

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



**BEVERLY MAY RN MSN DRPH CANDIDATE  
UNIVERSITY OF KENTUCKY  
COLLEGE OF PUBLIC HEALTH**



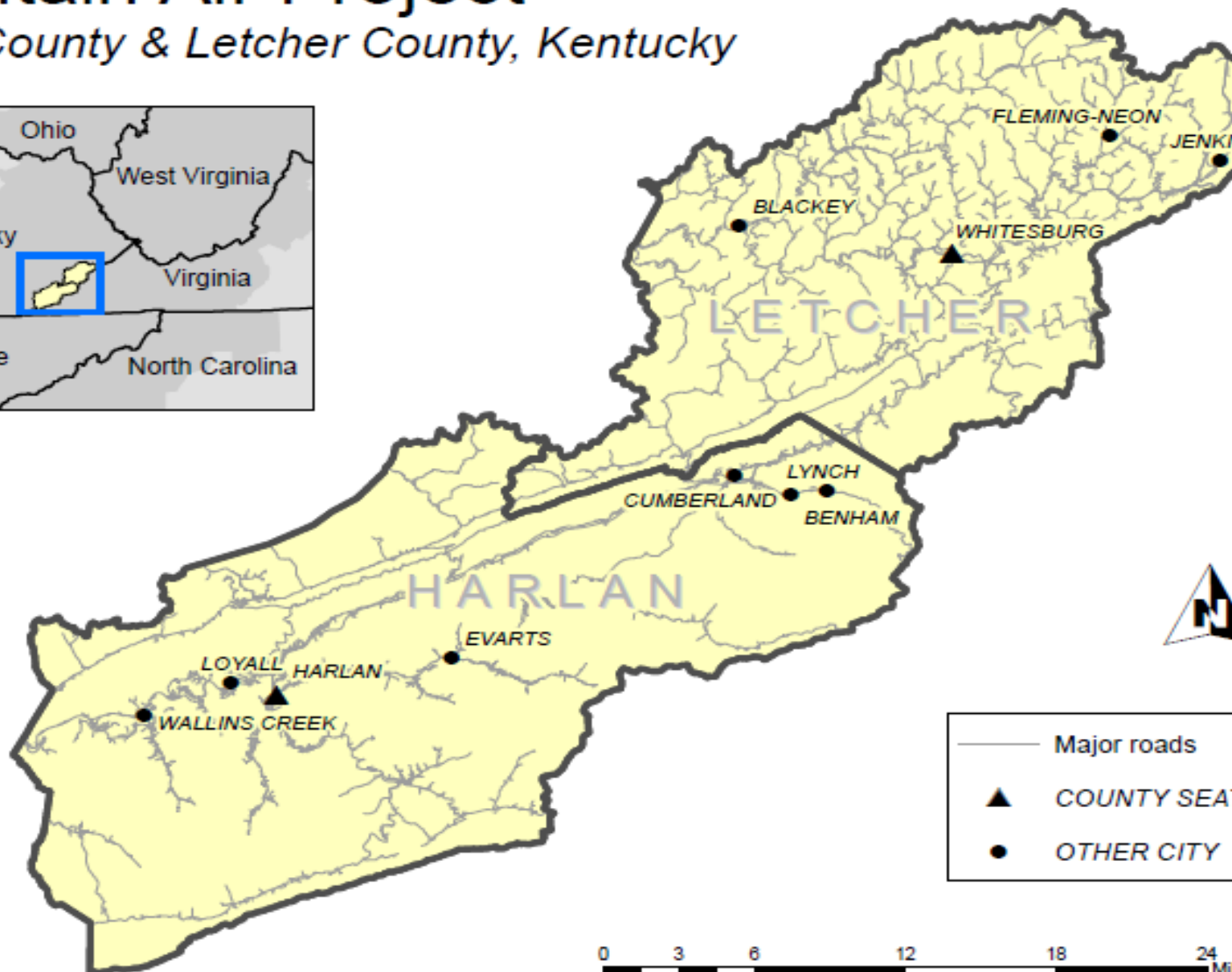
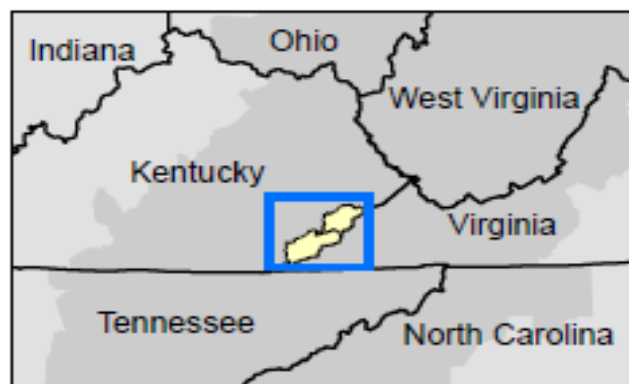
# The Mountain Air Project is...



