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Healthy Homes for Elders: Multi-trigger, Multi-component Environmental Interventions for Asthma

David Turcotte  
*University of Massachusetts Lowell*

*Et al.*

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Healthy Homes for Elders: Multi-trigger, Multi-component Environmental Interventions for Asthma

David Turcotte, ScD
Susan Woskie, PhD
Emily Chaves, MA
Rebecca Gore, PhD
Kelechi Adejumo, MS

Carla Caraballo
Lowell Community Health Center
Ronnie Mouth
Funded by the U.S. Department of Housing and Urban Development

Why asthma? Why Lowell?

– High asthma rate
– Diverse community
– Community health & PHA partners
– Novel intervention research with asthmatic seniors
# Asthma Prevalence Rates in Lowell by Age-Group

<table>
<thead>
<tr>
<th>Age-Group</th>
<th>Prevalence in Lowell</th>
<th>95% CI-Lo</th>
<th>95% CI-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (5-14)*</td>
<td>13.01</td>
<td>12.40</td>
<td>13.63</td>
</tr>
<tr>
<td>Adults (18-64)**</td>
<td>15.9</td>
<td>12</td>
<td>19.9</td>
</tr>
<tr>
<td>Adults (65+)**</td>
<td>13.6</td>
<td>6.6</td>
<td>20.7</td>
</tr>
</tbody>
</table>

*Pediatrics Asthma Surveillance, 2008-2009;  
**Massachusetts Behavioral Risk Factor Surveillance System, 2011

_Prepared 01/13/2014 by Massachusetts Department of Public Health_
Project Goals:

Home assessments (90)
Home interventions (90)
Evaluate home intervention effectiveness
Disseminate findings
Partners & Roles

- University of Massachusetts Lowell
- Lowell Community Health Center
- Lowell Housing Authority
Who are we enrolling?

- Live in Lowell Public or Assisted Housing
- Age 62+
- Current Asthma or
- Asthma Diagnosis & COPD
- Low Income
What is Asthma?

• A serious & sometimes life-threatening respiratory disease
• Affects the quality of life for millions of Americans
• No cure for Asthma yet
• Can be controlled through medical treatment & management of environmental triggers
• Americans spend up to 90% of their time indoors.
• Indoor concentrations of most pollutants are higher than outdoor.
Indoor Environment and Asthma

• Indoor allergens and irritants can play significant roles in triggering asthma attacks
  – Ex: pet dander, mice, cockroaches, dust mites, harsh chemicals, fragrances, smoke, moisture/mold, pollen

• Important to recognize potential asthma triggers & reduce exposure
Home Intervention - Assessment

- Health/environmental assessments
  - Health questionnaires
  - Urinary cotinine
  - eNO (Niox Mino)
  - Environmental walk-through assessment
  - Environmental questionnaire
  - Dust sampling
  - NO2 sampling (gas stoves)

Assessment → Education, Supplies, Remediation → Mid-term Assessment 6th month → Final Assessment 12th month
Education, Supplies, Intervention

Based on findings from assessment:

• **Education**
  – Dust mites and healthy cleaning practices
  – Pets
  – Avoiding pests
  – Moisture/mold control
  – Smoking
  – Air pollution (indoor & outdoor)

• **Supplies**
  – HEPA vacuum
  – Allergen-proof mattress and pillow covers
  – Trash can with lid
  – Food containers
  – Non-toxic cleaner
  – Baits and traps for pests

Assessment ➔ Education, Supplies, Remediation ➔ Mid-term Assessment 6th month ➔ Final Assessment 12th month
Education, Supplies, Remediation Cont.

