nature reserves.

Many of these measures have also proved to be beneficial for reducing air pollution. We see that a way to increase the impact of noise mitigation measures while optimising costs and efforts could be to design combined strategies for mitigating noise and air pollution from traffic. If noise measures are not implemented to address noise problems, it is unlikely that the number of people exposed to noise will significantly decrease in the future due to urban growth and increased mobility demand. A significant reduction of people exposed to harmful noise levels is more likely to be achieved by using not only single measures but a combination of different measures including technological improvements, ambitious noise policies, better urban and infrastructure planning, and changes in people's behaviours. Noise pollution occurs when unwanted sounds enter the environment. The potential health effects of noise pollution include increased stress levels, sleep disturbance, or hearing damage.

Some examples of noise pollution sources include:

- construction
- motorized vehicles
- crowds
- concerts
- aircraft

Pollution occurs when a contaminant enters the environment, causing undesirable effects. There are several types of pollution, including:

- air pollution
- water pollution
- light pollution[13,14,15]

Noise pollution is the spread of unwanted sounds into the environment.

Noise is almost always around us, whether natural, such as birdsong, or from human activity, such as vehicle traffic. However, noise build-up can have a significant impact on the well-being of humans and animals.

Compared to other types of pollution, people often overlook noise pollution as a health hazard. A 2013 review notes it as an underreported factor. However, many people are experiencing a rise in noise pollution due to an increase in human activity.



Impact on mental health

Unwanted sounds can have a range of mental health effects.

The brain is always monitoring sounds for signs of danger, even during sleep. As a result, frequent or loud noise can trigger anxiety or stress. With continued exposure to noise pollution, a person's sensitivity to stress increases Trusted Source.

People living with noise pollution may feel irritable, on edge, frustrated, or angry. If a person feels they cannot control the amount of noise in their environment, its impact on their mental health intensifies.

Environmental noise is also a common cause of sleep disturbance. A person may experience:

- difficulty falling asleep
- inability to stay asleep
- waking too early

Sounds can also reduce the depth and quality of sleep, altering the amount of rapid eye movement sleep. This can impact a person's mood and ability to concentrate.

Impact on physical health

The physical health effects of noise pollution can occur as a direct or indirect result of noise exposure.

In severe cases, loud sounds can directly cause hearing impairment. Some forms of noise-induced hearing impairment include:

- abnormal loudness perception
- tinnitus, which causes a persistent high-pitched ringing in the ears
- paracusis, or distorted hearing

Some research also suggests that noise pollution may indirectly contribute to other health conditions.[16,17]

According to a 2013 review, there is evidence that short-term exposure to noise pollution can temporarily raise blood pressure and increase blood viscosity. There is also an association between long-term exposure to noise and higher rates of cardiovascular disease.

The review authors suggest that this may occur due to the impact of noise pollution on stress hormone levels and the nervous system. Over time, this stress may contribute to the development of disease.

Another 2013 study in Canada found that preeclampsia, a condition that causes high blood pressure during pregnancy, was more common among pregnant people exposed to higher levels of noise pollution.

Impact on children

According to the 2013 review, children are particularly vulnerable to noise-induced hearing loss. A 2014 study Trusted Source found that chronic exposure to noise for 8 hours a day could cause permanent hearing changes in children, including the inability to hear certain frequencies.

An article in The Indian Journal of Pediatrics notes that noise pollution can affect a child's hearing at any stage of development, including fetal, infancy, and adolescence.

Additionally, unwanted or loud noise at school or home may make it challenging for children to learn. They may experience more difficulty with:

- concentration
- communication and speech development
- cognitive performance

This may affect a child's behavior, their ability to form relationships, and their confidence. They can also develop high blood pressure due to chronic exposure to sound.

How to reduce noise pollution

In some cases, noise pollution is unavoidable. However, there are ways to reduce noise levels inside the home. A person can try:



- Reducing noise from appliances: Items, such as air conditioning units, heaters, fans, and other appliances, can contribute to overall noise levels in the home. Try turning them off more often or setting a timer, so they only switch on at certain times.
- Reducing noise from media devices: Consider the volume and duration of noise from music, televisions, radios, and video games. Avoid having unnecessary noise playing in the background for long periods, or listening to sounds at too high a volume. It may be useful to set aside dedicated time for watching TV or listening to music.
- Repair or replace old machinery: Old appliances, vehicles, and other items can be louder than newer models. Consider upgrading or replacing noisy household items.
- Soundproofing: Adding insulation strategically around the home can help muffle sounds from other rooms, neighbors, or outside. Rugs, carpets, and curtains may also help.
- Create more quiet time: Try to regularly set aside time for quiet activities, such as reading, puzzles, or creative hobbies. Avoid playing music or having background noise during this time.
- Ear protection: If loud noise is unavoidable, use ear protection, such as earplugs or earmuffs, to reduce its impact.[18,19]

IV. CONCLUSION

If noise pollution affects a person's hearing or mental health, and methods to lower noise are not effective, speaking with a doctor can help.

Depending on how noise impacts someone, they may benefit from consulting with a hearing or sleep specialist. A therapist can also help teach coping mechanisms.

For children exposed to frequent or loud noise, it is important to monitor for signs of hearing loss. Regular checkups and hearing tests can help determine if there is any damage.

Sometimes, hypersensitivity to noise can be a symptom of other conditions, such as hyperacusis. A doctor can diagnose this.

