Environmental Noise: Public Health Effects and Legal Remedies
Thursday June 20, 2013

American Society of Law, Medicine & Ethics
Network for Public Health Law
Public Health Law Research Program

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2. Discussions in Public Health Law Theory and Governance
3. Myths in Public Health Law
4. Advancing Public Health through Law: The George Project
5. Preparation for Practice: Incorporating Knowledge, Skills, and Values in Public Health Law Education
8. Regulating for the Public's Health: Food and Beverages, Drugs, and Emerging Technologies
11. Public Health Law and Medical Care Facilities: Community Benefits, ACOs, and Medical-Legal Partnerships

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  - American Society of Law, Medicine & Ethics
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- Next webinar is Thursday, July 18 – Sodium Reduction: The efforts, challenges, and successes of reducing sodium intake in the U.S
Presented by

- Sid Shapiro, J.D., University Distinguished Chair in Law, Wake Forest University School of Law
- Alice S. Suter, M.S. Ed, Ph.D., Consultant, formerly of United States Environmental Protection Agency and National Institute for Occupational Safety and Health
- June Weintraub, Sc.D., M.S., B.S.C.E., Senior Epidemiologist, San Francisco Department of Health
- Monica S. Hammer, J.D., Robert Wood Johnson Foundation Visiting Attorney, Network for Public Health Law Mid-States Region
Noise Effects and Regulation
Alice H. Suter, Ph.D.
Suter & Associates, Portland, Oregon

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Road Traffic Noise
Railroad Noise
Construction Noise
Recreational Noise
Not the Best Solution

Mayors back Logan foes
The Noise Control Act of 1972

- Sponsored by Senator John Tunney
- Muskie wanted aircraft noise in EPA
- Cannon insisted ac stay in FAA
- Bill stuck in committee
- Citizen lobbyists: AFL-CIO, APHA, Sierra Club, ASHA, Council of Mayors
- Weakened by reconciliation process
- Passed in last hours of 92nd Congress
Rationale for NCA

- Cities and states not financially or technologically able to deal with noise problems
- 1971 - EPA received requests from 28 states and 111 cities for noise assistance
- LAX lawsuits
- EPA had no power to make changes
Noise Control Act

- National policy to promote environment free from noise that jeopardizes public health and welfare.
- Created ONAC within EPA
- Coordinate all Fed. agency noise programs
- Develop criteria for noise effects
- Identify safe levels
- Identify products - major sources of noise
- Regulate noisy products
- Study adequacy of FAA’s efforts to reduce noise
- Make Rx to FAA for their action
Noise Control Act cont.

- Label noisy products and products that reduce noise
- Low-Noise Emission Products
- Limits for interstate trucks and trains
- Criminal penalties and citizen suits allowed
- Authorization of $24 million over 3 years

(Time limits for all of this)
Tunney to Ruckleshaus (EPA Director):

“A major thrust of the Senate fight for the noise bill was to wrest control from mission agencies and put it squarely in EPA, which has a healthful environment as its primary goal....”
Quiet Communities Act - 1978

- **Rationale:** States & municipalities need more

- **Provisions:**
  - Technical and some financial assistance to states and localities
  - 10 regional technical centers
  - ECHO program
  - Training programs for noise officials
  - Model noise ordinance
  - Buy Quiet recommendations
  - Technical reports
  - Educational activities
  - National Information Center for Quiet
  - Research on noise effects.
Closure

- ONAC targeted by Reagan’s campaign
- OMB ends funding early 1981
- Congress did not repeal – unprecedented

Background
- Unhappiness of the regulated
- Controversies - strong personalities, divergent approaches
- Deadlines missed
- Politics
Stated Rational for Closure:

Noise control should be carried out by state and local governments.
Noise Effects

- Hearing Loss
- Communication Interference
- Performance
- Sleep
- Extra-Auditory Health Effects
- Annoyance (Aversion)
Hearing Loss

- Total number of Americans exposed to potentially hazardous levels? No reliable estimate

- Occupational noise
  - 5.5 million >85 dBA in manufacturing
  - 9 million all occupations
Hearing Loss

**Daily average noise levels producing hearing impairment by exposure level:**

- 90 dBA 15-30% exposed population
- 85 dBA 5-15%
- 80 dBA 0-5%
- 75 dBA safe for 8-hour exposure
- 70 dBA safe for 24-hour exposure
Communication Interference

