

Highlights on Effects of Noise Pollution

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BACKGROUND

Noise pollution is considered as more important environmental problem, especially in the industrialized and developed countries. Industrial noise is an important source of noise pollution, which annoys and disrupts the daily activities of workers. A growing body of research reveals, transport noise can cause sleep disturbance, cardiovascular disease, elevated hormone levels, psychological problems and even premature death; studies on children have identified cognitive impairment, worsened behavior and diminished quality of life.

More widely, the negative effects of transport noise have been known for years, but in light of pressing air pollution problems, noise has often taken a back seat. The situation now appears to be changing.

Environmental noise consists of all the unwanted sounds in our communities except that which originates in the workplace. Environmental noise pollution, a form of air pollution, is a threat to health and well-being. It is more severe and widespread than ever before, and it will continue to increase in magnitude and severity because of population growth, urbanization, and the associated growth in the use of increasingly powerful, varied, and highly mobile sources of noise. It will also continue to grow because of sustained growth in highway, rail, and air traffic, which remain major sources of environmental noise. A lack of sleep,

caused by the traffic noise, can also affect the immune system and metabolism. In many cases, people in the city may not realize their sleep patterns are being thrown off by noise pollution.

The sound is a mechanical wave that results from variations, or oscillations, in elastic medium like water, air and solids and "Noise" generally can be defined as unpleasant and disturbing sounds which disturb the human being physically and physiologically and cause environmental pollution by destroying environmental properties and it is one of the physical environmental factors affecting our health in today's world and harmful to people. Noise can be measured by determining the pressure created by the sound waves in the human ear and is measured in (dB), which is used as an international measure of the intensity of sound.

Due to the rapid growth and development in technology which is occurred in the developing countries, noise pollution has become one of the major threats that face the environment and the cost of reducing it in future years is expected to be insurmountable and it is considered to be the commonest reason of annoyance and permanent hearing loss.

Acoustic quieting is the process of making machinery quieter by damping vibrations to prevent them from reaching the observer.

Noise decreases as distance from its source increases. When two identical

noise sources are side by side producing a recorded noise of, say, 100 dB(A) the reduction in noise from removing one of the noise sources is about 3 dB, resulting in 97 dB(A). When the distance to a noise source is doubled the recorded noise level is reduced by 6 dB, sometimes called the Rule of 6.

SURVEY ON NOISE POLLUTION

A new study from Denmark found that noise pollution increased the risk of heart attack for people living nearby. Researchers followed over 50,000 people for an average of 10 years in two major cities. Between 40 and 80 decibels, every 10 decibel increase in traffic noise was linked to a 12 percent higher risk of heart attack. The noise of a refrigerator humming is around 40 decibels, while a garbage disposal is 80 decibels.

The increased risk of heart attack remained even after the researchers took into account other factors like air pollution, diet, gender, and weight. In addition, adjusting the results for blood pressure, cholesterol, and diabetes reduced the risk only slightly.

At the close of year 2008, the European Environment Agency (EEA) released its TERM report *Transports at a crossroads*, the first to contain an assessment of EU-wide noise data. The findings paint a bleak picture – 55% of those living in urban areas with more than 250 000 inhabitants in the European Union 27 member states (67 million people) endure daily road noise levels above the lower EU benchmark for excess exposure. The noise of traffic may affect the heart by creating more stress. This causes the heart rate and blood pressure to increase, along with a spike in the stress hormone cortisol, all of which are bad for heart health over the long run.

A new analysis conducted an environmental assessment of US noise

pollution as a cardiovascular health hazard, and revealed small decreases in noise could add up to major economic savings. The analysis suggested that a 5-decibel noise reduction would reduce the prevalence of high blood pressure by 1.4 percent and coronary heart disease by 1.8 percent. The annual economic benefit was estimated at \$3.9 billion.

The researchers assumed that noise exposure levels in 2013 were the same as those assessed in 1981. However, as urbanization has increased it's likely these are underestimates and reductions in noise may impact even more people than the study suggested.

EFFECTS OF NOISE POLLUTION

Noise pollution affects both human and animal health. It leads to:

- contraction of blood vessels
- making skin pale
- Excessive adrenalin in the blood stream which is responsible for high blood pressure.
- Blaring sounds are known to cause mental distress
- Heart attacks, neurological problems, birth defects and abortion
- Muscle contraction leading to nervous breakdown, tension, etc

Hearing Loss- Noise-induced hearing loss (NIHL), which can occur from one very loud noise exposure (such as an explosion) or continuous exposure to loud noise over time (such as working in a factory), and it can affect about 15 percent of people.

Ultrasonic sound can affect the digestive, respiratory, cardiovascular system and semicircular canals of the internal ear. The brain is adversely affected by loud and sudden noise by jets and airplanes. People are subjected to psychiatric illness. The adverse reactions are coupled with a change in hormone content of

blood, which in-turn increases heartbeat, constriction of blood vessels, digestive spasms and dilation of the pupil of the eye. Adverse effects health, work efficiency and behavior. Noise pollution may cause damage to the heart, brain, kidneys, liver and may produce emotional disturbance.

The most immediate and acute effect of noise is impairment of hearing that diminishes some part of the auditory system. Prolonged exposure to noise of certain frequency pattern leads to chronic damage to the inner ear. Impulsive noise may cause psychological and pathological disorders.

Recent reports suggest that blood is thickened by excessive noise. The optical system of human beings is also affected by noise pollution. Severe noise pollution causes:

- Pupillary dilation
- Impairment of night vision and
- Decrease in rate of colour perception

CONTROL MEASURES

Source Control: This includes source modification such as acoustic treatment to machine surface, design changes, limiting operational timings, etc.

Transmission Path Intervention: This includes containing the source inside a sound insulating enclosure, constructing a noise barrier or provision of sound absorbing materials along the path.

Receptor Control: This includes protection of the receiver by altering the work schedule or provision of personal protection devices such as ear plugs for operating noisy machinery. The measure may include dissipation and deflection methods.

Oiling: Proper oiling will reduce noise from the machine.

Preventive Measures

1. Prescribing noise limits for vehicular traffic
2. Ban on honking (usage of horns) in certain areas
3. Creation of silence zones near schools and hospitals
4. Redesigning buildings to make them noise proof
5. Reduction of traffic density in residential areas
6. Giving preference to mass public transport system.
7. Improvements to vehicles and aircraft aerodynamics and components, including low noise tyres, train wheels, brake-blocks, and landing gears.
8. Improvements to infrastructure, such as low noise road surfaces and rail tracks.
9. Urban planning that limits encroachment close to busy roads, railways or airports, and rules on the location, layout and acoustic quality of buildings.
10. Traffic management techniques, such as traffic calming, controlling the speed of road vehicles, and low noise operational procedures for aircraft.
11. Restricting access for the noisiest vehicles and aircraft.
12. Noise barriers and improved soundproofing of dwellings.

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