- 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.

# Mountain Air Project

*Harlan County & Letcher County, Kentucky*



# Disparities in Risk & Outcome



**Current asthma in  
adults  $\geq$  age 18:**

**Appalachian  
Kentucky: 18.9%**

**US: 7.6%**

**BRFSS 2014-2016**

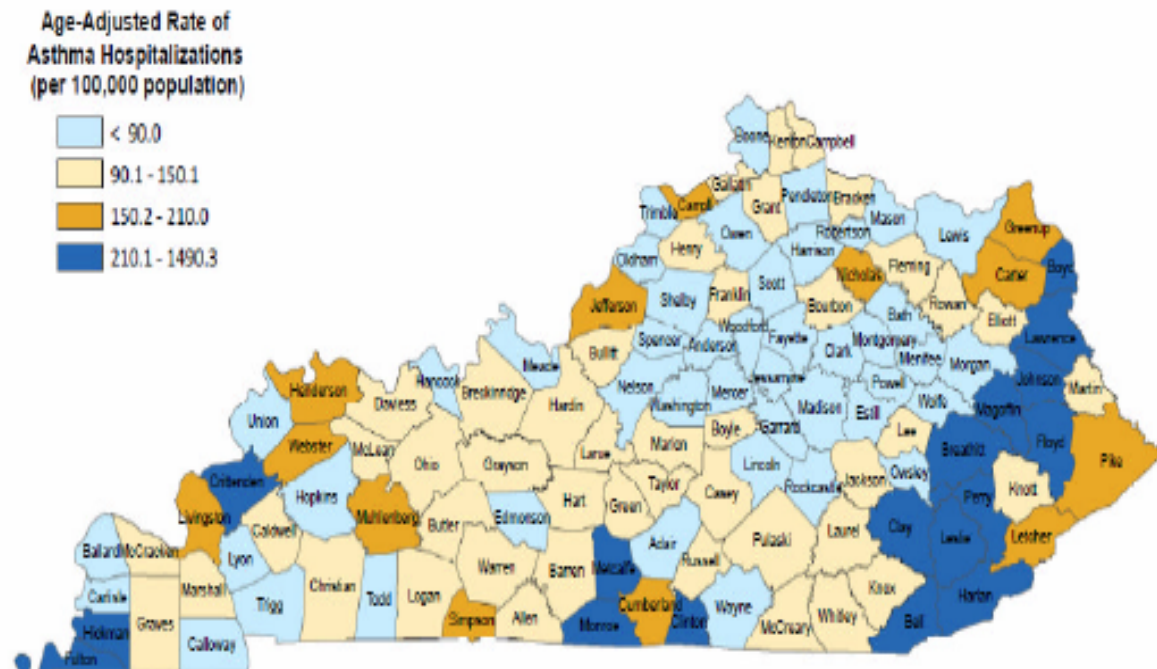
**Current smoking in  
adults  $\geq$  age 18 :**

**Appalachian  
Kentucky: 29%**

**US: 15.1%**

**BRFSS 2014-2016**

### Map 3: Age-adjusted Asthma Inpatient Hospitalization Rates by County, Kentucky 2012



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.