Major element in individual and community reaction to noise

- TV, radio, music
- Casual conversation
- Warning sounds
  - Approaching car or truck
  - Important in workplace, especially construction
  - Hearing protectors not satisfactory solution
EPA Criteria for Communication

Identified safe levels:

- Home DNL 45 dB
- Outdoors DNL 55 dB
Performance Effects

Children:
Masking speech in classroom
  ▶ “Jet-pause” teaching
  ▶ Academic performance better in quiet schools
Noise at home ➔ lower performance in school

Task Variables
Complex tasks + noise ➔ performance decrements

After Effects
Lower tolerance for frustration

Social Behavior
noise + lack of control ➔ less helpful behavior
Sleep Disturbance

Most frequent complaint

- EPA identified levels:
  - DNL 45 dB outdoors
  - DNL 35 indoors

- Controversy:
  - Average level could be higher
  - Difference between single events and ambient should not exceed 8-10 dB

- Habituation?
  Subjective, but not physiological
Sleep Disruption - Consequences

Noise affects sleep stage without necessarily awakening

Chronic sleep disruption
  ➔ cardiovascular changes and stress hormones,
  many other health problems.
Extra-Auditory Health Effects

- Cardiovascular effects strongest
  - Noise as a stressor → blood pressure increases
  - Effects appear to be chronic
  - Animal and human studies

- Blood chemistry
  - Magnesium metabolism affected
  - Serum cholesterol and glucose levels ➜

- Interactions with noise aversion
  - “Annoyance,” sensitivity
  - Level of personal control

- Recent research
  - Sørensen et al. 2012
  - 12% higher risk of heart disease with each 10 dB increase in LDEN above 50 dB
  - Higher risk of MI
Annoyance

Measure of community response to survey questions

- Used to predict community’s reaction to new or expanded noise sources
- Tradition from 1950s and 1960s
- Better terms:
  
  Aversion, distress, disturbance, dissatisfaction

- Annoyance can mean significant degradation of quality of life.
- No habituation
- Relationship between aversion to noise and physiological effects
Current Criteria

- **EPA’s Criterion for identified Level of DNL 55 dB:** “Highly Annoyed”
  (not slightly or moderately)

- **Inter-Agency Committee on Urban Noise:**
  - DNL <55 “minimal”
  - DNL 55-65 “moderate” (but acceptable for HUD land-use planning)

- **FAA’s Criterion:**
  DNL 65 point above which residential land-use is “normally unacceptable”
  <65 airports not required to draw noise contours for receiving Part 150 grants
  Must show 65, 70, and 75 DNL contours
## Community Reaction as a Function of Outdoor DNL
From EPA’s Levels Document, 1974

<table>
<thead>
<tr>
<th>DNL, Day-Night Sound Level</th>
<th>Percentage complaining</th>
<th>Percentage highly annoyed</th>
<th>Organized community reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 dB</td>
<td>1%</td>
<td>17%</td>
<td>none</td>
</tr>
<tr>
<td>60 dB</td>
<td>2%</td>
<td>23%</td>
<td>some</td>
</tr>
<tr>
<td>65 dB</td>
<td>5%</td>
<td>&gt;33%</td>
<td>vigorous</td>
</tr>
</tbody>
</table>
Summary

- The Noise Control Act was enacted to promote an environment free from noise that jeopardizes the public health and welfare.
- The Act still exists but is not implemented because it is not being funded.
- One of the reasons why the NCA was enacted was because states and municipalities were unable to solve their noise problems.
- One of the reasons why ONCA was closed was to give the responsibility back to the states and municipalities.
- The adverse effects of noise are multiple and serious and they do not appear to be decreasing.
Conclusions

- **Cardiovascular effects**
  Evidence from recent research is much stronger because of carefully controlled prospective studies.

- **Public health perspective**
  Noise given more importance than it gets from occupational health perspective

- **Regulatory and bureaucratic perspective**
  Lack of advocacy within EPA

- **Barrier – significant**
  Noise culture

- **Move forward**
  Leadership needed
Using the law to protect public health from environmental noise pollution

Monica S. Hammer, J.D., Robert Wood Johnson Foundation Visiting Attorney, Network for Public Health Law Mid-States Region

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What’s at stake

- Lack of federal guidance
- Technological complexity
- Law uninformed by science
- Lost opportunity to protect health
The lay of the land

Government Activity: Over 130 units of government discussed whether to pass new or adjust existing laws to limit community noise in less than 6 months.

