Introduction to Environmental Health and Policy

November 29, 2021
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Kathryn Santoro, M.A.
Director of Programming
National Institute for Health Care Management (NIHCM) Foundation
What are the impacts of a changing environment on human health?

Climate change has intensified environmental health concerns over the last several decades, resulting in more people being exposed and brought closer to environmental hazards:

- **Increases in the frequency, intensity, and duration of extreme heat**
  - Extreme heat is one of the leading causes of weather-related deaths in the U.S. It has been estimated that as many as 1300 people die from heat each year.
  - Heat stress, heat stroke, and cardiovascular ailments worsened by heat cost the health care system $263 million per year.

- **Changes in the distribution & burden of vector-borne diseases & water-borne infectious diseases**

- **Occupational health risks**

- **Population displacement from rising sea levels**
  - Flooding and storm surges associated with sea level rise will affect 20 million Americans and can harm sewage systems and threaten drinking water.

- **Increases in noncommunicable diseases and disorders like respiratory diseases, heart disease, depression, and mental disorders**

Researchers expect that the health impacts of climate change and the resulting environmental health challenges will be distributed unevenly and preexisting health inequality will be made worse.

Full citation and full infographic available at www.nihcm.org
Panelists

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Environmental Health Briefing: Introduction to Environmental Health and Policy

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Multisector Influences on Health
What is Health Equity?

Health Equity = Everyone has a fair opportunity to live a long and healthy life.

https://www.rwjf.org/content/rwjf/en/library/research/2017/05/what-is-health-equity-.html;
https://images.app.goo.gl/TjfqKjasw21GTQNYA
Health in All Policies (HiAP)

- HiAP is a collaborative approach that involves multiple sections and systematically takes into account the health implication of decisions to improve population health and well-being and health equity

- Data driven approach

- Systems level change

- Seeks synergies and involves collaboration

Tools and Tactics to Achieve HiAP

- Creating cross-sector government structures
- Integrating health into planning processes including zoning updates and General Plans
- Integrating health language into request for proposals (RFPs)
- Developing health-related grant scoring criteria
- Using Health Impact Assessment (HIA) and related tools (e.g., health notes)
Examples: Environmental Health in All Policies

- Housing policy
- Food policy
- Water policy
- Transportation policy

https://www.astho.org/Programs/HiAP/Environmental-HiAP/
Lynn Goldman, M.D., M.S., MPH
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Environmental Health Policy
Health

• In 1945, the World Health Organization (WHO) defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."
Goals of Environmental Health

• Establish and maintain a healthy livable environment for humans and other species

• Promote an environment that improves well-being and a high quality of mental health

• Allow the environment to be sustainable for the future, YET, allow a setting for population growth, manufacturing, and agriculture today to thrive
Components of Environmental Health

• Natural environment
• Built environment
• Social environment
Environmental protection prolongs life
Reasons for long-term gains in life expectancy

• Sanitation – thereby reducing death by infectious and other diseases especially infant mortality
• Food – more nutritious and safer food
• Clean air – reduction in air pollution
• Maternal and infant care
• Immunizations
• Antibiotics
• Many other interventions including health care
Some Principles in Environmental Policy

• Prevention as the tool of first resort (or cleanup as a tool of last resort)

• Environmental justice

• Children’s health and intergenerational equity

• Ecosystem/community protection

• Considerations of cost, cost effectiveness and who pays (Polluter pays)
Environmental Health Policy Operates at Multiple Levels

• Global – e.g., climate pollution, persistent pollutants
• National – e.g., air pollution, chemicals, pesticides, water, waste
• State & Local
• Nongovernmental – e.g., ESG (Environmental, Social and Governance) policies
• Individual – e.g., household energy use, recycling, consumer choice
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Lead’s Lessons For Environmental Public Health Policy

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The purpose of public health is to fulfill society’s interest in assuring the conditions in which people can be healthy.
In the late 1960s Childhood Lead Poisoning was an Insurmountable Challenge

- Lead was everywhere
- Only Blood Leads over 60 mcg/dl were thought to be Toxic
- Average Blood Lead in the US was about 22 mcg/dl
- Large Eastern cities ~10 Lead Poisoning Deaths per year
- Many Children In Hospitals for Treatment
Lead Paint
Especially on Windows and friction surfaces
Lead in Paint
US
1900-1930

2 pounds of lead per person per year 1900-1930

Lead as kilotons of lead per 1 million population.

