Taking an Environmental History to Address Children's Unique Vulnerabilities to Environmental Health Risks

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Health & Environment

A National Environmental Education Foundation Program

Learning Objectives

- At the end of this session the learner will be able to:
  - Define ‘Pediatric Environmental Health’
  - Describe 5 ways in which children are uniquely vulnerable environmental exposures
  - Obtain an efficient Screening Pediatric Environmental Health History (Taking in to account children's unique vulnerabilities)
  - Access additional tools to gather a more detailed environmental history when indicated.

Outline

1. Definition: What is pediatric environmental health?
2. Historical Perspective: The changing pattern of disease in childhood
3. The Theory: Why children are not just little adults when it comes to environmental exposures
4. Evidence that supports this theory of unique vulnerability
5. Incorporating a screening pediatric environmental health history into routine well child care and ill child care

What is Pediatric Environmental Health?

- **Environmental health is the field of science that studies how the environment influences human health and disease**
  - ***NIEHS Definition***

- **“Environmental health includes both the *direct pathological effects* of chemicals, radiation and some biological agents, and the *effects (often indirect)* on health and wellbeing *of the broad physical, psychological, social and aesthetic environment* which includes housing, urban development, land use and transport.”**
  - ***World Health Organization Definition***

What Comprises the 'Environment'

- The natural environment
  - Includes physical, chemical and biological things that occur naturally in our surroundings (air, water, food, soil)
- The man-made or "built" environment
  - Includes physical structures where people live, work and play and the consequences of human alteration to the natural environment (e.g. pollution)
- The social environment
  - Encompasses lifestyle factors such as diet and exercise, SES and other societal influences that may affect health
    - NIEHS

An Operational Definition of Pediatric Environmental Health

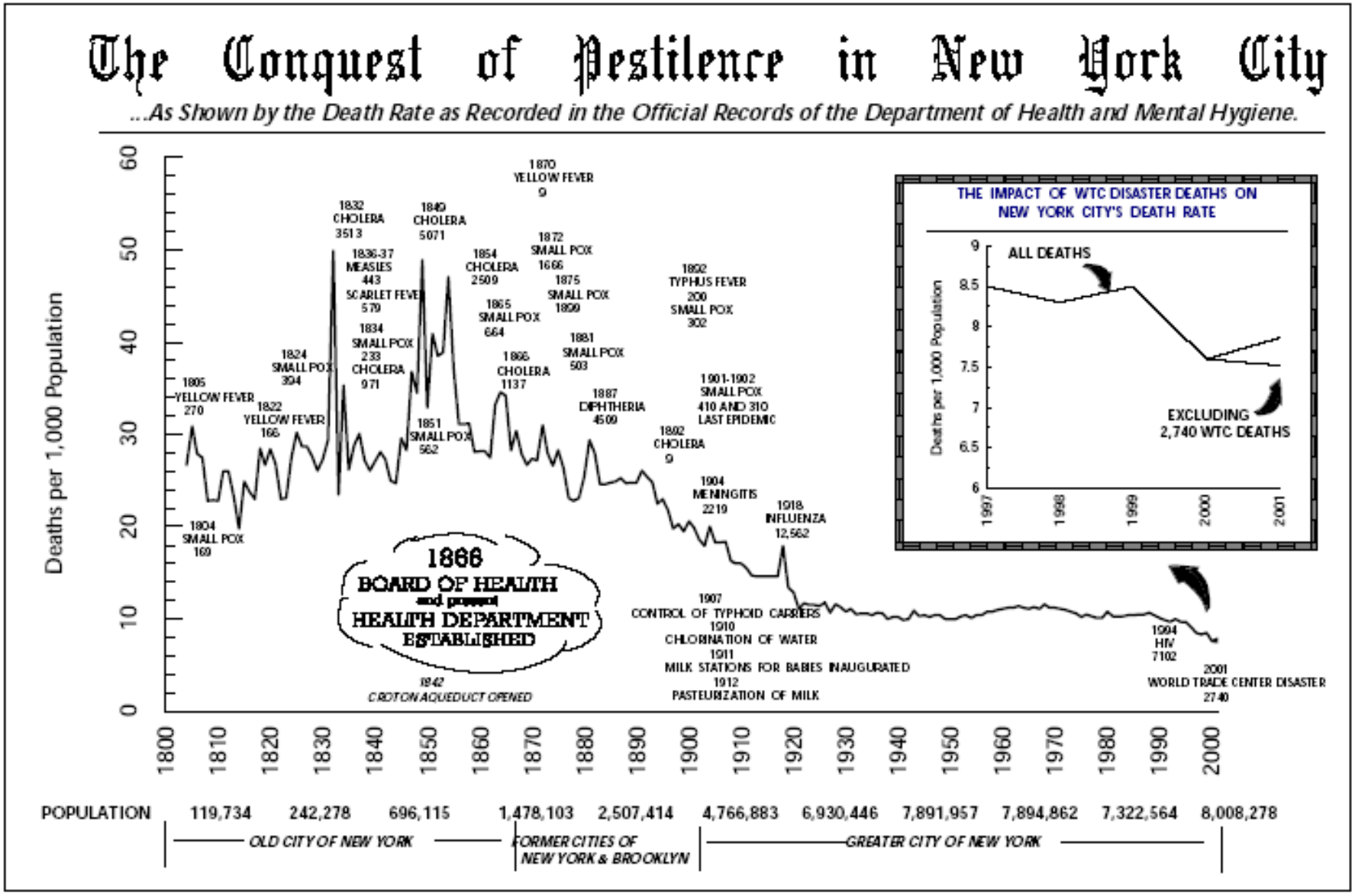
- The *Diagnosis, Treatment, and Prevention of Illness* due to Pediatric Exposure to Environmental Hazards