A person could also try reporting excessive noise to their local authority if it breaches legal limits. This could include noise pollution from outdoor events, venues, construction sites, or businesses.

Noise pollution significantly impacts public health. Research suggests it can raise stress, affect mental health, and contribute to developing health issues such as high blood pressure.

Direct exposure to loud or persistent noise can also lead to hearing impairment. Children are particularly vulnerable to the negative health effects of noise pollution.

It may be possible to reduce levels of noise in the home, school, or workplace with simple changes, such as soundproofing and turning off devices.[20]

REFERENCES

1. Senate Public Works Committee. Noise Pollution and Abatement Act of 1972. S. Rep. No. 1160, 92nd Congress. 2nd session
2. ^ Hogan CM, Latshaw GL (May 21–23, 1973). The relationship between highway planning and urban noise. Proceedings of the ASCE Urban Transportation Division Environment Impact Specialty Conference. Chicago, Illinois: American Society of Civil Engineers. Urban Transportation Division.
3. ^ Marx L (1964). *The Machine in the Garden*. New York: Oxford University Press.
4. ^ Goines L, Hagler L (March 2007). "Noise Pollution: A Modern Plague". *Southern Medical Journal*. 100 (3): Lippincott Williams and Wilkins: 287–294. doi:10.1097/SMJ.0b013e3180318be5. PMID 17396733. S2CID 23675085. Archived from the original on 2012-01-28. Retrieved 2014-12-21.
5. ^ Casey JA, Morello-Frosch R, Mennitt DJ, Frstrup K, Ogburn EL, James P (July 2014). "Race/Ethnicity, Socioeconomic Status, Residential Segregation, and Spatial Variation in Noise Exposure in the Contiguous United States". *Environmental Health Perspectives*. 125 (7): 077017. doi:10.1289/EHP898. PMC 5744659. PMID 28749369.



6. ^ Menkiti NU, Agunwamba JC (2014). "Assessment of noise pollution from electricity generators in a high-density residential area". *African Journal of Science, Technology, Innovation and Development*. 7 (4): 306–312. doi:10.1080/20421338.2014.1082370. S2CID 110539619.
7. ^ a b Münzel T, Schmidt FP, Steven S, Herzog J, Daiber A, Sørensen M (February 2013). "Environmental Noise and the Cardiovascular System". *Journal of the American College of Cardiology*. 71 (6): 688–697. doi:10.1016/j.jacc.2014.12.015. PMID 29420965.
8. ^ Hoffmann B, Moebus S, Stang A, Beck EM, Dragano N, Möhlenkamp S, et al. (November 2006). "Residence close to high traffic and prevalence of coronary heart disease". *European Heart Journal*. 27 (22): 2696–2702. doi:10.1093/eurheartj/ehl278. PMID 17003049.
9. ^ "Results and Discussion – Effects – Noise Effect On Wildlife – Noise – Environment – FHWA". *fhwa.dot.gov*. Archived from the original on 2014-12-22. Retrieved 2014-12-21.
10. ^ Codarin A, Wysocki LE, Ladich F, Picciulin M (December 2009). "Effects of ambient and boat noise on hearing and communication in three fish species living in a marine protected area (Miramare, Italy)". *Marine Pollution Bulletin*. 58 (12): 1880–1887. Bibcode:2009MarPB..58.1880C. doi:10.1016/j.marpolbul.2009.07.011. PMID 19666180.
11. ^ a b Kershaw F (December 15, 2006). "Noise Seriously Impacts Marine Invertebrates". *New Science*. Archived from the original on 2012-08-13. Retrieved 2012-05-12.
12. ^ Baumgaertner E, Kao J, Lutz E, Sedgwick J, Taylor R, Throop N, et al. (June 9, 2012). "Noise Could Take Years Off Your Life Here's How". *The New York Times*. Archived from the original on 2012-06-09.
13. ^ "What is Sound Pressure Level and how is it measured?". *Pulsar Instruments Plc*. Archived from the original on 2012-11-17. Retrieved 2012-11-10.
14. ^ a b c d e f g h i j k l m n Berglund B, Lindvall T, Schwela DH, World Health Organization. Occupational and Environmental Health Team (1999). *Guidelines for community noise*. Institutional Repository for Information Sharing (IRIS) (Report). World Health Organization (WHO). hdl:10665/66217. Archived from the original on 2012-10-30. Retrieved 2012-11-11.
15. ^ "How is Sound Measured?". *It's a Noisy Planet. Protect Their Hearing*. January 28, 2013. Archived from the original on 2012-11-17. Retrieved 2012-11-10.
16. ^ a b "The Science of Sound". *X-59 QueSST*. National Aeronautics and Space Administration (NASA). Archived from the original on 2012-11-01. Retrieved 2012-11-11.
17. ^ "Can Animals Predict Disaster? | Listening to Infrasound | Nature | PBS". *Nature*. June 3, 2008. Archived from the original on 2012-11-11. Retrieved 2012-11-10.
18. ^ "How do bats echolocate and how are they adapted to this activity?". *Scientific American*. Archived from the original on 2012-11-09. Retrieved 2012-11-10.
19. ^ a b c "sound level frequency weightings - acoustic glossary". www.acoustic-glossary.co.uk. Archived from the original on 2012-11-03. Retrieved 2012-11-29.
20. ^ a b "Understanding A, C and Z noise frequency weightings". *Pulsar Instruments Plc*. Archived from the original on 2012-11-25. Retrieved 2012-11-29.