Enforcement: New York City receives over 40,000 complaints a year related to noise.
Legal principles at play

Public Nuisance  First Amendment  Preemption  ACA implications
Is government action warranted?

The dangers of the nanny state

The importance of public health

Epidemiological data

Personal Responsibility

Individual Powerlessness

Public Nuisance as litmus test: Does noise create a negative externality inflicted on the public **without consent**? And is this negative externality an epidemiological **harm** for which causation can be established at the **population level**? Lindsay F. Wiley, *Rethinking the New Public Health*, 69 Wash. & Lee L. Rev. 207 (2012).
And public nuisance may not be the only reason to act...

Mp3 players at maximum volume can damage hearing in a manner of minutes.

Mp3 players have grown in popularity in recent years.

If ambient sound levels are loud, mp3 users turn up the music to compensate. (*J Pediatr*. 2009; 155(4):550-555)

Between 16 and 19% of adolescents have noise induced hearing loss.

Should we encourage wellness by making the healthy choice the easy choice for vulnerable populations?
First Amendment and overreaching


Purple Pelican v. Ocean Springs Miss., 1:12CV97-LG-JMR (2013) noise ordinance that limits noise that “injures, or endangers the comfort, repose, health, peace, or safety of a reasonable person of normal sensitivities within the area of audibility or perceptibility of the noise or vibration without consent…” not overly vague.

Hassay v. Ocean City, 2013 CV 1076 (2013): whether municipal 30 foot rule in public spaces restricts music more heavily than other forms of speech. Preliminary injunction pending…
Preemption and cooperative federalism

- No state or political subdivision may adopt any law which sets a limit on noise which is not identical to EPA limit with respect to any product for which a regulation has been prescribed. 42 USCA 4905 (e)(1)

- And yet… EPA only limits noise on air compressors, motorcycles, and heavy/medium trucks. 40 CFR 204.1, 40 CFR 205.1

- So… Nothing precludes the right of any state or political subdivision to establish controls on environmental noise on one or more sources through licensing, regulation, or restriction of the use, operation, or movement of any product. 42 USCA 4905 (e)(2)

- However…other laws may preempt local action. Burbank v. Lockheed, 93 S.Ct. 1954 (1973)
Affordable Care Act (ACA) and Prevention

- National Prevention, Health Promotion and Public Health Council to coordinate federal prevention, wellness, and public health activities and develop national strategy to improve nation’s health aimed at reducing chronic disease rates and addressing health disparities. 42 USC 300u-10
What does success look like?

FEDERAL leaders…
- National Park Service soundscape management
- National Oceanic Atmospheric Administration mapping

STATE interventions…
- Hawaii Department of Health conducts monitoring and assessment to ensure a classroom environment conducive to learning
- Washington State law (and a few others) mandate health impact assessments related to noise on transportation projects

MUNICIPAL interventions…
Managing Noise in San Francisco
June M. Weintraub
San Francisco Department of Public Health

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Principal Activities of SFDPH

- Enforce local regulations regarding fixed-equipment noise, such as ventilation equipment, generators, and compressors.
- Review planning, policy decisions, as well as mitigation measures for redevelopment projects.
- Maintain the city's background noise map.
Multi-agency Roles in Noise Control

Article 29 of the San Francisco Police Code

SFDPH
- Noise from mechanical fixed noise sources
- Amplified sound from open top tour buses

Department of Planning
- Violation of conditions of approval (includes noise)
- Environmental review of plans and projects

Department of Building Inspection
- Regulation of construction noise

Entertainment Commission
- Regulation of entertainment noise (nightclubs)

Department of Public Works
- Street opening
- Regulation of construction noise

Police Department
- Regulation of noise from audio equipment
- Regulation of noise from people or animals
Article 29 General Requirements

- Established a three-year Noise Task Force
- Requires DPH to play a leadership role in citywide noise problems
- For three years, report annually to Board of Supervisors
2909  (d)  **Fixed Residential Interior Noise Limits.** In order to prevent sleep disturbance, protect public health and prevent the acoustical environment from progressive deterioration due to the increasing use and influence of mechanical equipment, no fixed noise source may cause the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to exceed 45 dBA between the hours of 10:00 p.m. to 7:00 a.m. or 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed.
City wide noise map
Noise Level Limits - Residential

- May not exceed 5 dBA at property plane of residence

- Multifamily residential may not exceed 5 dBA in adjacent dwellings with windows closed
Noise Level Limits - Commercial

- May not exceed ambient by more than 8 dBA at property plane of the commercial noise source
- May not exceed “low frequency ambient” by more than 8 dBC
Noise Level Limits - Public Property

- May not exceed ambient by more than 10 dBA at 25 feet from the source.
Mechanical Noise Interior Noise Limit

- No mechanical fixed noise source may cause the interior noise level of a residential dwelling to exceed 45 dBA at night and 55 dBA in daytime.