Brown wood frame	
White wood frame & UK BLUE	Pretty Christmas deco
White house	
Brown big glass doors	
Small house with some brick	
Small Red house	
Double wide	Big dogs
	Big bad dogs
	BIGGER BADDER DOG
Tan wood frame 2 story	Park on other side of Road Allen Boggs
Red house with fence	Park on Left of highway
Wood frame	Not driveway entry
Big White house BIG white fence	Nantz Horse farm



# Methods: Data Collection

## **Community Workers trained in:**

- **Respiratory health**
- **Human subjects  
protections**
- **Interviewing skills**
- **Spirometry**

**Interviews in home or  
other convenient  
location.**

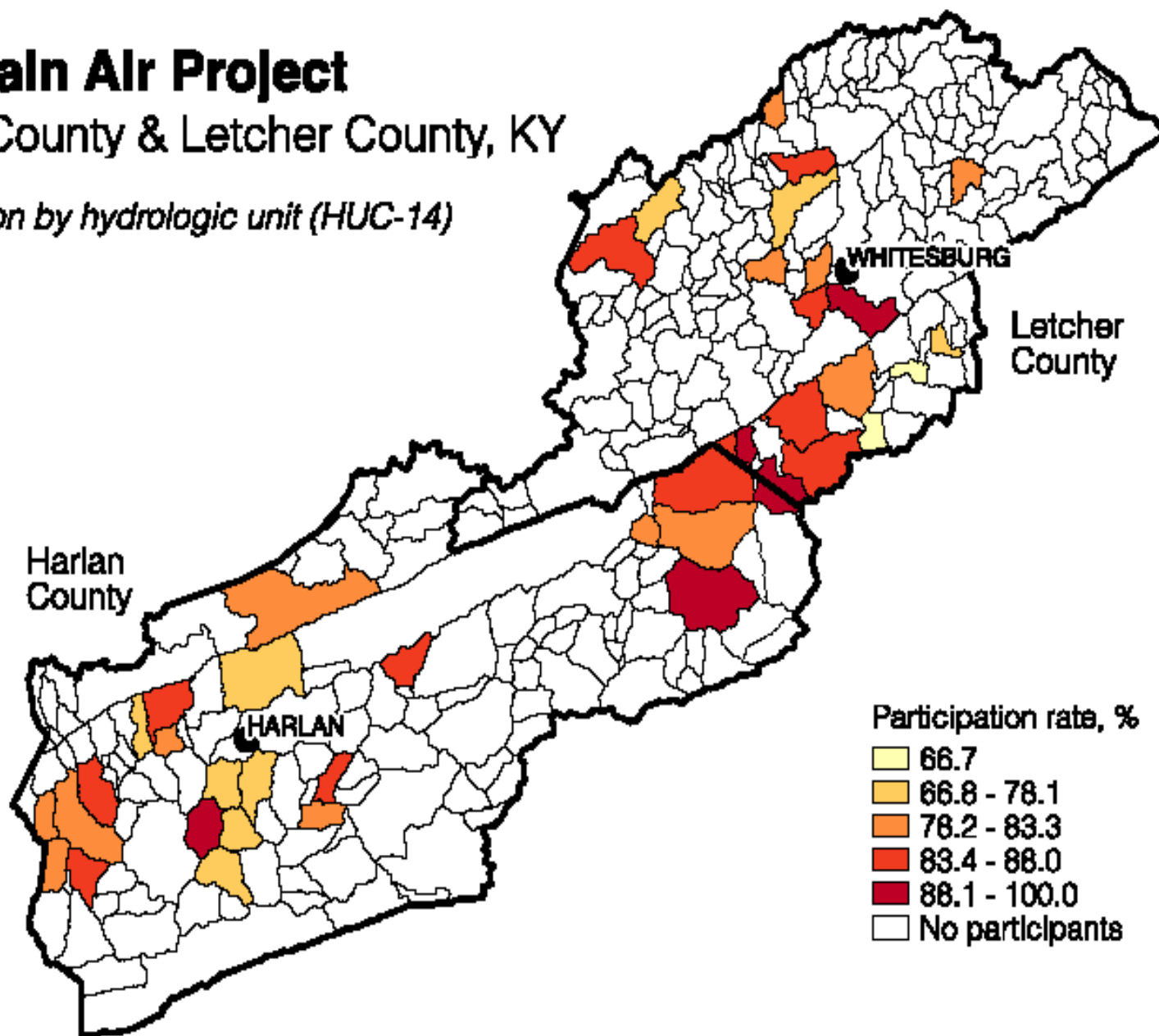
**Participants receive  
\$40 incentive.**



