The Impact of Housing Quality on Children’s Health

Nan Feyler, JD, MPH
Deputy Commissioner
Philadelphia Department of Public Health

October 28, 2014
Goals for Children’s Housing

• Keep families in their homes
  • Reduce the risk of homelessness

• Housing Costs Affordable
  • Reduce share of income needed for housing

• Increase housing stability
  • Reduce stress and harm from frequent moves

• Improve Housing Quality
  • Reduce health and safety hazards; increase housing security
Impact of Poor Housing Quality and Children’s Health

- Development and worsening asthma has been tied to specific housing conditions
  - Pests (cockroaches and mice)
  - Molds/Chronic Dampness
  - Tobacco smoke

- Lead exposure tied to long term health effects

- Emotional and behavioral problems linked to parental stress, mental health problems and their limited ability to regulate family activities in poor quality housing.

Coley, Leventhal, Lynch and Kull, Dev Psych 2013
Poor Housing Quality is a Serious Threat to Children’s Health

- Of five housing characteristics studied
  - Quality
  - Stability
  - Affordability
  - Ownership
  - Receiving A Housing Subsidy

**Poor housing quality** is the most consistent and strongest predictor of emotional and behavioral problems in low-income children and youth among the 5 factors studied.

**Housing Instability** is a close second.

Coley, Leventhal, Lynch and Kull, Dev Psych 2013
Housing Characteristics

2008-2012 American Community Survey
Housing characteristics related to indoor air quality & asthma triggers, 2009

- Below Poverty Level
- African American
- All Philadelphia
- U.S.

- Percent

- Hole in Roof
- Leak/s inside home
- Rodents in home in past 3 months
- Uncomfortably cold for 24 hrs or more

American Community Survey, 2009
Housing characteristics related to safety (2009)

Percentage of Housing Units

- Broken windows
- Rooms w/out electric outlets
- Lacking a working smoke detector
- Use of portable electric heaters
- Moderate or severe physical problems with home

Legend:
- Philadelphia Low Income
- Philadelphia African American
- All Philadelphia
- US

American Community Survey, 2009
## Conditions of Housing Philadelphia & US

<table>
<thead>
<tr>
<th>Condition</th>
<th>% Philadelphia</th>
<th>% National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodents in home in past 3 months</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Leak(s) inside home</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Open cracks or holes inside homes</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Moderate or severe physical problems with home</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Lacking a working smoke detector</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Hole in Roof</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Broken plaster or peeling paint inside home</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Broken windows</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Holes in floors</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Rooms without electric outlets</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Overall rating of structure is poor</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Foundation crumbling, cracks or holes</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

American Housing Survey (2009)
Poverty and Median Income in Philadelphia

NEARLY 1 OUT OF EVERY 2.5 CHILDREN LIVES BELOW THE FEDERAL POVERTY LINE.

Poverty by Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>430,000+</td>
</tr>
<tr>
<td>Children under 18</td>
<td>135,000</td>
</tr>
<tr>
<td>Adults 18-64</td>
<td>265,000</td>
</tr>
<tr>
<td>Seniors 65+</td>
<td>32,000</td>
</tr>
</tbody>
</table>

Median Household Income: 25 Largest Cities

<table>
<thead>
<tr>
<th>City</th>
<th>Median Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Jose</td>
<td></td>
</tr>
<tr>
<td>District of Columbia</td>
<td></td>
</tr>
<tr>
<td>San Francisco</td>
<td></td>
</tr>
<tr>
<td>Seattle</td>
<td></td>
</tr>
<tr>
<td>San Diego</td>
<td></td>
</tr>
<tr>
<td>Charlotte</td>
<td></td>
</tr>
<tr>
<td>New York City</td>
<td></td>
</tr>
<tr>
<td>Austin</td>
<td></td>
</tr>
<tr>
<td>Boston</td>
<td></td>
</tr>
<tr>
<td>Fort Worth</td>
<td></td>
</tr>
<tr>
<td>Denver</td>
<td></td>
</tr>
<tr>
<td>Los Angeles</td>
<td></td>
</tr>
<tr>
<td>Jacksonville</td>
<td></td>
</tr>
<tr>
<td>Phoenix</td>
<td></td>
</tr>
<tr>
<td>Chicago</td>
<td></td>
</tr>
<tr>
<td>Houston</td>
<td></td>
</tr>
<tr>
<td>San Antonio</td>
<td></td>
</tr>
<tr>
<td>El Paso</td>
<td></td>
</tr>
<tr>
<td>Dallas</td>
<td></td>
</tr>
<tr>
<td>Columbus</td>
<td></td>
</tr>
<tr>
<td>Indianapolis</td>
<td></td>
</tr>
<tr>
<td>Baltimore</td>
<td></td>
</tr>
<tr>
<td>Memphis</td>
<td></td>
</tr>
<tr>
<td>Philadelphia</td>
<td></td>
</tr>
<tr>
<td>Detroit</td>
<td></td>
</tr>
</tbody>
</table>

