

The Case for Establishing Environmental Noise Standards OR

*Are Environmental Exposures Impacting
Occupational Safety Levels?*

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29 CFR 1910.95 OSHA Occupational Noise Standard 8 hours per day, 40 hours per week





The Goal is to prevent noise induced hearing loss throughout the lifetime.

Photo CDC.org

Environmental Noise Exposure

- ▶ **WORKING ADULTS:** Remaining (non-working) 16 hours per day, 128 hours per week
- ▶ **ALL OTHERS:** 24 hours per day, 7 days per week (children, elderly, and non-working adults)

CDC REPORTS HEARING LOSS AS 3rd MOST COMMON CHRONIC CONDITION IN US

- ▶ 1 OF 4 adults who report “excellent to good” hearing already have *irreversible hearing loss*.
- ▶ 70 % of persons exposed to *hazardous environmental noise* seldom or never wear hearing protection.

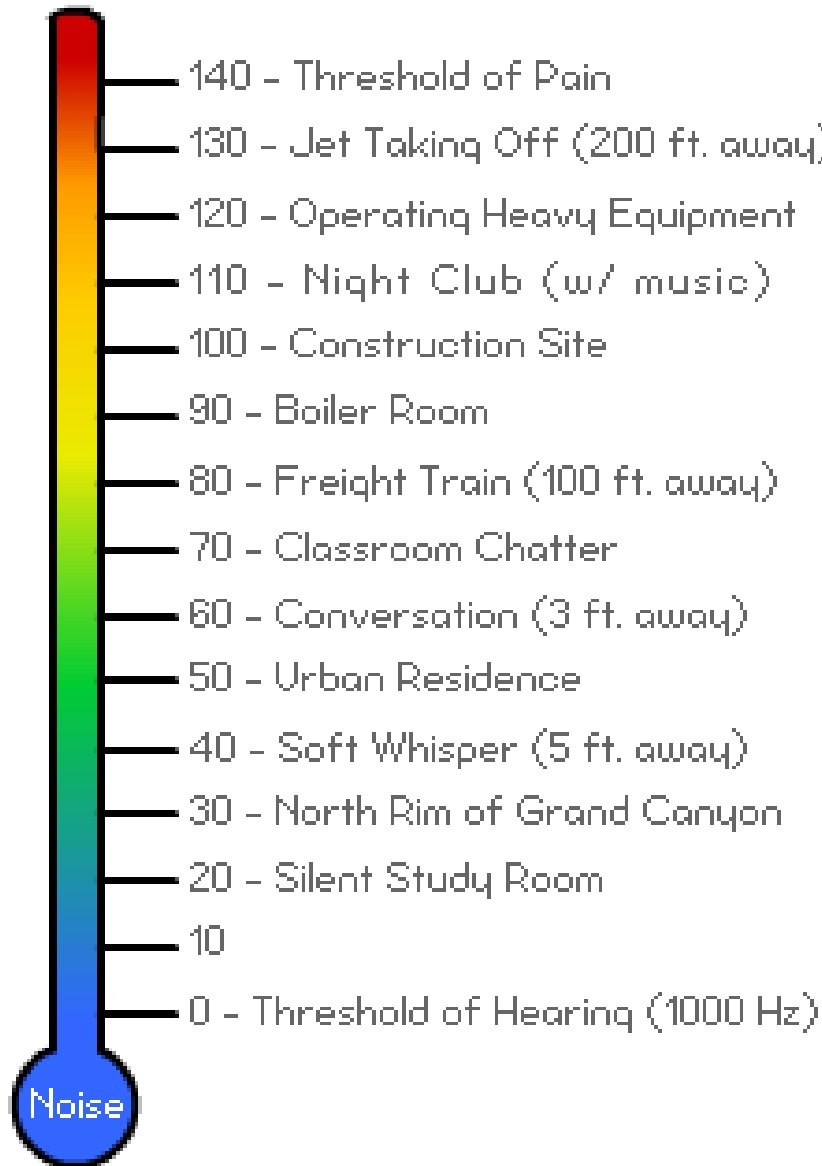
PROBLEM with CURRENT APPROACH TO ENVIRONMENTAL NOISE EXPOSURES

- ▶ There is confusion over what is annoyance level noise and hazardous noise in environmental setting.
- ▶ Often persons complaining of annoyance level noise get the attention while those exposed to hazardous noise are being ignored.
- ▶ Employers with Occupational Noise Programs pay the price in Significant Threshold Shifts, added controls and increased workers' compensation costs.