# 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**

# Results: Asthma in Households Contacted (n=2409)



## 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)

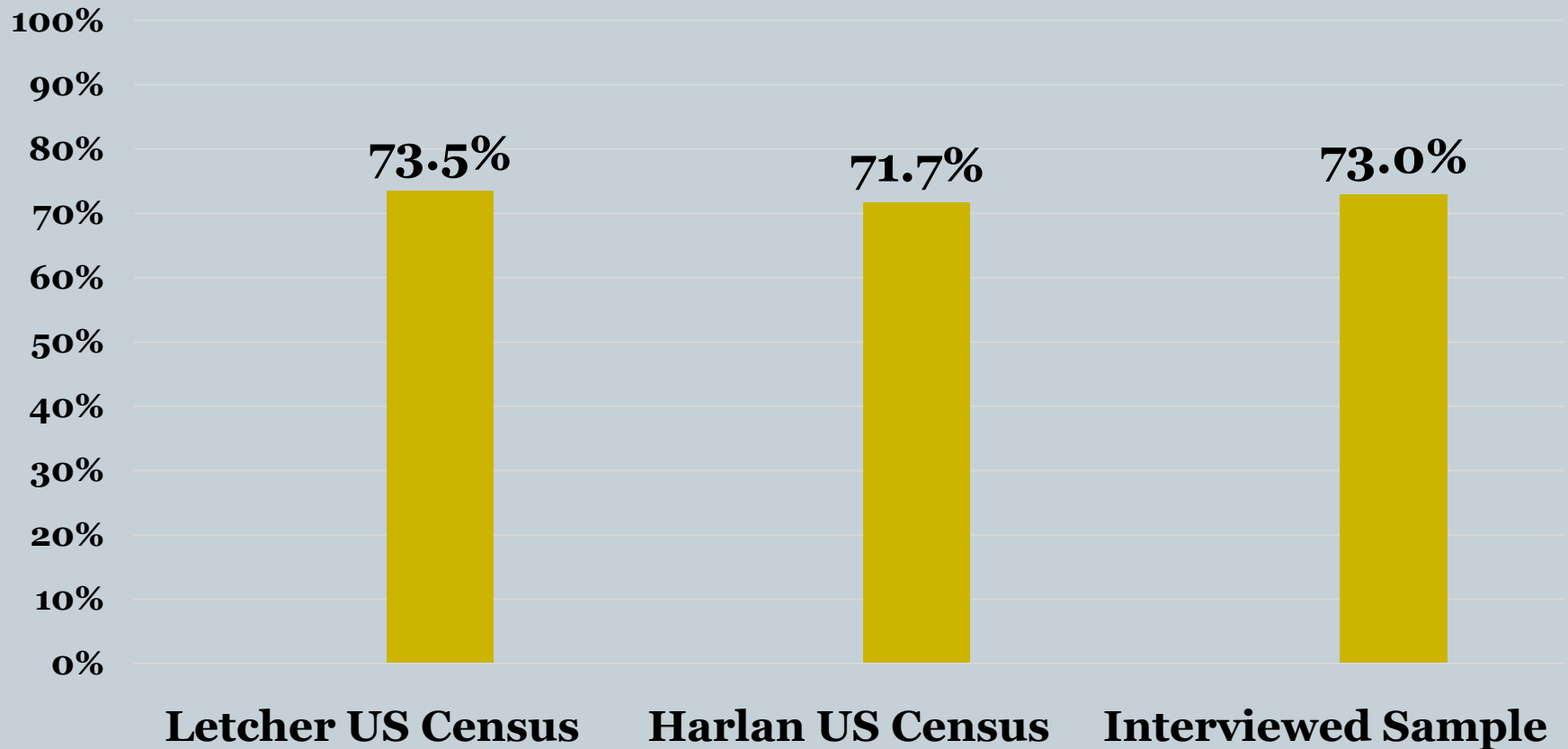


- Men 401 (41.26%)      Women 571 (58.74%)
- Median Age: Men 55   Women 52   Range (21 – 96)
- Married/Partnered : 559 (57.%)
- Employed Full or PT: 264 (27.2%)
- Retired or Disabled: 404 (41.6%)