National Average: $50,502

Shared Prosperity Plan, Philadelphia 2013
### What Does the Poverty Rate Mean?

#### 2014 POVERTY GUIDELINES FOR THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA

<table>
<thead>
<tr>
<th>Persons in family/household</th>
<th>Poverty guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$11,670</td>
</tr>
<tr>
<td>2</td>
<td>15,730</td>
</tr>
<tr>
<td>3</td>
<td>19,790</td>
</tr>
<tr>
<td>4</td>
<td><strong>23,850</strong></td>
</tr>
<tr>
<td>5</td>
<td>27,910</td>
</tr>
<tr>
<td>6</td>
<td>31,970</td>
</tr>
<tr>
<td>7</td>
<td>36,030</td>
</tr>
<tr>
<td>8</td>
<td>40,090</td>
</tr>
</tbody>
</table>
In 24 of the city’s 46 residential zip codes, the poverty rate is over 20%. Concentrations are greatest in North and West Philadelphia.
Philadelphia Poverty Rate 1980 and 2010

PERCENT OF POPULATION LIVING BELOW POVERTY
[RATIO TO POVERTY LEVEL]

% below poverty level
<10%  11-15%  16%-24%  24%-40%  >40%

Data Sources:
1980 Ratio to Poverty, 1980 Decennial Census, SF3 P88 from National Historical Geographic Information System.
2010 Ratio to Poverty, American Community Survey, 2006-2010 5yr Estimate, C17002.
Children Living in Poverty
Philadelphia (2000-2011)

Children living in poverty, <18 years

Source: US Census / American Communities Survey
THE COST OF HOUSING IN PHILADELPHIA
Housing Cost Burden Philadelphia (2010)

Renters

- >50%: 31%
- 30-50%: 22%
- <30%: 47%

Homeowners

- >50%: 15%
- 30-50%: 18%
- <30%: 67%

Percent of Income Paid for Housing

Year 4 Consolidated Plan, 2015 Action Plan, City of Philadelphia Office of Community Housing Development
56% of Philadelphia’s Families are Housing Insecure

- Homeless, 1%
- Frequent Moves, 5%
- Behind in Rent, 26%
- Crowded, 25%
- Stable Housing, 43%
The Cycle of Housing Insecurity

Poor Housing Quality

Frequent Moves

Crowded

Unsafe Neighborhood

Prevent meeting other basic needs (food, health care)
HOUSING QUALITY AND HEALTH: LEAD POISONING
Lead Poisoning of Children

• Entirely Preventable
• Irreversible and Long Term Harm
  • Lowered IQ
  • Behavior problems
  • Learning disabilities
  • Cardiovascular, immune and endocrine Problems
• Prevention requires home remediation: education and cleaning does not prevent lead poisoning.
• There is no safe level of lead exposure.
The PDPH Lead and Healthy Housing Program: Lead Hazard Control

- Provides children with EBLL (1 venous test $\geq 10$)
  - Coordination with PCP
  - Integrated with Healthy Homes Healthy Kids Program
  - Educational Home Visits
  - “Superclean” where needed
  - Environmental Inspection
  - Relocation support where needed
  - Remediation funding for low income families
  - Dust wipe clearance
Lead Screening and Lead Poisoning of Children, Philadelphia

