Webinars
Series of scientific webinars that provide a forum for discourse on scientific issues.
Live and On-Demand
Case Conferences
Journal Clubs
Grand Rounds
CE Available

Online Courses
Evidence-based online courses on a variety of children’s environmental health topics.
Interactive and Self-Paced
CE Available

Resource Catalog
Fact sheets, journal publications, reports, and other resources for parents, community members, patients and healthcare professionals
Topics included:
Air Quality, Pesticides, Natural Disasters, BPA, Mold, Lead, Mercury
Ecology of Children's Environmental Health Disparities

Leslie Rubin MD
Morehouse School of Medicine
Developmental Pediatric Specialists
Innovative Solutions for Disadvantage and Disability
Southeast Pediatric Environmental Health Specialty Unit at Emory University
Disclaimer

- This material was supported by the American Academy of Pediatrics (AAP) and funded (in part) by the cooperative agreement FAIN: 1U61TS000237-03 from the Agency for Toxic Substances and Disease Registry (ATSDR).

- Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing partial funding to ATSDR under Inter-Agency Agreement number DW-75-95877701. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.
Objectives

- Review impact of adverse environmental effects of poverty on children's health and development
- Understand ecology of environmental health disparities in the context of a cycle
- Explore strategies to reduce environmental health disparities and promote children's health and development
- Examine the Break the Cycle Program as a leadership development model to reduce children's environmental health disparities
Children at most risk for health disparities

- Poverty
- Lead & other toxins
- Exposure to Tobacco Smoke
- Unsafe neighborhood
- Stressed Single Mother
- Experiencing Violence
- Insecurity & Anxiety
- Limited Access to Healthcare

Health Equity and Children's Rights *Pediatrics*; March 29, 2010;
Poverty Disparities

- **Race:**
  - 12.3% of white children
  - 31.9% of Hispanic children
  - 37.1% of black children

- **Education:**
  - some college education, 13% are poor
  - less than a high school degree, 57% are poor

- **Employment:**
  - 1 parent works full-time, 9% are poor
  - no parent works full-time, 48% are poor

Mediators of Child Poverty Pascoe et al Pediatrics April 2016
The absence of fathers in the home is associated with a fourfold risk of poverty.

- 42% of single female-headed families are poor
- 12% for 2-parent families

Children of single mothers are at greater risk for:

- infant mortality
- child maltreatment
- failure to graduate from high school
- incarceration

Mediators of Child Poverty Pascoe et al Pediatrics April 2016
Built Environment in Poor Communities

- Unsafe Neighborhoods due to: Traffic, Crime, Litter & Trash, Food Desert, Limited Green Space
  - 61% more likely to be Obese

- Older Houses in Poor Condition
  - 3.5x more likely to have lead toxicity

- Older Schools in Poor Condition
  - 50% less likely to graduate
  - 2x more likely to be unemployed
the condition of building features in schools with the highest concentration of poverty are less than adequate compared to schools with the lowest concentration of poverty.
Graduation from High School

Graph showing graduation rates in inner city and suburban schools.

- Inner city graduation rate: 50
- Suburban graduation rate: 79
Smoking Prevalence and Education

- 5.6 percent with a graduate degree
- 9.1 percent with a college education
- 24.2 percent who do not graduate from high school

CDC, MMWR, 63(No. 47):1108-1112, November 28, 2014
Asthma and Equity

- CDC Morbidity and Mortality report:
  - Smoking in the home is highest among black people & people with low incomes
- Asthma inequity in blacks compared to whites
  - prevalence 2x as high
  - mortality 3x as high,
- Asthma hospitalization among Medicaid children:
  - 93% in black
  - 34% in Hispanic

MMWR January 14, 2011
Adverse Childhood Experiences and Toxic Stress

- occurs when a child experiences strong, frequent, and/or prolonged adversity
- such as physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family economic hardship
- without adequate adult support.

Childhood Adversity and Toxic Stress Pediatrics 129:1 January 2012
Impact on Brain Function

- Disorders of learning, memory and executive function
- Impaired decision-making
- Behavioral self-regulation
- Mood and impulse control
- Risk-taking behaviors
Long Term Outcomes

- School failure
- Unemployment
- Poverty
- Homelessness
- Substance abuse
- Gang membership
- Violent crime
- Incarceration
- Being single parents
Poor Health Outcomes

- Alterations in immune function and measurable increases in inflammatory markers, increasing risk for:
  - obesity
  - diabetes
  - hypertension
  - stroke
  - early death
Children: Poverty & Vulnerability

<table>
<thead>
<tr>
<th>Child Outcomes</th>
<th>Risk for poor children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child abuse and neglect</td>
<td>6.8</td>
</tr>
<tr>
<td>Lead Poisoning</td>
<td>3.5</td>
</tr>
<tr>
<td>Birth to unmarried teenager</td>
<td>3.1</td>
</tr>
<tr>
<td>Depression</td>
<td>2.3</td>
</tr>
<tr>
<td>Experiencing violent crimes</td>
<td>2.2</td>
</tr>
<tr>
<td>Short-stay hospital episode</td>
<td>2.0</td>
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<tr>
<td>Grade repetition and high school dropout</td>
<td>2.0</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>1.9</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>1.7</td>
</tr>
</tbody>
</table>

From Neurons to Neighborhoods IOM 2000
Sociodemographic factors and environmental influences in early childhood have been demonstrated to have significant impact on development, mental health, and overall health throughout the lifespan.
Ecology of Environmental Health Disparities