- The *Creation of Healthy Environments* for Children

Historical Perspective

The changing pattern of disease in childhood

Patterns of Disease in Children Have Changed Greatly in the Past 100 Years



The New Pediatric Morbidity

A range of chronic disabling and sometimes life threatening conditions of complex and poorly defined origins that affect increasing numbers of American children today

- Asthma
- Developmental Disorders
- Obesity
- Endocrine and Sexual Development Disorders
- Cancer

Environmental Exposures Linked To Pediatric Diseases

- Asthma
  - ETS
  - Outdoor Air pollutants (particulates, sulfur dioxide, ozone, etc)
  - Mold
  - Pesticides (Pyrethrins)
- Neurodevelopmental disorders
  - Lead, PCBs, Mercury, Pesticides, CO, Synthetic chemicals
- Obesity
  - Built Environment
- Endocrine disorders
  - Perchlorate, DDT
- Cancer
  - Pesticides, Radon, EMFs, Solvents, Synthetic Chemicals

Environmental Related Disease Is *Expensive*

- The US Department of Education spent $36 billion on special education services in the US in 1996
- Charges for Asthma Hospitalization in NYC for 1 – 4 year olds was $33.4 million in 2000
- Total annual costs are estimated to be $54.9 billion (range $48.8-64.8 billion): $43.4 billion for lead poisoning, $2.0 billion for asthma, $0.3 billion for childhood cancer, and $9.2 billion for neurobehavioral disorders **(Landrigan et al EHP 2002 Jul;110(7):721-8)**

Environmental Exposures Are *Preventable*

- Lead can be abated. Practices that create hazards can be avoided
- CO poisoning can be prevented with inexpensive detectors (New NYC Law 11/1/2004)
- Pesticides can be avoided – IPM
- Less toxic cleaning products can be chosen
- Radon can be detected and remediated
- Mold can be abated and prevented (Moisture control)
- Diet can be altered to reduce mercury and pesticide exposure
- Water can be tested for solvents and treated or replaced

The Theory of Children's Unique Vulnerability

Why children are not just little adults when it comes to environmental exposures

Unique Vulnerabilities of Children

- Children consume more food, drink more water, and breath faster than adults
- Children have unique behaviors, diets, and are closer to the ground
- Children have immature metabolic pathways
- Young children have unique windows of vulnerability – particularly in neurodevelopment
- Children have a very long ‘shelf life’

Greater Exposure

- Children can have greater exposure to environmental toxins than adults.

Pound for Pound of body weight children drink more water,eat more food, and breath more air than average American adults.

Unique Behaviors

- Hand to mouth behavior.
- Children play close to the ground.
- Unique diet.

Immature Metabolic Pathways

- Immature liver enzymes leads to increased blood levels and half-lives
- Well documented for therapeutic drug pharmacokinetics
- Not well studied for environmental toxins

