An Overview of Healthy Homes
Impacts on Vulnerable Populations

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Neasha Graves, MPA
UNC Institute For The Environment

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An Overview of Healthy Homes

Lead poisoning

Moisture and mold

Indoor air quality

Pests and pesticides

Maintenance & monitoring
Sources of Lead Poisoning
Common Asthma Triggers

- Tobacco smoke
- Dust mites
- Mold
- Pet dander
- Cockroach
- Personal care products
- Air pollution
- Pollen
Someone can live in either of these homes and have health risks related to that structure.

*But the reality is...*
Substandard Housing in the United States

<table>
<thead>
<tr>
<th>Race</th>
<th>Percentage</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>2.8%</td>
<td>9.32 million</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.3%</td>
<td>3.24 million</td>
</tr>
<tr>
<td>Black</td>
<td>7.5%</td>
<td>3.6 million</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>16 million</td>
</tr>
</tbody>
</table>

Source: 2005 American Housing Survey
People Living in Poverty, 2012

Source: http://convergence.unc.edu/vulnerabilities/housing/, Retrieved 6/5/2017
Housing Units that are Mobile Homes, 2015

Source: http://convergence.unc.edu/vulnerabilities/housing/, Retrieved 6/5/2017
Percent of North Carolina Children with Blood Lead Levels (BLLs) ≥ 5µg/dL, 2010-2014
The Cost of Addressing Healthy Homes
## Costs of Medical Care Related to Childhood Lead Poisoning

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Treatment</td>
<td>$11-53 billion</td>
</tr>
<tr>
<td>Lost Earnings</td>
<td>$165-233 billion</td>
</tr>
<tr>
<td>Lost Tax Revenue</td>
<td>$25-35 billion</td>
</tr>
<tr>
<td>Special Education</td>
<td>$30-146 million</td>
</tr>
<tr>
<td>Lead-Linked ADHD Cases</td>
<td>$267 million</td>
</tr>
<tr>
<td>Lead-Linked Criminal Activity</td>
<td>$1.7 billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$192-270 billion</strong></td>
</tr>
</tbody>
</table>

Cost of Asthma in the US

Direct costs: $49.9B
- ED visits
- Hospitalizations
- Medications (all)
- Outpatient visits
- Additional labs/tests
- Other costs

Indirect costs: $32B
- Work-related costs
- Disability
- Asthma-related death

= $81.9 billion

Average annual cost of care for person with asthma:
$3,266

Source: American Thoracic Society, January 2018
What is the cost of asthma care?

Average annual cost of care for person with asthma: $3,266

Preventive environmental measures can reduce annual costs by $1,960
Other Influences Impacting Lead and Asthma Care
When should children be tested for lead poisoning?
Less Testing among Those at Greater Risk
Policy: NC Lead Investigation Expansion Plan

Since January 1, 2018…

- Blood lead action level dropped from 10µg/dL to 5µg/dL for children <6 years old
- Investigation **offered** for a child whose BLL is 5-9µg/dL
- Investigation **required** for a child whose BLL is >10µg/dL
- Same for pregnant women with similar EBLs
- 2 consecutive blood lead tests w/in 12 months required at new action levels

Policies aimed at vulnerable children

Medicaid recipients  
Refugee children
Birth countries of lead poisoned children and pregnant women

Birth countries of at least 2 children identified with lead poisoning in NYC (2013 - 2015)

Birth countries of at least 2 pregnant women identified with lead poisoning in NYC (2013 - 2015)

Both
A woman may have lead in her body due to ingestion or inhalation over her lifetime.

**Risk factors**

- Recent immigrant to the US
- Pica
- Cultural items
- Occupational exposure
- Contaminants in the home
- Nutritional status
- Cumulative lifetime exposures
What are some factors that influence poor asthma outcomes?

- Race and ethnicity
- Income
- Education
- Poor medication use
Influences on Asthma Care and Outcomes

- Asthma Education
- Environment

Poor Asthma Outcomes
Improved Asthma Outcomes

Improved Asthma Outcomes
Tools and Resources for Informing Vulnerable Populations
Engaging with patients can improve asthma outcomes

Basic asthma facts
Patient skills
Roles of medications

Self-management should be taught and reinforced throughout the patient’s continuum of care.
Strategies for Addressing Asthma in Homes

Core Elements of a Home Visit

**Asthma Education**
- What Is Asthma?
- Medications and Devices
- Asthma Action Plans

**Home Exposure Assessment**

**Asthma Triggers**
- Pets
- Dust
- Chemicals
- Mold
- Pests

Partnering and Resources

**Communication with Healthcare Providers, Schools, etc.**
**Links to Services**

Additional Elements

**Home Cleaning**
**Hand-Washing**
**Allergen Avoidance Supplies**
**Asthma Symptom Diary**

Home Characteristics and Asthma Triggers

**Checklist for Home Visitors**

Using this Home Assessment Can Help Make Homes Healthier.
A trained home visitor can help find common asthma triggers in homes and discuss ways to reduce and remove triggers. Removing asthma triggers in the home, along with proper medical care, can improve health.

