

NOISE AND SOUND AND ITS EFFECT ON HUMAN HEALTH IN BUILDINGS

INTRODUCTION

The noise pollution is defined as the unwanted sound which is released into the environment. It disturbs the human being and cause an adverse effect on the mental and psychological wellbeing. It is measured in the units of decibels and is denoted by the dB. The noise which is more than 115 dB is tolerant. The industrial limit of sound in the industries must be 75 dB according to the produce a sound at 60 dB.

WHAT IS NOISE?

Sound becomes undesirable when it disturbs the normal activities such as working; sleeping; and during conversations.

It is an underrated environmental problem because of the fact that we can't see; smell; or taste it.

DAY AND NIGHT NOISE LEVELS

Typical Noise Level per dB

Day	Night	Acoustical Quality
35	35	natural sounds only
50	40	quiet rural environment
55	45	suburban neighbourhood
65	50	urban noise situation
75	75	very noisy, unfit for permanent habitation

NOISE LEVEL AND EFFECT

- | | |
|------------|--|
| ⊙ <55dBA | Desirable level outdoor Suburban neighbourhood |
| ⊙ 55-65dBA | Urban “Grey Areas”: Annoyance |
| ⊙ >65dBA | Black spots: Stress effects, sleep disturbance, communication performance deficits |
| ⊙ >75dBA | Unfit for Human habitation, hearing loss, cardiovascular effects |

NOISE SOURCES

- ⊙ Road Traffic
- ⊙ Air Traffic
- ⊙ Rail Traffic
- ⊙ Industry
- ⊙ Recreational Activities
- ⊙ Construction Sites
- ⊙ Traffic on Waterways

SOURCE OF NOISE POLLUTION

- ⊙ Industrial noise also adds to the already unfavorable state of noise pollution.
- ⊙ Loud speakers, plumbing, boilers, generators, air conditioners, fans, and vacuum cleaners add to the existing noise pollution.

CLASSIFICATION OF NOISE POLLUTION

There are 2 kinds of noise pollution.

A. community noise / environmental

Noise (non industrial noise pollution)

>Air craft noise

>Roadway noise pollution

>Under water noise pollution

B. Occupational Noise (industrial noise pollution)

COMMUNITY NOISE

Community noise (also called environmental noise, residential noise or domestic noise)

Is defined as noise emitted from all sources, except at the industrial workplace.

Main sources of community noise include road, rail and air traffic, construction and public work, and the neighborhood.

Typical neighborhood noise comes from live or recorded music; from sporting events including motor sports; from playgrounds and car parks; and from domestic animals such as barking dogs.

AIR CRAFT NOISE POLLUTION

Noise from planes flying over residential areas impairs people's ability to work, learn in school and sleep, and consequently also results in lowered property values in affected areas.

As passenger volume increases and new and larger airports are built, noise is becoming even more of a concern.

ROADWAY NOISE POLLUTION

Roadway noise is the collective sound energy emanating from motor vehicles.

In the USA it contributes more to environmental noise exposure than any other noise source, and is constituted chiefly of engine, tire, aerodynamic and braking elements.

In other western countries as well as lesser developed countries, roadway noise is expected to contribute a proportionately large share of the total societal noise pollution.

NOISE POLLUTION AND ITS EFFECTS ON HUMANS

1. Chronic exposure to noise may cause noise-induced hearing loss. Older males exposed to significant occupational noise demonstrate significantly reduced hearing sensitivity than their non-exposed peers.