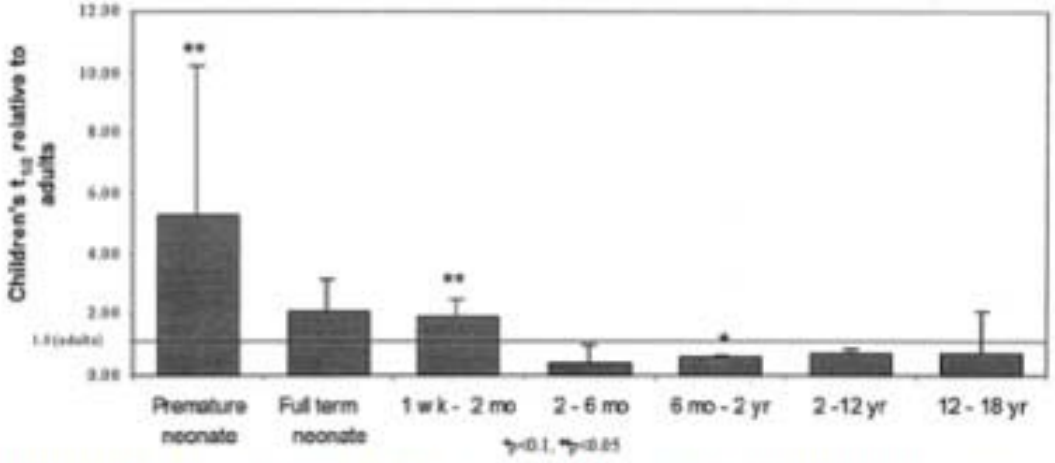
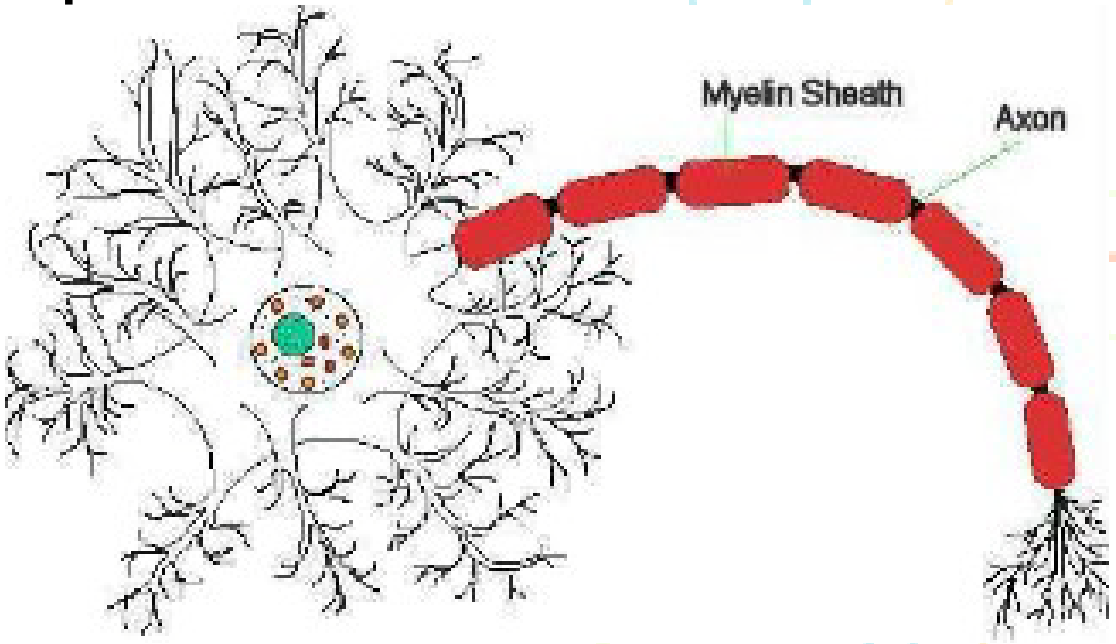


Fig 3. Analysis of children's pharmacokinetic database: half-life results for CYP3A substrates (alfentanil, carbamazepine, fentanyl, lignocaine, midazolam, nifedipine, quinidine, triazolam). Reprinted from Ginsberg et al (2002) with permission from Oxford University Press.

Ginsberg et al. Pediatric Pharmacokinetic Data: Implications for Environmental Risk Assessment for Children, *Pediatrics* 2004; 113: 973 - 983

Windows of Vulnerability

- Young children are undergoing rapid growth and critical neurologic development



A Long ‘Shelf Life’

- Children have a longer “shelf-life.”
  - They have more future years ahead to develop illnesses with a long latency from the inciting or contributing exposure.

Is It Really True?

Recent Evidence That Supports This Theory of Children's Unique Vulnerability to Environmental Toxins

Synthetic Chemicals

- More than 80,000 chemicals registered with EPA
- Greatest risk are 2,863 high-production-volume (HPV) chemicals (produced in amounts of 1 million pounds or more per year)
  - Fewer than half have been tested for Toxicity to Human Health
  - Less than 10% have been tested for pediatric neurotoxicity
- Gaps in knowledge are particularly great in regard to developmental toxicity

Evidence of Children's Increased Exposure

- In the CDC's 3rd National Report on Human Exposure to Environmental Chemicals (part of NHANES) **many chemicals are found in greater amounts in children than adults** suggesting that children really are exposed to a greater degree

http://www.cdc.gov/exposurereport/

DEHP

- Phthalate Plasticizer
- Ubiquitous use
  - Building Materials
  - Clothing
  - Medical Devices
  - Packaging
- Millions of tons produced each year

DEHP

- Potential Health Effects
  - Developmental Toxicity in animal models (rat)
  - Liver Toxicity in animal models
  - Endocrine disruption (sexual differentiation)?
    - Early Thelarche (breast development) associated with phthalate exposure in Puerto Rican girls. **(Colon et al. EHP 2000)**
  - Decreased Testicular weight and atrophy
  - Cancer?