- Remediation
  - Gas stove replacement
  - Install & repair ventilation
  - Integrated Pest Management (IPM)
  - Industrial cleaning
Mid-term Assessment

- Health questionnaire (abbreviated)
- Environmental questionnaire (abbreviated)
- More supplies if needed
- Reinforce education
Final Assessment

- Health questionnaires
- Urinary cotinine
- eNO (Niox Mino)
- Environmental questionnaire
- Environmental walk-through
- Dust sampling
- NO2 sampling (gas stoves)
- Gift certificate
# Results

## Table 1. Demographics of participants

<table>
<thead>
<tr>
<th></th>
<th>(n=49)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: Male</td>
<td>11</td>
<td>22.5</td>
</tr>
<tr>
<td>Gender: Female</td>
<td>38</td>
<td>77.5</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>41</td>
<td>83.7</td>
</tr>
<tr>
<td>Black/African American</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>8.2</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>2</td>
<td>4.1</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>27</td>
<td>55.1</td>
</tr>
<tr>
<td>Mean Age = 69.4 (n=45)</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
General Health

<table>
<thead>
<tr>
<th>Health Status</th>
<th>Count (n=49)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>2</td>
<td>4.1</td>
</tr>
<tr>
<td>Good</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Fair</td>
<td>21</td>
<td>42.9</td>
</tr>
<tr>
<td>Poor</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Very Poor</td>
<td>6</td>
<td>12.2</td>
</tr>
</tbody>
</table>

St. George Respiratory Questionnaire English for the U.S.
Respiratory Problems Over Last 3 Months

<table>
<thead>
<tr>
<th>Everyday to several days per week</th>
<th>(n=49)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coughed</td>
<td>33</td>
<td>67.3</td>
</tr>
<tr>
<td>Brought up phlegm (sputum)</td>
<td>23</td>
<td>46.9</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>34</td>
<td>69.4</td>
</tr>
<tr>
<td>Wheezing attacks</td>
<td>17</td>
<td>34.7</td>
</tr>
<tr>
<td>Severe respiratory attacks (3+)</td>
<td>12</td>
<td>24.5</td>
</tr>
</tbody>
</table>

St. George Respiratory Questionnaire English for the U.S.
## Health & Medical Care During Past Year

<table>
<thead>
<tr>
<th>Activity</th>
<th>(n=49)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overnight in the hospital</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Seen in an emergency room</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>Emergency visit to doctor/clinic</td>
<td>16</td>
<td>32.6</td>
</tr>
<tr>
<td>Treated with antibiotics for a chest illness</td>
<td>15</td>
<td>30.6</td>
</tr>
<tr>
<td>Daily medication use for respiratory problems</td>
<td>44</td>
<td>89.8</td>
</tr>
</tbody>
</table>
# Environmental Exposures Asthma Triggers

<table>
<thead>
<tr>
<th></th>
<th>(n=46)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air freshener used (1+ days/wk)</td>
<td>35</td>
<td>76.1</td>
</tr>
<tr>
<td>Candles/incensed used (1+ days/wk)</td>
<td>5</td>
<td>10.9</td>
</tr>
<tr>
<td>Signs of mice (past month)*</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Signs of cockroaches (past month)*</td>
<td>7</td>
<td>15.2</td>
</tr>
<tr>
<td>Mold or mildew</td>
<td>7</td>
<td>15.2</td>
</tr>
<tr>
<td>Gas Stove (NO &amp; NO2)</td>
<td>29</td>
<td>61.7</td>
</tr>
</tbody>
</table>

*2 household had signs of mice and cockroaches
## Environmental Exposures Asthma Triggers - Smoking

<table>
<thead>
<tr>
<th></th>
<th>(n=46)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject smokes</td>
<td>11</td>
<td>23.9</td>
</tr>
<tr>
<td>Others in household smoke</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Visitors smoke</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Smoke enters from other apartments/outside</td>
<td>12</td>
<td>26.1</td>
</tr>
</tbody>
</table>
Conclusion

• Prevalence of environmental asthma triggers
• Difficulties with exhaled Nitric Oxide (eNO) measurement using Niox Mino device
• Recruitment challenges
• Involve key partners to increase impact
• Importance of multi-cultural, multilingual lay community health outreach workers
Contact Information

David Turcotte, Sc.D.
University of Massachusetts Lowell
Email: David_Turcotte@uml.edu
Telephone: (978) 934-4682