The checklist is organized into a Core Assessment plus two appendices (Dust Mite Module and Mold and Moisture Module). The Core Assessment can be used for all types of housing and climates, but the additional modules can be used if dust mites or mold/moisture issues are suspected by the trained home visitor. The suggested action items in this checklist are generally simple and low cost.

Glossary of Asthma Triggers Commonly Found in Homes

**Combustion by-products**
Triggers: Fumes and gases that are formed when fuel is burned.
Where Found: Gas cooking appliances, fireplaces, wood stoves, candles, incense, cigarette, and unvented kerosene and gas space heaters.

**Dust Mites**
Triggers: Dust mites feed on dead skin cells and are commonly found in areas with more moisture, such as kitchens, bedrooms, and basements or areas where water damage has occurred.
Where Found: Mattresses, bedding, carpets, curtains, upholstered furniture, and stuffed toys. Dust mites are too small to be seen with the naked eye but they prefer high humidity.

**Mold**
Triggers: Mold spores, fragments, and spores.
Where Found: Indoor mold growth is often found in areas with more moisture such as kitchens, bathrooms, and basements or areas where water damage has occurred. There are many types of mold and they can be found in any climate.

**Pests**
Triggers: Cockroaches—Body parts and droppings.
Where Found: Areas with food and water such as kitchens, bathrooms, and laundry.

**Pets with fur**
Triggers: Fur, skin flakes, and saliva.
Where Found: Throughout entire home.

**Secondhand Smoke**
Triggers: Harmful smoke from the burning end of a cigarette, pipe, or cigar and the smoke exhaled by a smoker.
Where Found: Anywhere that smoking is allowed.

**Volatile organic compounds (VOCs)**
Triggers: Chemical vapors that come from household items.
Where Found: Products such as cleaning agents, deodorizers, air fresheners, perfumes, paints, and polish, and nail polish remover.
Asthma action plans can help people manage their asthma

Asthma Triggers

Try to stay away from or control these things:
- Exercise
- Mold
- Chalk dust/dust
- Pollen
- Animals
- Tobacco Smoke
- Food
- Smoke, strong odors or spray
- Colds/Respiratory infections
- Carpet
- Change in temperature
- Dust mites
- Cockroaches
- Other

Nearly 44% of NC children with asthma have never been given an asthma action plan.
Hands on Learning
Teaching asthma as a chronic lung disease
Online Resources

http://nchealthyhomes.com
The UNC-CEHS Community Engagement Core (CEC) enhances the environmental health literacy of public health professionals, community health workers and vulnerable populations, by increasing their understanding of the Center’s environmental health sciences research and empowering them to make informed decisions to reduce harmful environmental exposures in homes and communities. The CEC also fosters dialogue between UNC-CEHS researchers and community partners about Center research to inform responsive research approaches and strategies for communicating CEHS science to community audiences.
Local Healthy Homes Resources

Pitt County Resources

Listed below are agencies and organizations that may be able to assist with housing, environmental hazards and other needs.

Addressing Home Hazards

Disaster Recovery
Disaster Recovery Partner for Pitt County
Rev. Rodney Coles: 252-717-9600 or rodneycon2007@gmail.com

Pest Management
NC Cooperative Extension: 252-902-1700

Smoking Prevention
Allyson Smith at the Tobacco Prevention and Control Branch: 252-902-2438

Housing Assistance
Aydin Housing Authority: 252-746-2021
Catholic Charities: 252-355-5111
Community Crossroads Center: 252-752-0829
Farmsville Housing Authority: 252-753-5347
Farmsville Housing Department: 252-753-6720
Greenville Housing Authority: 252-329-4000

Maternal, Infant, and Child Health
Martin-Pitt Partnership for Children Inc: 252-758-8885
Pregnancy Care Management: 252-902-2319
WIC Clinic: 252-902-2393
Lead Sources Library

- Educational tool for public health professionals and families
- Visual aid for public health professionals during and after a lead investigation
Addressing EH Issues after Natural Disasters

NC Disaster Response and Recovery

In recent years, hurricanes and tropical storms have devastated parts of North Carolina. The UNC Center for Environmental Health and Sustainability has compiled a list of environmental health resources as part of the UNC community’s effort to provide relief and recovery to impacted communities.

Environmental Health Resources

- Moisture and Mold Cleanup
- Safe Drinking Water and Food
- Mosquito and Insect Control
- Air Quality Hazards
- Child Care Needs
- Additional Env Health Resources
Other Disaster Clean-Up Resources

Get Rid of Mold

After a flood, mold will grow in your house. It can make you sick. You will need to clean your house.