Cycle of Environmental Health Disparities

Compounding Factors
- Limited Educational Services
- Limited Health Care Services
- Limited Social Capital

Social & Economic
- Limited Education
- Limited Employment Options
- Limited Empowerment
- Limited Income

Health Risk Factors
- Pregnancy Vulnerability
  - Poor Prenatal Care
  - Intrauterine Insults
  - Low Birth Weight & Prematurity
- Physical Health
  - Neurodevelopmental Disorders
  - Asthma & Allergies
  - Obesity & Hypertension
- Mental Health
  - Toxic Stress & PTSD
  - Substance Abuse
  - Violence & Crime

Residential Options
- Limited Choice
- Limited Infrastructure
- Limited Services

Residential Characteristics
- Older Houses
- Adverse Environmental Factors
- Adverse Social Factors

Environmental Impact
- Increased Toxins
- Increased Stress
Can we make a Difference?

• Absolutely!!!!!!
• Positively!!!!!!
a Low licking and grooming

NGFI-A

\[ \rightarrow \]

Nr3c1

\[ \rightarrow \]

\[ \downarrow \text{GR expression} \]

High corticosterone levels
High anxiety
Low licking or grooming

b High licking and grooming

NGFI-A

\[ \rightarrow \]

Nr3c1

\[ \rightarrow \]

\[ \uparrow \text{GR expression} \]

Low corticosterone levels
Low anxiety
High licking or grooming
- Impact of EI on children of high resource (HR) & low resource (LR) families
- LR children displayed greater improvement with EI than HR children
- LR children receiving EI did not differ significantly from HR children

Early Intervention and Cognitive Development PEDIATRICS 137:4, April 2016
Home-Based Early Intervention

Early Intervention and Cognitive Development PEDIATRICS 137:4, April 2016
The Perry Preschool Program

- Poor children with low IQ
- Beginning at age 3 and lasting 2 years:
  - 2.5-hour preschool program weekdays during the school year,
  - supplemented by weekly home visits by teachers
- Follow-up at ages 15, 19, 27, and 40

The Perry Preschool Program

A. Data from the Perry Program collected when the individuals were 27 years old (High/Scope). >10th percentile achievement indicates children who scored above the lowest 10% on the California Achievement Test (1970) at age 14; HS Grad indicates number of children who graduated High School on time.
“Our estimate of the overall social rate of return to the Perry program is in the range of 7% to 10%”

Value-Added Teachers & Student Outcomes

- Researchers in Economics at Harvard and Columbia universities
- Tracked one million children from a large urban school district from 4th grade to adulthood looking at the outcomes of having a Value-Added Teacher

Rates of return to human capital investment

- Preschool programs
- Schooling
- Job training

Rate of return to investment in human capital

Preschool
School
Post-school

Age

Skill Formation and the Economics of Investing in Disadvantaged Children
James J. Heckman in: Science June 30, 2006 VOL 312 page 1900
A Leadership Development Program of:

PEHSU
Southeast Pediatric Environmental Health Specialty Unit

EMORY University

isdd
INNOVATIVE SOLUTIONS FOR DISADVANTAGE & DISABILITY
Requirements from Break the Cycle Students

- Recruit Students from a variety of universities and disciplines to:
  - Develop a project
  - Identify a mentor
  - Conduct the study
  - Present results at a conference
  - Write a manuscript for publication
**Cycle of Environmental Health Disparities**

**Compounding Factors**
- Limited Educational Services
- Limited Health Care Services
- Limited Social Capital

**Social & Economic**
- Limited Education
- Limited Employment Options
- Limited Empowerment
- Limited Income

**Residential Options**
- Limited Choice
- Limited Infrastructure
- Limited Services

**Health Risk Factors**
- Pregnancy Vulnerability
  - Poor Prenatal Care
  - Intrauterine Insults
  - Low Birth Weight & Prematurity
- Physical Health
  - Neurodevelopmental Disorders
  - Asthma & Allergies
  - Obesity & Hypertension
- Mental Health
  - Toxic Stress & PTSD
  - Substance Abuse
  - Violence & Crime

**Residential Characteristics**
- Older Houses
- Adverse Environmental Factors
- Adverse Social Factors

**Environmental Impact**
- Increased Toxins
- Increased Stress
Art Works: Converting Issues into Art

‘Mommy’ – a Pregnancy Surveillance System

Family Wellbeing after Relocation from a Distressed Public Housing Development

Learn, Eat, Grow: Healthy Living Initiative

School Readiness in Young Children

An Ecological Model of Healthcare Disparities for Poor Children in The South

Health Vulnerabilities of Utah’s Immigrant Children: Breaking the Cycle

Addressing Social Determinants of Health at a Federally Qualified Health Center

Barriers to Blood Lead Screening Practices Among Healthcare Providers

Access to Early Intervention Services for Preterm Survivors
To Date:
- 11 annual programs
- 10 states in USA, Latin America, Europe & Africa
- 103 students
- 30 university departments

Publications
- 8 international journal supplements
- 8 books
Break the Cycle Outcomes

- Increased Awareness of Children's Environmental Health
- Increased Awareness of Environmental Health Disparities
- Influenced Future Careers

Student Survey in Environmental Health Disparities 2016
We may not be required to complete a task but we are not permitted to desist from undertaking the challenge

Ethics of the Fathers 2:21