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>No. of Children Tested</th>
<th>% of Census Pop Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>89,500</td>
<td>74.8</td>
</tr>
<tr>
<td>2011</td>
<td>94,868</td>
<td>79.3</td>
</tr>
<tr>
<td>2012</td>
<td>98,889</td>
<td>82.7</td>
</tr>
</tbody>
</table>

*Testing and child age as of Dec. 31st for year shown. Includes tests performed in previous years (PA NEDSS 4/11/14)

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Children</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>981</td>
<td>6.2</td>
</tr>
<tr>
<td>2011</td>
<td>648</td>
<td>3.9</td>
</tr>
<tr>
<td>2012</td>
<td>601</td>
<td>2.9</td>
</tr>
<tr>
<td>2013</td>
<td>552</td>
<td>2.9</td>
</tr>
</tbody>
</table>

PA NEDSS
Decreasing Lead Poisoning Rates in Philadelphia (≥ 10 µg/dL)

Elevated lead levels per 1,000 children, 0-5 years

Comparison of EBLLs Versus CDC Reference Value

Blood lead level of 10 micrograms per deciliter, or higher. Children only counted once if they have elevated lead levels in multiple years.
Percent of Children Under 3 Years Old
with an Elevated Blood Lead* Level (10+ug/dL)
Among Those Tested

Legend
Percent EBLL
- 0.0
- 0.1 - 3.5
- 3.6 - 5.5
- 5.6 - 9.0
- 9.1 - 18.0

* Regardless of test type
HOUSING QUALITY AND HEALTH: ASTHMA

Asthma hospitalization rate per 100,000 children, <18 years

Source: Pennsylvania Health Care Cost Containment Council
Child asthma hospitalization rate per 100,000, <18 years

Asthma Related ER Visits Children < 18 yrs. Philadelphia, PA

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>10,5550</td>
</tr>
<tr>
<td>2010</td>
<td>9,958</td>
</tr>
</tbody>
</table>

Source: Pennsylvania Health Care Cost Containment Council, 2010
The Healthy Homes Healthy Kids Program
City of Philadelphia Department of Public Health
Healthy Homes Healthy Kids Program

- Collaboration with St. Christopher’s Hospital for children with severe asthma

- **Integrates clinical, environmental and educational strategies** to successfully mitigate and manage a child’s asthma and prevent lead poisoning

- Services are provided in English and Spanish in an appropriate cultural framework.

- Results in fewer asthma attacks with reduced ER and inpatient hospitalizations, increased school attendance and improved wellbeing of child
1. Reduce Environmental Health and Safety Hazards
   - Repair Leaks
   - Remove mold and repair water damage
   - Rip up old carpeting and refinish floors
   - Replace leaded windows where children can reach
   - Vector Control Unit services (Integrated Pest Management)
   - Energy Audit and Weatherization

2. Help Families Engage in Healthier Behavior
   - Personalized Environmental Action Plan & Motivational Interviews
   - Issues include: clutter, tobacco smoke, stop use of perfumes, candles, noxious cleaning and pest control supplies

3. Partner with Clinical Team
   - Biweekly calls for information sharing
   - Ensure child and caregiver understand and use medication as prescribed
Healthy Homes Healthy Kids
% of Properties with Health and Safety Hazards

- Safety Hazards: 100%
- Lead Hazards: 56%
- Pests: 100%
- Carbon Monoxide/Poisonous Gas: 100%
- Mold/Moisture: 81%
- Allergens: 69%

(January 2013 – December 2014) N=160
# Average Cost Per Unit of Healthy Homes Healthy Kids Intervention

<table>
<thead>
<tr>
<th>Activity/Personnel</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remediation</td>
<td>$3000</td>
</tr>
<tr>
<td>Integrated Pest Management</td>
<td>$150</td>
</tr>
<tr>
<td>Staffing</td>
<td>$110</td>
</tr>
<tr>
<td>Client supplies</td>
<td>$200</td>
</tr>
<tr>
<td><strong>Total Cost For HHHK Services per unit</strong></td>
<td><strong>$3500</strong></td>
</tr>
<tr>
<td>Weatherization (selected homes only)</td>
<td><strong>$1200</strong></td>
</tr>
</tbody>
</table>
## Healthy Homes Health Kids Child Health Outcomes*  
(January 2011 through December 2013)