*Night is defined as 10 PM to 7 AM*
Waste Collection Noise

- Time of garbage activity regulated by DPH
- Mechanical and hydraulics of trucks may not exceed 75 dBA at 50 feet. Does not apply to dropping or mixing.
Permitted Noise Sources

Noise sources that take place under permit from a City Department are not subject to the noise ordinance if the permit contains specific noise conditions.

- Concerts in public parks
- Building construction
- Union Picketing
- Nightclubs
Variances

Variances may be granted by Department Heads that regulate the specific noise and the decision may be appealed to the Board of Permit Appeals.

- Chief of Police
- Director of Public Health
- Director of DBI
- Director of Public Works
- Director of Entertainment Commission
Penalties

- Criminal-infraction-$100, $200, $300 in one year.
- Administrative Code, Chapter 100, Section 2916
Environmental Health

Noise Enforcement Program

The Noise Program enforces noise control requirements on mechanical and other fixed noise sources in San Francisco to reduce annoyance, sleep disturbance, and a variety of health problems associated with stress responses to noise. The program also reviews transportation and land use plans and projects in order to reduce the incremental growth of background noise levels in San Francisco.

Principal Activities and Services
- Enforce local regulations regarding fixed-equipment noise, such as ventilation equipment, generators, and compressors.
- Review planning, policy decisions, as well as mitigation measures for redevelopment projects.
- Maintain the city’s background noise level map.

Click here for detailed descriptions of different types of noise and the City and County of San Francisco response.

Making a Complaint

The Environmental Health Section investigates complaints regarding fixed mechanical noise sources such as rooftop air conditioning units, restaurant ventilation systems, motors, and compressors. For more information on how to report a complaint to the health department, click here.

Environmental Health inspectors will go to the noise source and take noise measurements to see if the noise levels exceed the allowable limits. If the noise levels are above acceptable limits, inspectors will require the property owner of the noise source to make sure they are compliant.

Related Agencies

The following agencies are also responsible for noise control and prevention. Please contact the appropriate agency based on the issue:
- Department of Planning
  - Violation of conditions of approval (includes noise)
  - Environmental review of plans and projects
- Department of Building Inspection
  - Regulation of construction noise
- Entertainment Commission
  - Regulation of entertainment noise (nightclubs)
- Department of Public Works
  - Street noise
  - Regulation of construction noise
- Police Department
  - Regulation of noise from audio equipment
  - Regulation of noise from people or animals

Planning, Policy and Research

For more information on the noise program activities around planning, policy and research please visit the Program for Health, Equity and Sustainability.

http://www.sfdph.org/dph/EH/Noise/
Citizen’s Guide to Noise Prevention and Control

**A CITIZENS’ GUIDE TO NOISE PREVENTION AND CONTROL**

With its diverse and active population, proximity of homes to businesses, urban traffic, and construction, San Francisco can be a noisy place. Noise is inevitable in cities, yet noise levels found in some parts of San Francisco are high enough to seriously harm health and quality of life, challenging hearing, speech, and sleep and potentially causing physiological and psychological stress, heart disease, and high blood pressure. Even a city with density and activity can take steps to limit noise. This document provides a simple guide to residents about the City’s roles in preventing and controlling noise.

Federal, state and local law limit noise from transportation, construction, mechanical equipment, entertainment, and human behavior. In 2008, the City updated its noise law (Article 29 of the Police Code) to manage noise problems anticipated with population growth and mixed-use zoning. The Department of Public Health, through its Noise Control Officer, coordinates the implementation of the City’s noise control laws working with the Police Department, the Department of Building Inspection, the Department of Public Works, and the Department of City Planning. These agencies collectively share the responsibilities for noise control and prevention, with Building and Planning working to prevent and mitigate new noise conflicts and Health, Police, Building and Public Works responding to noise concerns when they occur.

Many noise problems can be resolved with common sense and common courtesy. Everyone can take steps to make sure that personal and business activities do not make noise problems worse in our communities. For example, people can limit the volume on televisions or musical instruments, or be thoughtful about when using power tools.