The Drop of Solder...

evaporated milk

that puts a cow in your kitchen cupboard
“Cater to the Children”: The Role of The Lead Industry in a Public Health Tragedy, 1900–1955

Gerald Markowitz, PhD, and David Rosner, PhD, MSPH

According to the Centers for Disease Control and Prevention, it is estimated that 1 of every 20 children in the United States suffers from subclinical lead poisoning,1 and a recent article in Science argues that “paint appears to be the major source of childhood lead poisoning in the United States.”2 Yet it is only during the past 15 years that the history of this tragic situation has been addressed in any detail.3,4,5 Primarily through the documentation of childhood lead poisoning, health and medical historians have traced the 20th century’s influence of the trade in lead and lead paint.6

Medical Knowledge of the Dangers of Lead-Based Paint

Historians have shown that knowledge of the dangers of lead poisoning to workers and children can be traced back into the 19th century.7 The lead industry has tried to shift the blame for childhood lead poisoning onto workers and children by identifying laborers and children as“... and how is mother today, Alice? ”

1918 Dutch Boy Painter Ad
Addition of tetraethyl lead at ~2.5 grams per gallon began in the 1930s. (12 gallons of gasoline had one ounce of lead)
US Gasoline Lead Exposure 1960-1974

e.g. Each year Texas Used Six pounds of Lead in Gasoline per Texan

kilotons per million persons per year by state"
Lead as kilotons of lead per 1 million population.

Children who had survived lead poisoning were not “fine”
Human Brain Development

Synapse Formation Dependent on Early Experiences
(700 per second in the early years)

- Sensory Pathways (Vision, Hearing)
- Language
- Higher Cognitive Function

FIRST YEAR

-8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Birth (Months) (Years)

Children Take in More Air, Water and Food Per Pound Than Adults

- 2 times resting air intake
- 3 times skin absorption
- 3 times water intake
- 3 - 4 times food intake

“Children Are Not Little Adults”
DEFICITS IN PSYCHOLOGIC AND CLASSROOM PERFORMANCE OF CHILDREN WITH ELEVATED DENTINE LEAD LEVELS

HERBERT L. NEEDLEMAN, M.D., CHARLES GUNNOE, Ed.D., ALAN LEVITON, M.D., ROBERT REED, Ph.D., HENRY PERESIE, Ph.D., CORNELIUS MAHER, Ph.D., AND PETER BARRETT, B.S.

Abstract To measure the neuropsychologic effects of unidentified childhood exposure to lead, the performance of 58 children with high and 100 with low dentine lead levels was compared. Children with high lead levels scored significantly less well on the Wechsler Intelligence Scale for Children (Revised) than those with low lead levels. This difference was also apparent on verbal subtests, on three other measures of auditory or speech processing and on a measure of attention. Analysis of variance showed that none of these differences could be explained by any of the 39 other variables studied.

Also evaluated by a teachers' questionnaire was the classroom behavior of all children (2146 in number) whose teeth were analyzed. The frequency of nonadaptive classroom behavior increased in a dose-related fashion to dentine lead level. Lead exposure, at doses below those producing symptoms severe enough to be diagnosed clinically, appears to be associated with neuropsychologic deficits that may interfere with classroom performance. (N Engl J Med 300:689-695, 1979)

THE neurotoxic properties of lead at high dose are well known and not a subject of general concern. However, low dose exposures, which may not be representative of the population in clinics, schools for the retarded or psychiatric clinics
Figure 2. Distribution of Negative Ratings by Teachers on 11 Classroom Behaviors in Relation to Dentine Lead Concentration. The group boundaries were chosen to obtain symmetrical cell sizes for the median (Groups 1 and 6 = 6.8 per cent, Groups 2 and 5 = 17.6 per cent, and Groups 3 and 4 = 25.6 per cent).
Downtown Los Angeles 1960s
Lead Ruins Catalytic Convertors… California Required Unleaded Gasoline
Lead as kilotons of lead per 1 million population.

Society Benefits from Preventing Lead Exposure

Reducing blood lead levels by 10 μg/dL raises IQ by 2.6 (1.9-3.2) points

Economic Value of an IQ Point

$14,500
($12,700 - $17,200)

(in year 2000 dollars)

Economic Benefit of Preventing Lead Exposure in U.S. Cohort

Annual cohort of children reaching age 2: 3.8 million

Estimated benefit per each year’s cohort: $213 billion

($110 - $318 billion)

Environmental Health Perspectives 110:563-569 (2002).
These data convinced governments to cease using leaded gasoline.
We value your input!

Please fill out the evaluation survey you will receive immediately after this presentation, or via email this afternoon!
Upcoming Event

Policymaking to Support the Health of Native American People

12:00 pm – 1:00 pm ET

https://register.gotowebinar.com/register/73547117623222236429
Learn More

Additional resources available online »

• Full speaker bios
• Resources list
• Expert list
• Presentation slides
• Recording

www.allhealthpolicy.org
Thank you for attending.