- Take things that were wet for 2 or more days outside.
- Things that stayed wet for 2 days have mold growing on them even if you can't see it.
- Take out stuff made of cloth, unless you can wash them in hot water. Also take out stuff that can't be cleaned easily (like leather, paper, wood, and carpet).
- Use bleach to clean mold off hard things (like floors, stoves, sinks, certain toys, countertops, flatware, plates, and tools).
- Follow these steps:
  - Never mix bleach with ammonia or other cleaners.
  - Wear rubber boots, rubber gloves, goggles, and N-95 mask.
  - Open windows and doors to get fresh air when you use bleach.
  - Mix no more than 1 cup of bleach in 1 gallon of water.
  - Wash the item with bleach and water mixture.
  - If the surface of the item is rough, scrub the surface with a stiff brush.
  - Rinse the item with clean water.
  - Dry the item or leave it out to dry.

How Literacy Impacts Vulnerable Populations

>36 million
US adults can’t read above 3rd grade level

43% of adults
with lowest literacy levels live in poverty

$232 billion
each year in health care costs related to low adult literacy levels

72%
chance of a child to have low literacy if they’re parents are illiterate

1 in 6
adults drop out of high school every year

50% (2 million)
immigrants come to the US each year without HS diploma or proficient English skills

Source: ProLiteracy, 2016
Low Literacy Educational Materials

**Image 1:**
- **Title:** Are You Pregnant?
- **Message:** Take action to protect your baby from lead poisoning.
- **Instructions:**
  - Get A Blood Test
  - Wash Hands
  - Eat Healthy Food
  - Drink Safe Water

**Image 2:**
- **Title:** Lead Poisoning Can Be Prevented
- **Message:** Some Do's & Don'ts
- **Instructions:**
  - Wash Hands and Toenails
  - Eat Healthy Food
  - Test Kids for Lead

**Image 3:**
- **Title:** Keeping Lead at Work and Preventing Take-Home Lead Exposure
- **Message:**
  - Be careful what you bring to work.
  - Consider bringing food, water, or clothing in disposable containers or bags.

**Image 4:**
- **Title:** Lead in Spices and Other Cultural Items
- **Message:**
  - Some spices, herbal remedies, and cosmetics may contain lead, especially those imported from India, Asia, Africa, and the Middle East.

**Image 5:**
- **Title:** Prevent Lead Poisoning
- **Message:**
  - Keep your home lead-free by removing sources of lead from your environment.

**Image 6:**
- **Title:** Keeping Lead at Work and Preventing Take-Home Lead Exposure
- **Message:**
  - Be careful what you bring to work.
  - Protect your personal belongings from lead exposure.
  - Do NOT eat in work areas.
  - Use disposable water sources or what is provided at work.
  - Always wash hands and face with soap and water before eating, drinking, or smoking.
<table>
<thead>
<tr>
<th>Tenant Responsibility</th>
<th>Landlord Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Keep it clean</strong></td>
<td>Help tenants safely get rid of pests</td>
</tr>
<tr>
<td>Clean up spills</td>
<td>Make sure ventilation fans work</td>
</tr>
<tr>
<td>Store food in sealed containers</td>
<td>Fix indoor leaks</td>
</tr>
<tr>
<td>Sweep/vacuum regularly</td>
<td>Fix moisture intrusion</td>
</tr>
<tr>
<td>Use trash cans with lids</td>
<td>Clean gutters in spring and fall</td>
</tr>
<tr>
<td><strong>Keep it dry</strong></td>
<td>Fix structural issues</td>
</tr>
<tr>
<td>Monitor indoor humidity</td>
<td>Protect tenants from lead and asbestos hazards</td>
</tr>
<tr>
<td>Open windows or use fans after showering and cooking</td>
<td></td>
</tr>
<tr>
<td>Alert landlord to moisture, leaks, pests, holes</td>
<td></td>
</tr>
<tr>
<td><strong>Fix it</strong></td>
<td></td>
</tr>
<tr>
<td>Alert landlord to moisture, leaks, pests, holes</td>
<td>Install one working CO alarm per unit, per level</td>
</tr>
<tr>
<td><strong>Monitor it</strong></td>
<td>Install working smoke alarm</td>
</tr>
<tr>
<td>Replace batteries in alarms as needed during tenancy (unless alarm is 10 year lithium battery tamper resistant)</td>
<td>- Replace alarms within 15 days if not working</td>
</tr>
<tr>
<td>Replace furnace filter every 3 months</td>
<td>- Make sure alarms are operable at move in</td>
</tr>
</tbody>
</table>
Contacts

Neasha Graves
neasha_graves@unc.edu
(919) 966-3746

Megan Hoert Hughes
meganhughes@unc.edu
(919) 966-2463

Megan Rodgers
merodgers@unc.edu
(919) 966-7238

Contact for Lead/HH Task Force & listserv