DEHP Exposure Higher in Children

Table 201. Mono-2-ethylhexyl phthalate (creatinine corrected)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999-2002.

	Survey years	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval) 50th	75th	90th	95th	Sample size
Total, age 6 and older	99-00	**3.12** (2.96-3.31)	**3.08** (2.82-3.27)	**5.88** (5.38-6.25)	**10.8** (9.62-12.5)	**18.5** (15.0-21.6)	2541
	01-02	**3.99** (3.57-4.46)	**3.89** (3.42-4.44)	**7.94** (7.14-9.02)	**16.2** (15.4-21.6)	**32.6** (25.2-42.9)	2772
Age group							
6-11 years	99-00	**5.19** (4.56-5.93)	**5.37** (4.62-5.96)	**9.11** (8.06-11.4)	**21.6** (11.5-41.9)	**41.9** (13.5-86.2)	328
	01-02	**5.02** (4.47-5.64)	**5.38** (4.51-6.21)	**9.82** (7.87-11.0)	**20.9** (13.7-28.8)	**31.2** (24.3-40.7)	392
12-19 years	99-00	**2.53** (2.14-2.99)	**2.31** (2.00-2.76)	**5.83** (4.38-6.29)	**9.63** (7.41-11.5)	**12.1** (10.5-17.3)	752
	01-02	**3.53** (3.06-4.03)	**3.62** (2.89-4.48)	**7.45** (6.51-8.67)	**15.2** (11.7-21.9)	**25.2** (17.7-32.8)	742
20 years and older	99-00	**3.03** (2.83-3.26)	**2.98** (2.73-3.23)	**5.55** (4.90-6.06)	**10.0** (9.60-12.9)	**17.5** (13.8-22.1)	1461
	01-02	**3.96** (3.48-4.50)	**3.81** (3.24-4.37)	**7.77** (6.88-9.00)	**18.4** (15.3-22.1)	**33.3** (23.1-47.9)	1638
Gender							
Males	99-00	**2.89** (2.60-3.22)	**2.76** (2.52-2.96)	**5.58** (4.71-6.06)	**10.3** (9.35-12.4)	**21.6** (14.1-27.7)	1215
	01-02	**3.49** (3.06-3.98)	**3.32** (2.76-3.90)	**7.00** (5.46-7.77)	**16.2** (12.9-20.9)	**31.2** (20.1-49.9)	1367
Females	99-00	**3.36** (3.11-3.63)	**3.33** (2.90-3.80)	**6.15** (5.55-6.77)	**11.1** (9.02-14.0)	**16.3** (12.4-24.6)	1326
	01-02	**4.53** (4.01-5.11)	**4.43** (3.79-5.13)	**9.17** (7.93-10.3)	**20.4** (16.6-24.8)	**35.1** (27.7-42.0)	1405
Race/ethnicity							
Mexican Americans	99-00	**3.16** (2.72-3.68)	**3.15** (2.62-3.81)	**5.88** (4.86-7.24)	**11.6** (9.63-13.1)	**15.7** (12.6-23.1)	614
	01-02	**4.05** (3.57-4.61)	**4.16** (3.75-4.86)	**7.76** (6.47-9.50)	**16.4** (13.5-18.9)	**24.5** (19.8-28.7)	674
Non-Hispanic blacks	99-00	**3.11** (2.59-3.73)	**3.13** (2.60-3.61)	**5.84** (4.43-7.32)	**10.2** (9.05-15.6)	**18.4** (11.6-35.2)	603
	01-02	**4.63** (3.86-5.42)	**4.59** (3.97-5.02)	**9.89** (7.66-12.5)	**21.2** (16.0-33.2)	**39.8** (27.1-48.1)	702
Non-Hispanic whites	99-00	**3.09** (2.84-3.36)	**3.08** (2.73-3.47)	**5.87** (5.11-6.67)	**10.6** (9.96-13.5)	**20.0** (13.7-23.9)	912
	01-02	**3.80** (3.33-4.33)	**3.63** (3.11-4.32)	**7.71** (6.63-9.17)	**17.0** (13.8-21.8)	**32.8** (21.5-46.8)	1211

Third Report on Environmental Exposure to Chemicals - CDC 2005

Chlorpyrifos

- Decreased Birth Weight and Length (Pereira et al. EHP 2003)
- Impaired Coordination, Memory, and fine motor skills in population exposed to multiple pesticides in Mexico (Guillete et al. EHP 1998)
- EPA phased out of many uses in 2000

A Metabolite of Chorpyrifos

Table 276. 3,5,6-Trichloro-2-pyridinol

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population aged 6-59 years, National Health and Nutrition Examination Survey, 1999-2002.