# Results: Sample Demographics (n=972)



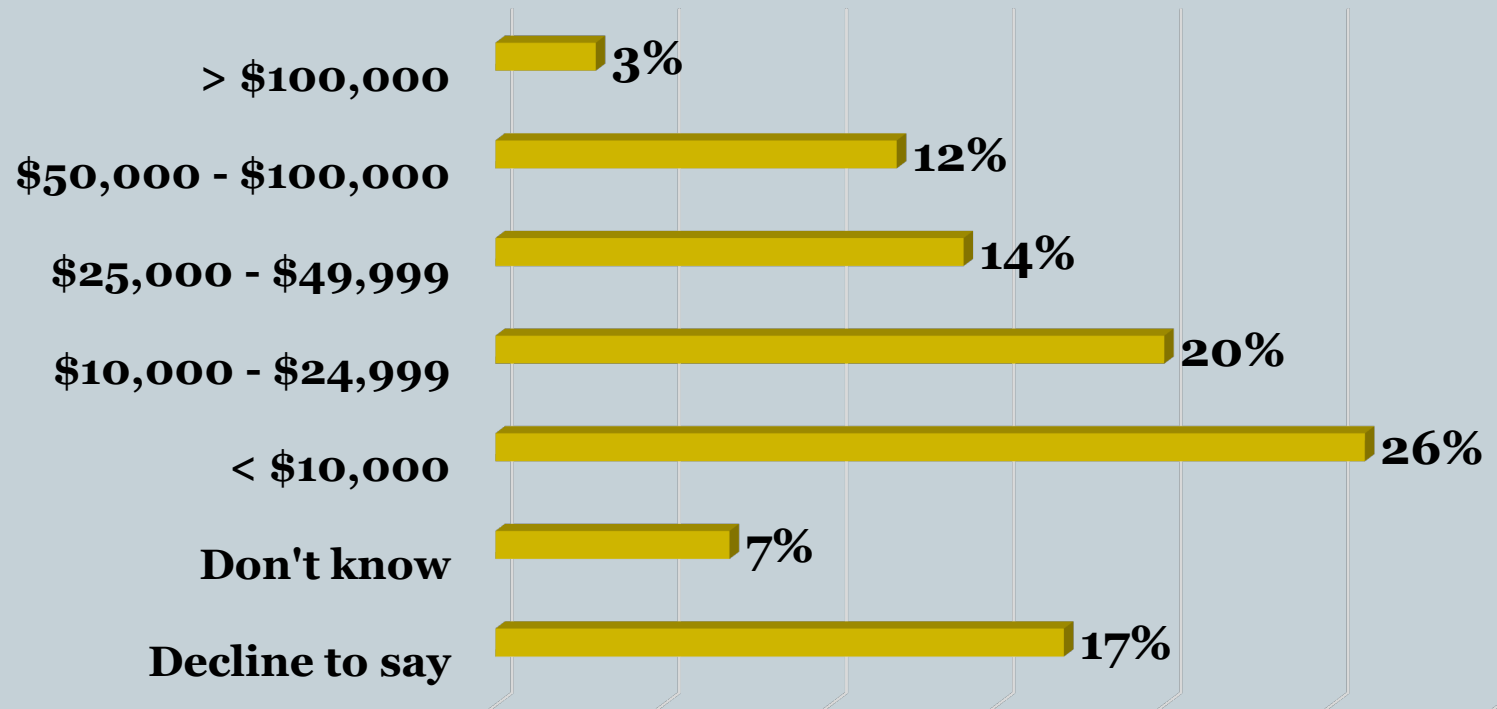
## Education HS/GED or Higher $\geq$ Age 25