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention (first home visit)</th>
<th>Post-Intervention (3 months after home remediation)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of hospitalizations for asthma in past 6 months</td>
<td>1.7</td>
<td>0.3</td>
<td>70% fewer hospitalizations</td>
</tr>
<tr>
<td>No. of emergency room visits for asthma in past 6 months</td>
<td>3.8</td>
<td>0.9</td>
<td>76% fewer ER visits</td>
</tr>
<tr>
<td>No. of doctor’s visits for asthma in the past 6 months</td>
<td>3.7</td>
<td>1.4</td>
<td>62% fewer doctor’s visits</td>
</tr>
<tr>
<td>No. of missed school days or daycare because of asthma in the past month</td>
<td>4.0</td>
<td>1.9</td>
<td>53% fewer missed days of school or daycare</td>
</tr>
<tr>
<td>Use of Albuterol pump in the past two weeks</td>
<td>8.6</td>
<td>3.9</td>
<td>55% fewer uses of Albuterol Pump</td>
</tr>
</tbody>
</table>

* Numbers are average of 117 children surveyed based on per and post test questionnaires
IMPROVING HOUSING QUALITY: Next Steps
Goal One: Partnerships

with community organizations, health care providers, government agencies, health insurers, housing organizations, and legal services.

*Increase awareness and leadership for safe and healthy housing for low income children.*
Goal Two: Sustainable Funding

for services to reduce the health and safety hazards in homes and support families’ healthy behavioral changes.

Explore reimbursement by Medicaid, Private Insurance, Medicaid Managed Care Organizations, and Hospitals.
Goal Three: Services and Support

to ensure families have the resources, support, access to health care and legal services they need to reduce the health and safety hazards in their homes.

Ensure that services are available to protect against eviction and assist families seeking to live in better housing conditions.
Goal Four: Enhanced Enforcement

Identify resources to enhance enforcement the Health Code, Property Maintenance Code and other laws which can help improve the housing conditions of children.

*Use legal tools to improve the housing conditions where children live.*
Unsafe housing is a danger to the health of millions of people across the United States. Minorities and lower income families have significantly higher odds of living in inadequate housing. And they pay a steep price in their own health.”

*Kathleen Sebelius, Secretary of Health and Human Services*

*National Healthy Homes Conference, Denver, CO*

*June 23, 2011*
Every Child Deserves a Healthy Home

Seven Tips for Keeping a Healthy Home

1. Keep it Dry
   Prevent water from entering your home through leaks in roofing systems, rain water from entering the home due to poor drainage, and check your interior plumbing for any leaking.

2. Keep it Clean
   Control the source of dust and contaminants, creating smooth and cleanable surfaces, reducing clutter, and using effective wet-cleaning methods.

3. Keep it Safe
   Store poisons out of the reach of children and properly label. Secure loose rugs and keep children’s play areas free from hard or sharp surfaces. Install smoke and carbon monoxide detectors and keep fire extinguishers on hand.

4. Keep it Well-Ventilated
   Ventilate bathrooms and kitchens and use whole house ventilation for supplying fresh air to reduce the concentration of contaminants in the home.

5. Keep it Pest-free
   All pests look for food, water and shelter. Seal cracks and openings throughout the home, store food in pest-resistant containers. If needed, use sticky-traps and baits in closed containers, along with least toxic pesticides such as boric acid powder.

6. Keep it Contaminant-free
   Reduce lead-related hazards in pre-1978 homes by fixing deteriorated paint, and keeping floors and window areas clean using a wet-cleaning approach. Test your home for radon, a naturally occurring dangerous gas that enters homes through soil, crawlspaces, and foundation cracks. Install a radon removal system if levels above the EPA action-level are detected.

7. Keep it Well-Maintained
   Inspect, clean and repair your home routinely. Take care of minor repairs and problems before they become large repairs and problems.

www.hud.gov/healthyhomes