	Survey years	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval) 50th	75th	90th	95th	Sample size
Total, age 6 and older	99-00	**1.77** (1.46-2.14)	**1.70** (1.40-2.10)	**3.50** (2.50-5.10)	**7.30** (4.80-10.0)	**9.90** (7.60-14.0)	1994
	01-02	**1.76** (1.52-2.03)	**2.20** (1.86-2.61)	**4.95** (4.55-5.29)	**8.80** (7.74-9.77)	**12.4** (10.4-15.3)	2509
Age group							
6-11 years	99-00	**2.88** (1.99-4.16)	**2.70** (1.60-4.80)	**6.90** (3.40-10.0)	**11.0** (7.70-17.0)	**16.0** (10.0-26.0)	481
	01-02	**2.67** (2.13-3.35)	**3.08** (2.46-4.22)	**6.36** (4.97-7.97)	**10.7** (7.96-15.3)	**14.9** (11.5-24.0)	573
12-19 years	99-00	**2.37** (1.89-2.97)	**2.10** (1.60-2.90)	**4.50** (2.90-6.70)	**8.00** (5.50-14.0)	**12.5** (8.00-24.0)	681
	01-02	**2.71** (2.19-3.35)	**3.57** (2.60-4.30)	**6.57** (5.61-7.59)	**11.2** (8.66-15.1)	**18.0** (13.7-23.7)	823
20-59 years	99-00	**1.53** (1.29-1.82)	**1.50** (1.20-1.70)	**2.80** (2.20-4.10)	**5.90** (3.90-8.90)	**8.60** (6.70-11.0)	832
	01-02	**1.51** (1.32-1.72)	**1.91** (1.44-2.26)	**4.42** (3.90-4.80)	**7.78** (7.00-8.91)	**10.9** (9.52-12.4)	1113
Gender							
Males	99-00	**1.92** (1.60-2.32)	**1.90** (1.50-2.40)	**3.50** (2.70-5.60)	**7.30** (5.01-10.0)	**9.90** (7.40-14.0)	972
	01-02	**2.13** (1.81-2.51)	**2.66** (2.19-3.16)	**5.37** (4.83-6.25)	**9.63** (8.20-11.3)	**14.9** (10.9-18.9)	1183
Females	99-00	**1.63** (1.31-2.02)	**1.50** (1.20-1.80)	**3.30** (2.30-5.30)	**7.20** (4.30-12.0)	**10.0** (7.10-15.0)	1022
	01-02	**1.45** (1.24-1.70)	**1.72** (1.39-2.21)	**4.38** (3.72-4.95)	**7.71** (6.30-9.20)	**10.4** (8.47-13.2)	1326
Race/ethnicity							
Mexican Americans	99-00	**1.61** (1.31-2.00)	**1.67** (1.30-2.20)	**3.20** (2.60-3.80)	**5.00** (3.80-7.30)	**7.40** (5.10-17.0)	697
	01-02	**2.02** (1.79-2.28)	**2.63** (2.24-3.01)	**4.55** (4.05-5.39)	**9.02** (7.04-10.8)	**12.2** (10.8-15.7)	660
Non-Hispanic blacks	99-00	**2.17** (1.59-2.97)	**1.90** (1.40-2.70)	**4.20** (2.50-8.30)	**9.40** (6.30-12.9)	**13.0** (9.40-26.0)	521
	01-02	**2.19** (1.68-2.84)	**2.89** (2.28-3.47)	**5.47** (4.77-6.96)	**9.27** (7.47-11.6)	**12.3** (10.1-16.8)	701
Non-Hispanic whites	99-00	**1.76** (1.51-2.05)	**1.60** (1.50-2.00)	**3.40** (2.50-4.80)	**7.10** (4.30-10.5)	**10.0** (7.20-14.0)	602
	01-02	**1.71** (1.43-2.03)	**2.15** (1.62-2.64)	**4.94** (4.41-5.31)	**8.68** (7.47-9.97)	**12.3** (9.77-15.9)	947

Third Report on Environmental Exposure to Chemicals - CDC 2005

Incorporating a Screening Pediatric Environmental Health History Into Routine Well Child Care and Ill Child Care

Addressing the Unique Vulnerabilities of Childhood

Why Take an Environmental History?

- **Clinicians can help identify and/or prevent hazardous exposures**
  - Asking smokers about their smoking and advising them to quit has a positive quit-smoking effect on a population basis
  - Educating parents about sun protection increases their use of sunscreen for their children
  - Although there is little direct evidence of the effect of health provider education for other toxic environmental exposures it is reasonable to be optimistic that this positive effect will generalize.