# Results: Sample Demographics (n=972)



## Annual Household Income



**Note: Median Household Income (US Census 2016 est.):**  
Letcher Co. \$30,333 Harlan Co. \$25,814



# Results: Interviewed Sample (n = 972)

- Lifetime Asthma age  $\geq 21$  years old = 218 (22.4%)
- Asthma Episode past 12 months = 75 (34.9%)

2<sup>nd</sup> Hand Smoke < age 16:  
157 (72%)



## Results: Asthma Triggers in the Home (n=218)



• Current Smoker :	73	33.5%
• Kerosene Heat:	18	8.3%
• Mold in Home past 12 mths:	37	17.2%
• Unable to Afford Meds:	64	29.5%
• Vaporizer or Humidifier:	76	34.9%
• Cockroaches:	16	7.4%
• Pesticides in past 12 mth:	81	37.3%

# 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)

## 4 Home Visits by RN:

Asthma self-management  
Reducing asthma triggers  
in home  
Healthy Homes inspection  
Healthy Homes  
remediation or referral

## Incentive Gifts:

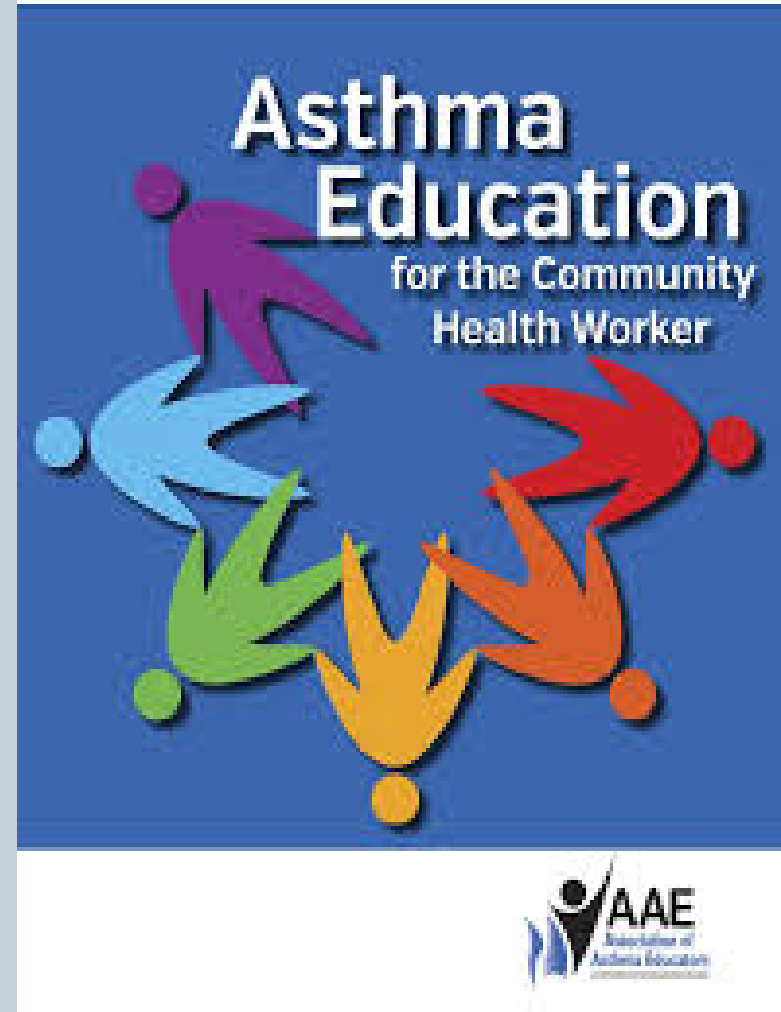
- Spacer for Inhaler
- Allergen-proof mattress & pillow covers
- Green Cleaning Kit
- Merv 11 HVAC Filter
- Door mat

# 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.

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## Healthy Homes Training Center

HOME : 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

#### Healthy Homes Training Center

- Face-to-Face Courses
- Self-Paced Courses
- Schedule of Classes
- Training Partners
- AHS Data
- State Housing Codes
- Healthy Homes Library

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# 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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**Dr. Steve Browning, UK College of Public Health, Epidemiology**

# And thanks to you!



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