The city can help residents find solutions to noise problems. Calling 311 will direct residents’ concerns to the appropriate city agency. Residents can also contact the responsible agency directly. The table on the next page describes the roles of city agencies in noise prevention and control.

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**Noise Issue**

<table>
<thead>
<tr>
<th>Land Use Compatibility</th>
<th>Noise from Machines and Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business including markets, restaurants, bars, shops, and various service providers can generate noise conflicts because of delivery vehicles, ventilation or refrigeration equipment, the use of power tools and machines, and musical equipment.</td>
<td>Construction can be noisy because of heavy equipment such as pile drivers and bulldozers, as well as noise from excavation, and trucks, particularly when it occurs during evening and morning hours.</td>
</tr>
</tbody>
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<tr>
<th>Noise in Residential Interiors</th>
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</thead>
<tbody>
<tr>
<td>Noise in residential interiors comes from sources in the building such as other occupants or building residents, or from external sources such as traffic, restaurant patios or local blowers.</td>
<td>California State law requires all multi-family residential buildings to meet strict indoor noise standards at 45 dBA (dB-A). Depending on the location, buildings must perform an acoustical evaluation and design plans for sound isolation. The Department of Building Inspection encourages the design, building, and inspection of buildings after occupancy. The Department of Public Health and enforces an indoor noise standard on residences.</td>
</tr>
</tbody>
</table>

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<tr>
<th>Garbage Collection</th>
<th>Tour Buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting and removing garbage, recyclables, and compost is an essential public health service but moving refuse containers and operating noise vehicles can be very loud.</td>
<td>The amplified sound systems on open top tour buses can impact nearby residents and businesses.</td>
</tr>
</tbody>
</table>

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<tr>
<th>General Traffic Noise</th>
<th>Entertainment</th>
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<tr>
<td>Traffic is the single most important contributor to ambient noise levels in San Francisco and is most intense near highways and arterial streets.</td>
<td>Amplified sound systems in bars, restaurants, and clubs create entertainment noise. Outdoor gatherings and events also create a great deal of noise.</td>
</tr>
</tbody>
</table>

**What the City Can Do**

- Implementing the policies in the San Francisco General Plan, the Department of City Planning regulates land use to avoid incompatibilities due to noise.
- Where a new use has a noise conflict with an existing use, the Department of City Planning may require the implementation of controls to reduce noise impacts, including buildings on the location, or timing of specific equipment or activities. The Department of Building Inspection can ensure equipment is selected and installed to be as quiet as possible.
- The Department of Building Inspection and the Department of Public Works regulate noise from construction equipment. The city requires a permit from these agencies for construction before 7am or after 8pm. The Department of Public Works, Street Division manages complaints about construction on public streets and right of ways.
- The Department of City Planning and the Department of Building Inspection studies developers, builders, and businesses show noise levels and how to avoid new noise conflicts. For example, by installing quieter equipment or by moving the location of noisy equipment. The Department of Public Health responds to complaints, monitors noise from construction equipment, and takes enforcement action if noise levels exceed legal limits.
- The Department of Public Health issues permits for collection vehicles, for compliance with noise standards. The Department of Public Health also decides, with the city’s garbage company, on timing garbage collection to minimize noise impacts.
- The Department of Public Health inspects permit collection vehicles for compliance with noise standards. The Department of Public Health also decides, with the city’s garbage company, on timing garbage collection to minimize noise impacts.
- The Department of Public Health inspects open-top tour buses to ensure that their sound systems are not audible from 30 feet away. The Police Department keeps complaints about these buses.
- Both Federal and State agencies limit how much the city may be entered by motor vehicle engines. No limit for the number of vehicles on a street. However, the city can purchase vehicles (e.g., electric and hybrid bus), promotes public transit, controls vehicle speed, and requires noise to limit traffic noise. The city also bans the use of alarms, announcements, and backup horns on non-road vehicles, trucks, buses, and garage doors. The Department of Public Health responds to complaints about outdoor traffic noise.
- The Entertainment Commission monitors noise from entertainers venues and requires mitigation to avoid problems. The Parks and Recreation Department requires noise in parks. Most outdoor public events require a permit which can include noise limits and times of operation. Current law on not permit the city to require street entertainment. |
Harnessing the Power of Procurement to Improve Food Environments

Q&A

Type your question in the Q and A panel.