When To Take An Environmental History

- **Health supervision (“well child”) visits**
  - **Use screening environmental history**
- **Visits for illness**
  - **Unusual presentations**
  - **Persistent or puzzling/non-specific symptoms**
  - **Multiple persons with same symptoms**

Well Child Visits

- **History, PE, monitoring growth and development, giving immunizations, performing screening tests**
- **Anticipatory guidance**
- **25-40% of US pediatricians' time spent in well child care***

* 2000 Nelson's Textbook of Pediatrics

Integrating Questions About Environment Into The History

- Many areas of questioning are already part of the history
- Using Screening History Form can ensure completeness
- Supplemental Form provides additional information
- PEH Primer gives background information

Pediatric Environmental History (0-18 Years of Age)

The Screening Environmental History

For all of the questions below, most are often asked about the child's primary residence. Although some questions may specify certain locations, one should always consider all places where the child spends time, such as daycare centers, schools, and relative's houses.

Where does your child live and spend most of his/her time?	_____
What are the age, condition, and location of your home?	_____
Does anyone in the family smoke?	❑ Yes ❑ No ❑ Not sure
Do you have a carbon monoxide detector?	❑ Yes ❑ No ❑ Not sure
Do you have any indoor furry pets?	❑ Yes ❑ No ❑ Not sure
What type of heating/air system does your home have? ❑ Radiator ❑ Forced air ❑ Gas stove ❑ Wood stove ❑ Other_____	
What is the source of your drinking water? ❑ Well water ❑ City water ❑ Bottled water	
Is your child protected from excessive sun exposure?	❑ Yes ❑ No ❑ Not sure
Is your child exposed to any toxic chemicals of which you are aware?	❑ Yes ❑ No ❑ Not sure
What are the occupations of all adults in the household?	_____
Have you tested your home for radon?	❑ Yes ❑ No ❑ Not sure
Does your child watch TV, or use a computer or video game system more than two hours a day?	❑ Yes ❑ No ❑ Not sure
How many times a week does your child have unstructured, free play outside for at least 30 minutes?	_____
Do you have any other questions or concerns about your child's home environment or symptoms that may be a result of his or her environment?	_____

Follow up/ Notes

This screening environmental history is designed to capture most of the common environmental exposures to children. The screening history can be administered regularly during well-child exams as well as to assess whether an environmental exposure plays a role in a child's symptoms. If a positive response is given to one or more of the screening questions, the primary care provider can consider asking further questions on the topic provided in the Additional Categories and Questions to Supplement the Screening Environmental History.

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- Balk SJ. The environmental history: asking the right questions. *Contemp Pediatr.* 1996;13:19-36.
- Frank A, Balk S, Carter W, et al. Case Studies in Environmental Medicine. Agency for Toxic Substances and Disease Registry, Atlanta GA. 1992, rev. 2000. Taking an Exposure History.

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Screening History

- Where child lives or spends time
- Exposure to secondhand smoke (SHS)
- Water source; food exposures
- Sun exposure
- Exposure related to parents' occupations
- Other concerns elicited from parent

Addressing Unique Vulnerabilities in the History

- Children have unique behaviors, diets, and are closer to the ground - Therefore must consider:
  - Where child lives or spends time
  - Sun Exposure
    - Day Care and School are the child's occupational setting
    - Hand to mouth behavior - Lead dust ingestion
    - Play spaces are potentially hazardous - e.g. Basements
    - Children get ~25% of lifetime sun exposure occurs during childhood and adolescence[1]

1- Godar et al. *Photochem Photobiol 2003*

Addressing Unique Vulnerabilities in the History

- Children consume more food, drink more water, and breath faster than adults - Therefore must consider:
  - Water source
  - Food Sources
  - SHS
  - Type of Heating/Cooling System
  - CO detectors

Addressing Unique Vulnerabilities in the History

- Children have immature metabolic pathways - Therefore must consider:
  - Exposure to water contaminants like Nitrites - methemoglobinemia
  - Synthetic Chemicals - may have different kinetics than adults with potentially different and greater health impacts

Addressing Unique Vulnerabilities in the History

- Young children have unique windows of vulnerability and a long ‘Shelf Life’ - Therefore must consider:
  - Potential neurodevelopmental impact of chronic low level exposures like lead and pesticides
  - Potential cancer risks (long latency) from UV Light exposure and Radon

NEEF Tools to Guide the Pediatric Environmental History

- Primer
- Screening Form
- Additional History
- Environmental History for Asthma

http://www.neefusa.org/health/PEHI/

Pediatric Environmental History (0-18 Years of Age)

The Screening Environmental History

For all of the questions below, most are often asked about the child's primary residence. Although some questions may specify certain locations, one should always consider all places where the child spends time, such as daycare centers, schools, and relative's houses.

