Ongoing Research in Asthma and the Home Environment: The Mountain Air Project (MAP)

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The Mountain Air Project is...

- A community-based participatory study of respiratory disease in Letcher and Harlan Counties.

- 1st Aim: To determine the relative contribution of environmental factors and health behaviors on the burden of asthma and COPD.

- 2nd Aim: To test an intervention to improve asthma control and reduce ER visits.
## Disparities in Risk & Outcome

### Current asthma in adults ≥ age 18:

- **Appalachian Kentucky:** 18.9%
- **US:** 7.6%

### Current smoking in adults ≥ age 18:

- **Appalachian Kentucky:** 29%
- **US:** 15.1%

*BRFSS 2014-2016*
Map 3: Age-adjusted Asthma Inpatient Hospitalization Rates by County, Kentucky 2012

Age-Adjusted Rate of Asthma Hospitalizations (per 100,000 population)
- < 90.0
- 90.1 - 150.1
- 150.2 - 210.0
- 210.1 - 1490.3

Kentucky Age-Adjusted Asthma Hospitalization Rate:
139.8 per 100,000 population

Data Source: Office of Health Policy
Kentucky Cabinet for Health and Family Services
Study Design: CBPR

- **2013-2014**: Residents & faculty develop research questions.

- Residents note communities are defined by hollers.

- **Holler communities = USGS 14-digit Hydrologic Units (HUCs)**, chosen as the unit of sampling.
Methods: Household Enumeration

- HUCs randomly selected.
- All occupied homes in HUC enumerated.
- Random selection of starting point for recruiting, every \( n \)th home selected.
- Attention to safety.
- Recruiting of one adult from each selected home.
Methods: Data Collection

Community Workers trained in:
- Respiratory health
- Human subjects protections
- Interviewing skills
- Spirometry

Interviews in home or other convenient location.

Participants receive $40 incentive.
Mountain Air Project
Harlan County & Letcher County, KY

Participation by hydrologic unit (HUC-14)
Results: Enumeration & Participation

4115 Households Enumerated in study area

One Participant each from 1196 Households Consented

82.1% participation

N = 972 Individual Participants Complete Study: Interview Sample

N = 2409 Demographics of all family collected: Enumeration Database
Current Asthma (n = 2409)

Children ≤ age 17: 79 of 559 children = 14.21%
   Boys = 17.61%
   Girls = 11.26%

BRFSS 2015:
US - 8.4%

Adults ≥ age 18: 207 of 1818 adults = 11.39%
   Men = 9.6%
   Women = 13.32%

US - 7.6%
Letcher 14%
Harlan 19%
Results: Sample Demographics (n = 972)

- Men 401 (41.26%)  Women 571 (58.74%)
- Median Age: Men 55  Women 52  Range (21 – 96)
- Married/Partnered: 559 (57.3%)
- Employed Full or PT: 264 (27.2%)
- Retired or Disabled: 404 (41.6%)
Results: Sample Demographics (n=972)

Education HS/GED or Higher ≥ Age 25

- Letcher US Census: 73.5%
- Harlan US Census: 71.7%
- Interviewed Sample: 73.0%
Results: Sample Demographics (n=972)

Annual Household Income

- > $100,000: 3%
- $50,000 - $100,000: 12%
- $25,000 - $49,999: 14%
- $10,000 - $24,999: 20%
- < $10,000: 26%
- Don't know: 7%
- Decline to say: 17%

Note: Median Household Income (US Census 2016 est.):
Letcher Co. $30,333  Harlan Co. $25,814
Results: Interviewed Sample (n = 972)

- Lifetime Asthma age ≥ 21 years old = 218 (22.4%)

- Asthma Episode past 12 months = 75 (34.9%)

- 2nd Hand Smoke < age 16: 157 (72%)
## Results: Asthma Triggers in the Home (n=218)

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Smoker</td>
<td>73</td>
<td>33.5%</td>
</tr>
<tr>
<td>Kerosene Heat</td>
<td>18</td>
<td>8.3%</td>
</tr>
<tr>
<td>Mold in Home past 12 mths</td>
<td>37</td>
<td>17.2%</td>
</tr>
<tr>
<td>Unable to Afford Meds</td>
<td>64</td>
<td>29.5%</td>
</tr>
<tr>
<td>Vaporizer or Humidifier</td>
<td>76</td>
<td>34.9%</td>
</tr>
<tr>
<td>Cockroaches</td>
<td>16</td>
<td>7.4%</td>
</tr>
<tr>
<td>Pesticides in past 12 mth</td>
<td>81</td>
<td>37.3%</td>
</tr>
</tbody>
</table>
Results: Lifetime Asthma Risk (n=972)

Risk increased if:
- Live in public housing or mobile home.
- HUC with >median miles per square miles of highways.
(controlling for age, smoking, income etc.)
## The Asthma Intervention (n=200)

<table>
<thead>
<tr>
<th>4 Home Visits by RN:</th>
<th>Incentive Gifts:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma self-management</td>
<td>• Spacer for Inhaler</td>
</tr>
<tr>
<td>Reducing asthma triggers in home</td>
<td>• Allergen-proof mattress &amp; pillow covers</td>
</tr>
<tr>
<td>Healthy Homes inspection</td>
<td>• Green Cleaning Kit</td>
</tr>
<tr>
<td>Healthy Homes remediation or referral</td>
<td>• Merv 11 HVAC Filter</td>
</tr>
<tr>
<td></td>
<td>• Door mat</td>
</tr>
</tbody>
</table>
The Asthma Intervention: Training

- Curriculum for RN’s:

  “Asthma Education for the Community Health Worker”

Association of Asthma Educators
Asthma Intervention: Healthy Homes Resources

Healthy Housing Solutions Inc.

Healthy Homes Training Center

National Healthy Homes Training Center and Network

Project Funder: U.S. Department of Housing and Urban Development (HUD).

Project Description: The Training Center provides classroom courses through its network of partners around the country and through online courses.

To understand why healthy housing is so important, please watch this enjoyable, short video.

The target audiences for the training are environmental health practitioners, public health nurses, housing...
Asthma Intervention: HH Principles

- KEEP IT DRY
Asthma Intervention: HH Principles

- KEEP IT CLEAN
Asthma Intervention: HH Principles

- KEEP IT PEST-FREE
Asthma Intervention: HH Principles

- KEEP IT VENTILATED
Asthma Intervention: HH Principles

- KEEP IT SAFE
Asthma Intervention: HH Principles

KEEP IT CONTAMINANT-FREE
Asthma Intervention: HH Principles

- KEEP IT MAINTAINED
The Mountain Air Project Next Steps

- Analysis of intervention with 200 adults with asthma. *Did it help?*
- Sharing lessons learned with the community.
- Further research to include children.
- Bev’s wish list: Prescriptions for home remediation.

- Your ideas?
Thanks to...

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