How hearing loss occurs.



Typical Sound Levels (dBA)



Hearing loss is costly.

The cost for the first year of hearing loss treatment in older adults is projected to increase more than 500% from \$8 billion in 2002 to an **estimated \$51 billion in 2030.**

SOURCE: Journal of the American Geriatrics Society, 2010

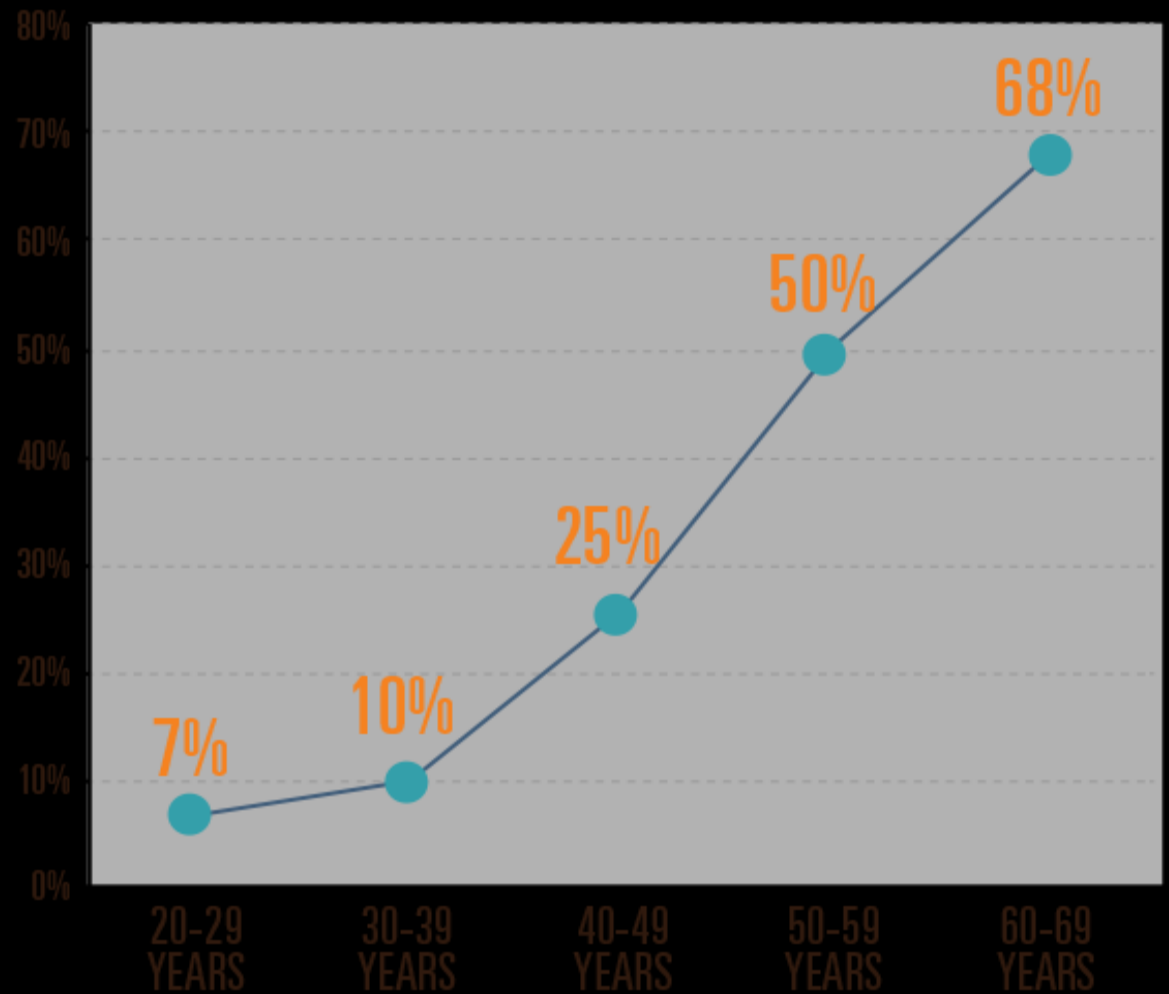
Hearing loss from loud noise can be prevented.