Where does your child live and spend most of his/her time?	_____
What are the age, condition, and location of your home?	_____
Does anyone in the family smoke?	❑ Yes ❑ No ❑ Not sure
Do you have a carbon monoxide detector?	❑ Yes ❑ No ❑ Not sure
Do you have any indoor furry pets?	❑ Yes ❑ No ❑ Not sure
What type of heating/air system does your home have? ❑ Radiator ❑ Forced air ❑ Gas stove ❑ Wood stove ❑ Other_____	
What is the source of your drinking water? ❑ Well water ❑ City water ❑ Bottled water	
Is your child protected from excessive sun exposure?	❑ Yes ❑ No ❑ Not sure
Is your child exposed to any toxic chemicals of which you are aware?	❑ Yes ❑ No ❑ Not sure
What are the occupations of all adults in the household?	_____
Have you tested your home for radon?	❑ Yes ❑ No ❑ Not sure
Does your child watch TV, or use a computer or video game system more than two hours a day?	❑ Yes ❑ No ❑ Not sure
How many times a week does your child have unstructured, free play outside for at least 30 minutes?	_____
Do you have any other questions or concerns about your child's home environment or symptoms that may be a result of his or her environment?	_____

Follow up/ Notes

This screening environmental history is designed to capture most of the common environmental exposures to children. The screening history can be administered regularly during well-child exams as well as to assess whether an environmental exposure plays a role in a child's symptoms. If a positive response is given to one or more of the screening questions, the primary care provider can consider asking further questions on the topic provided in the Additional Categories and Questions to Supplement the Screening Environmental History.

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Pediatric Environmental History (0-18 Years of Age)

Additional Categories and Questions to Supplement The Screening Environmental History

For all of the questions below, most are often asked about the child's primary residence. Although some questions may specify certain locations, one should always consider all places where the child spends time, such as daycare centers, schools, and relative's houses.

General Housing Characteristics (For lead poisoning, refer to Table 3.2 in Managing Elevated Blood Lead Levels Among Young Children)	
Do you own or rent your home?	_____
What year was your home built? (Or: Was your home built before 1978? 1950?)	_____
Has your child been tested for lead?	❑ Yes ❑ No ❑ Not sure
Is there a family member or playmate with an elevated blood lead level?	❑ Yes ❑ No ❑ Not sure
Does your child spend significant time at another location? (e.g. baby sitters, school, daycare?)	_____

Indoor home environment (For asthma, refer to Environmental History Form for Pediatric Asthma Patient)	
If a family member smokes, does this person want to quit smoking?	❑ Yes ❑ No ❑ Not sure
Is your child exposed to smoke at the baby sitters, school, or daycare center?	❑ Yes ❑ No ❑ Not sure
Do regular visitors to your home smoke?	❑ Yes ❑ No ❑ Not sure
Have there been renovations or new carpet or furniture in the home during the past year?	❑ Yes ❑ No ❑ Not sure
Does your home have carpet?	❑ Yes ❑ No ❑ Not sure
Is the room where your child sleeps carpeted?	❑ Yes ❑ No ❑ Not sure
Do you use a wood stove or fire place?	❑ Yes ❑ No ❑ Not sure
Have you had water damage, leaks, or a flood in your home?	❑ Yes ❑ No ❑ Not sure
Do you see cockroaches in your home daily or weekly?	❑ Yes ❑ No ❑ Not sure
Do you see rats and/or mice in your home weekly?	❑ Yes ❑ No ❑ Not sure
Do you have smoke detectors in your home?	❑ Yes ❑ No ❑ Not sure

Air Pollution/Outdoor Environment (For asthma, refer to Environmental History Form for Pediatric Asthma Patient)	
Is your home near an industrial site, hazardous waste site, or landfill?	❑ Yes ❑ No ❑ Not sure
Is your home near major highways or other high traffic roads?	❑ Yes ❑ No ❑ Not sure
Are you aware of Air Quality Alerts in your community?	❑ Yes ❑ No ❑ Not sure
Do you change your child's activity when an Air Quality Alert is issued?	❑ Yes ❑ No ❑ Not sure
Do you live on or near a farm where pesticides are used frequently?	❑ Yes ❑ No ❑ Not sure

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Food and Water Contamination

If you use well water for drinking, when was the last time the water was tested?
Coliform bacteria_____ Other microbials_____ Nitrites/nitrates_____ Arsenic_____ Pesticides_____

For all types of water sources:

Have you tested your water for lead?	❑ Yes ❑ No ❑ Not sure
Do you mix infant formula with tap water?	❑ Yes ❑ No ❑ Not sure
Which types of seafood do you normally eat?	_____
How many times per month do you eat that particular fish or shellfish?	_____

How many times a week do you eat any of the following types of fish?
Shark_____ Swordfish_____ Tile fish_____ King mackerel_____ Albacore tuna_____ Other_____

How often do you wash fruits and vegetables before giving them to your child? _____

What type of produce do you buy? ❑ Organic ❑ Local ❑ Grocery store ❑ Other

Toxic Chemical Exposures (Also refer to Taking an Environmental History and Environmental and Occupational History in Recognition and Management of Pesticide Poisonings)

Consider this set of questions for patients with seizures, frequent headaches, or other unusual or chronic symptoms