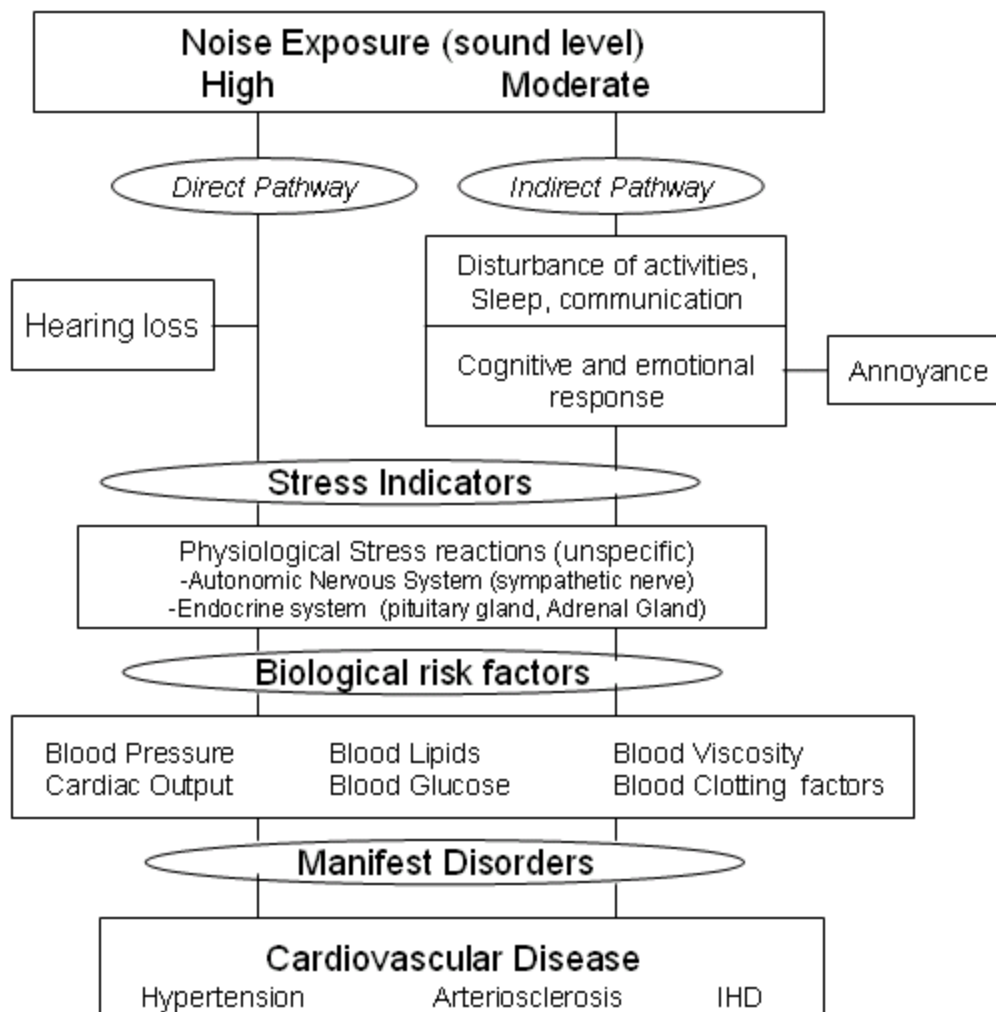
2. Unwanted noise can damage physiological and psychological health. Noise pollution can cause annoyance and aggression, hypertension, high stress levels, tinnitus, hearing loss, sleep disturbances, and other harmful effects.

3. High noise levels can contribute to cardiovascular effects and exposure to moderately high levels during a single eight hour period causes a statistical rise in blood pressure and an increase in stress and vasoconstriction leading to the increased blood pressure noted above as well as to increased incidence of coronary artery disease.

Long term noise exposure is associated with a number of effects on health and well-being. These include community responses such as annoyance, sleep disturbance, disturbance of daily activities and performance, and physiological effects such as hearing loss, hypertension and ischemic heart disease (Berglund et al., 1999). Although there is much discussion about how noise can affect human health, it is hypothesised that stress plays an important role.

The model assumes that health status is determined by a combination of endogenous and exogenous factors such as the physical and social environment and life style. Noise exposure is only one of these exogenous factors. This process may be modified by personal characteristics such as attitude and coping style. Noise exposure induces disturbance of sleep and daily activities, annoyance and stress, which may lead to all sorts of intermediate responses, such as hypertension. In turn, these may affect the risk of cardiovascular disease or psychiatric disorders.”

Figure 1- explain the complex links/associations between the external noise exposure and the effects on human health



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