About 70% of people exposed to loud noise never or seldom wear hearing protection.

SOURCE: National Health and Nutrition Examination Survey, 2011-2012

People with hearing loss.

(Not able to hear high-pitched sounds)



SOURCE: National Health and Nutrition Examination Survey, 2011-2012

Age: 20-29 30-39 40-49 50-59 60-69

OSHA NOISE STANDARD 29CFR 1910.95

- ▶ OSHA's PERMISSIBLE EXPOSURE LIMIT (PEL) is 90 dBA for 8 hour time weighted average (TWA):
 - ▶ Hearing Conservation Program required
 - ▶ Annual Audiogram required
 - ▶ Training required
 - ▶ Hearing Protection required

- ▶ OSHA's ACTION LEVEL LIMIT is 85 dBA for an 8 hour TWA:
 - ▶ Hearing Conservation Program required
 - ▶ Annual Audiogram required
 - ▶ Training required
 - ▶ Hearing Protection made available

NIOSH'S Recommended Exposure Level (REL) is 85 dBA for an 8 hour TWA.

If Annual “Work” Audiogram reveals “Significant Threshold Shift” in hearing loss

*Hearing loss assumed to be caused by
occupational noise exposure.*

- ▶ Employer must take additional measures to protect worker.

Employer Actions To Reduce Employee Noise Exposures

1. **Eliminate** the noise
2. **Substitute** a less noisy condition or process
3. **Engineering** measures to reduce noise levels or isolate worker from noise
4. **Administrative Controls** - rotate workforce
5. **Personal Protective Equipment**

PROBLEMS:

- ▶ **Costly to employer** financially, administratively and productivity.
- ▶ **Ineffective** in controlling worker's continued hearing loss if environmental noise is cause of STS.

BOTH OSHA & NIOSH Standards Based on “ASSUMPTION” of QUIET Time for Employee’s Remaining 16 Hours of Personal Time



NOISE LEVELS ARE LOGRITHMIC

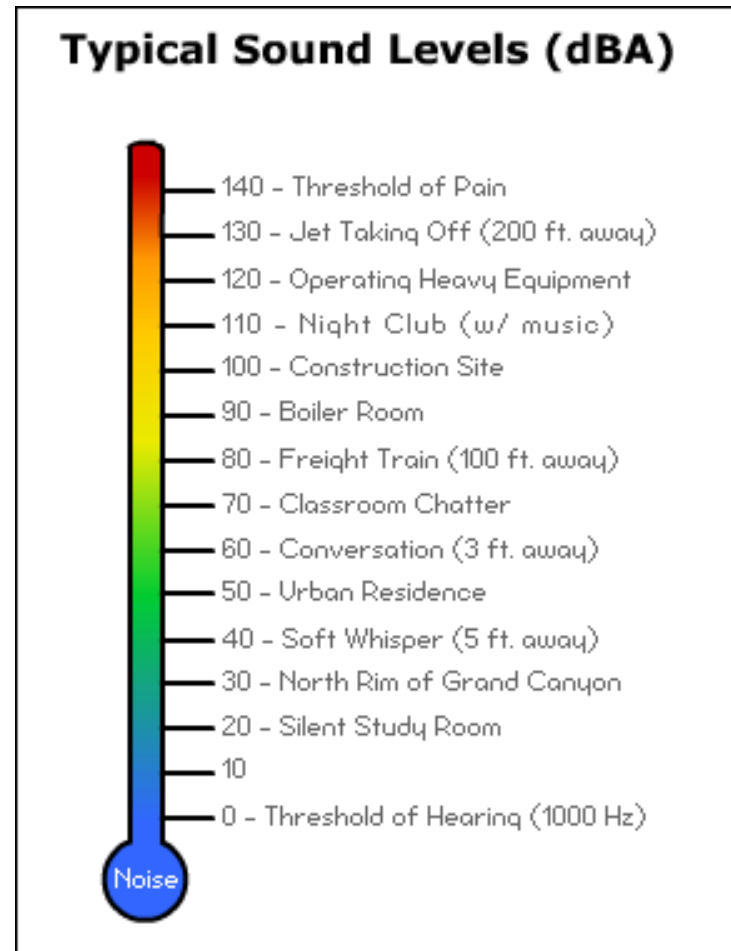
So there is significant difference in increase or decrease of 5 decibels