How often are pesticides applied inside your home?	_____
How often are pesticides applied outside your home?	_____
Where do you store chemicals/pesticides?	_____
Do you often use solvents or other cleaning or disinfectant chemicals?	_____
Do you have a deck or play structure made from pressure treated wood?	❑ Yes ❑ No ❑ Not sure
Have you applied a sealant to the wood in the past year?	❑ Yes ❑ No ❑ Not sure
What do you use to prevent mosquito bites to your children?	_____
How often do you apply that product?	_____

Occupations and Hobbies

What type of work does your child/teenager do?	_____
Do any adults work around toxic chemicals?	❑ Yes ❑ No ❑ Not sure
If so, do they shower and change clothes before returning home from work?	❑ Yes ❑ No ❑ Not sure
Does the child or any family member have arts, crafts, ceramics, stained glass work or similar hobbies?	❑ Yes ❑ No ❑ Not sure

Health Related Questions

Have you ever relocated due to concerns about an environmental exposure?	❑ Yes ❑ No ❑ Not sure
Do symptoms seem to occur at the same time of day?	❑ Yes ❑ No ❑ Not sure
Do symptoms seem to occur after being at the same place every day?	❑ Yes ❑ No ❑ Not sure
Do symptoms seem to occur during a certain season?	❑ Yes ❑ No ❑ Not sure
Are family members/neighbors/co-workers experiencing similar symptoms?	❑ Yes ❑ No ❑ Not sure
Are there environmental concerns in your neighborhood, child's school, or day care?	❑ Yes ❑ No ❑ Not sure

Has any family member had a diagnosis of any of the following?
❑ Asthma ❑ Autism ❑ Cancer ❑ Learning disability

Does your child suffer from any of the following recurrent symptoms?
❑ Cough ❑ Headaches ❑ Fatigue ❑ Unexplained pain_____

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Environmental History Form for Pediatric Asthma Patient

Specify that questions related to the child's home also apply to other indoor environments where the child spends time, including school, daycare, car, school bus, work, and recreational facilities.

		Follow up/ Notes
Is your child's asthma worse at night?	❑ Yes ❑ No ❑ Not sure	
Is your child's asthma worse at specific locations? If so, where? _____	❑ Yes ❑ No ❑ Not sure	
Is your child's asthma worse during a particular season? If so, which one? _____	❑ Yes ❑ No ❑ Not sure	
Is your child's asthma worse with a particular change in climate? If so, which? _____	❑ Yes ❑ No ❑ Not sure	
Can you identify any specific trigger(s) that makes your child's asthma worse? If so, what? _____	❑ Yes ❑ No ❑ Not sure	
Have you noticed whether dust exposure makes your child's asthma worse?	❑ Yes ❑ No ❑ Not sure	
Does your child sleep with stuffed animals?	❑ Yes ❑ No ❑ Not sure	
Is there wall-to-wall carpet in your child's bedroom?	❑ Yes ❑ No ❑ Not sure	
Have you used any means for dust mite control? If so, which ones? _____	❑ Yes ❑ No ❑ Not sure	
Do you have any furry pets?	❑ Yes ❑ No ❑ Not sure	
Do you see evidence of rats or mice in your home weekly?	❑ Yes ❑ No ❑ Not sure	
Do you see cockroaches in your home daily?	❑ Yes ❑ No ❑ Not sure	
Do any family members, caregivers or friends smoke?	❑ Yes ❑ No ❑ Not sure	
Does this person(s) have an interest or desire to quit?	❑ Yes ❑ No ❑ Not sure	
Does your child/teenager smoke?	❑ Yes ❑ No ❑ Not sure	
Do you see or smell mold/mildew in your home?	❑ Yes ❑ No ❑ Not sure	
Is there evidence of water damage in your home?	❑ Yes ❑ No ❑ Not sure	
Do you use a humidifier or swamp cooler?	❑ Yes ❑ No ❑ Not sure	
Have you had new carpets, paint, floor refinishing, or other changes at your house in the past year?	❑ Yes ❑ No ❑ Not sure	
Does your child or another family member have a hobby that uses materials that are toxic or give off fumes?	❑ Yes ❑ No ❑ Not sure	
Has outdoor air pollution ever made your child's asthma worse?	❑ Yes ❑ No ❑ Not sure	
Does your child limit outdoor activities during a Code Orange or Code Red air quality alert for ozone or particle pollution?	❑ Yes ❑ No ❑ Not sure	
Do you use a wood burning fireplace or stove?	❑ Yes ❑ No ❑ Not sure	
Do you use unvented appliances such as a gas stove for heating your home?	❑ Yes ❑ No ❑ Not sure	
Does your child have contact with other irritants (e.g., perfumes, cleaning agents, or sprays)?	❑ Yes ❑ No ❑ Not sure	

What other concerns do you have regarding your child's asthma that have not yet been discussed?

_____

_____

NEEF Pediatric Asthma Initiative

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