OSHA 1910.95 NOISE STANDARD TABLE G-16 - PERMISSIBLE NOISE EXPOSURES

Duration per day, hours	Allowable Sound level dBA
8.....	90
6.....	92
4.....	95
3.....	97
2.....	100
1 1/2	102
1.....	105
1/2	110
1/4 or less.....	115

Night Club with Music is 110 dBA

OSHA's PEL for 110 dBA is 30 minutes!





A program of the National Institutes of Health



Too Loud! For Too Long!

#VitalSigns

40 Million

About 40 million US adults aged 20-69 years have noise-induced hearing loss.

#VitalSigns

National Institute of Health: Review of environmental factors affecting hearing.

[J H Mills](#) and [J A Going](#) [Environ Health Perspect.](#) 1982 Apr; 44: 119-127.

- ▶ Major nongenetic causes of sensorineural hearing loss are exposure to noise, aging, ototoxic drugs, viral and bacterial infections, and interactions between these factors.
- ▶ Regarding exposure to continuous noise, the data base from laboratory and field studies indicates that a risk of **hearing loss is present when noise levels exceed 75-80 dBA.**
- ▶ As noise level, duration and number of exposures increase so does risk.

EPA's Noise Control Act of 1972 established national policy “to promote an environment for all Americans free from noise that jeopardizes their health and welfare.”

- ▶ “Allowable” noise levels established in 1974 EPA document, [“Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety \(PDF\).”](#)
- ▶ **PURPOSE:** *“To provide basis for state and local governments' judgments in setting ENVIRONMENTAL NOISE standards.”*
- ▶ **70 decibels per 24-hours** to prevent any measurable hearing loss over a lifetime.
- ▶ **55 decibels outdoors and 45 decibels indoors** to prevent activity interference and annoyance.
- ▶ **These levels considered safe** to permit spoken conversation and other activities such as sleeping, working and recreation, which are part of the daily human condition.

How do we control individual choices / tolerances to high noise levels on their free time, in their home or neighborhood?

Photos NIH.org and WLRN.org



Many Municipalities institute a “if someone complains then it’s too noisy” policy

▶ Courts are now saying provide a level that has been exceeded.

“Establish an Environmental Standard”

- ▶ Who samples?
- ▶ Training?
- ▶ For how long?
- ▶ What equipment?
- ▶ Where? What distance?
- ▶ Report findings to whom?
- ▶ What if don't /can't correct?
- ▶ Then what?



OUR CHALLENGE?

- ▶ *How to effectively promote joint efforts to prevent occupational and environmental HEARING LOSS to ensure lifelong healthy hearing!*



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Final Thought:

We are not the only species harmed by excessive ENVIRONMENTAL NOISE . . .

Excessive Environmental Noise can impact the survival of animal species by interfering with their ability to communicate.

