



# Welcome to the Webinar

## Housing & Health: A Look at Effective Interventions for People with Asthma

**Moderator:** Tracy Washington Enger, U.S. Environmental Protection Agency

**Presenters:**

- **Dorr G. Dearborn**, PhD, MD, Swetland Center for Environmental Health, Department of Environmental Health Sciences, School of Medicine, Case Western University
- **Stuart Greenberg**, Environmental Health Watch (EHW), Community Housing Solutions

***Thursday, March 19, 2013***

*Webinar 2:00 – 3:00*

*Live online Q&A 3:00 – 3:30 on [AsthmaCommunityNetwork.org](http://AsthmaCommunityNetwork.org)*

***Call-In Information:***

**Phone-Number:** (877) 430-6516

**Access Code:** 93827309



# Introduction

**Tracy Washington Enger**  
**U.S. Environmental Protection Agency**

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# Purpose of Webinar


## To learn about...

- Essential components that make asthma home visits effective in this healthy homes program model
- Environmental home interventions with sufficient evidence for implementation
- Cost and health impact data necessary to demonstrate cost savings
- An effective collaboration with proven results

# EPA's Commitment to Reducing Asthma Disparities

May, 2012 [www.epa.gov/childrenstaskforce](http://www.epa.gov/childrenstaskforce)

## President's Task Force on Environmental Health Risks and Safety Risks to Children



Coordinated Federal Action Plan  
to Reduce Racial and Ethnic  
Asthma Disparities

## Strategy One

**Reduce barriers to the implementation of guidelines-based asthma management.**

### Priority Actions:

#### 1.3 In homes, reduce environmental exposures.

- Encourage federal grantees who conduct home visits for asthma to adopt the relevant Task Force on Community Preventive Services' Community Guide recommendations, and encourage federal partners who support home visit programs to do the same (<http://www.thecommunityguide.org/asthma/multicomponent.html>)
- Recommend that owners and managers of federally assisted housing implement building-wide practices and policies that reduce exposures to secondhand smoke, pests, mold and other asthma triggers.
- Encourage state and local governments to consider strategies to help reduce exposure to secondhand smoke, pests, mold and other asthma triggers in homes.
- **Key Organizations Involved:** CDC, CPSC, DOE, EPA, HUD and USDA.



# Agenda

1. Describe the System for Delivering High-Quality Asthma Care
2. Presentations:
  - **Dorr G. Dearborn, PhD, MD**, Swetland Center for Environmental Health, Department of Environmental Health Sciences, School of Medicine, Case Western University
  - **Stuart Greenberg**, Environmental Health Watch (EHW), Community Housing Solutions
3. Q&A Session in AsthmaCommunityNetwork.org Discussion Forum



## Questions & Answers Session in AsthmaCommunityNetwork.org Discussion Forum

**Do you have questions?** Dorr and Stuart will be available online in the **AsthmaCommunityNetwork.org Discussion Forum** from **3:00-3:30 p.m. EDT today** to respond to questions you post in the Discussion Forum. To post a question in the Discussion Forum, follow these directions:

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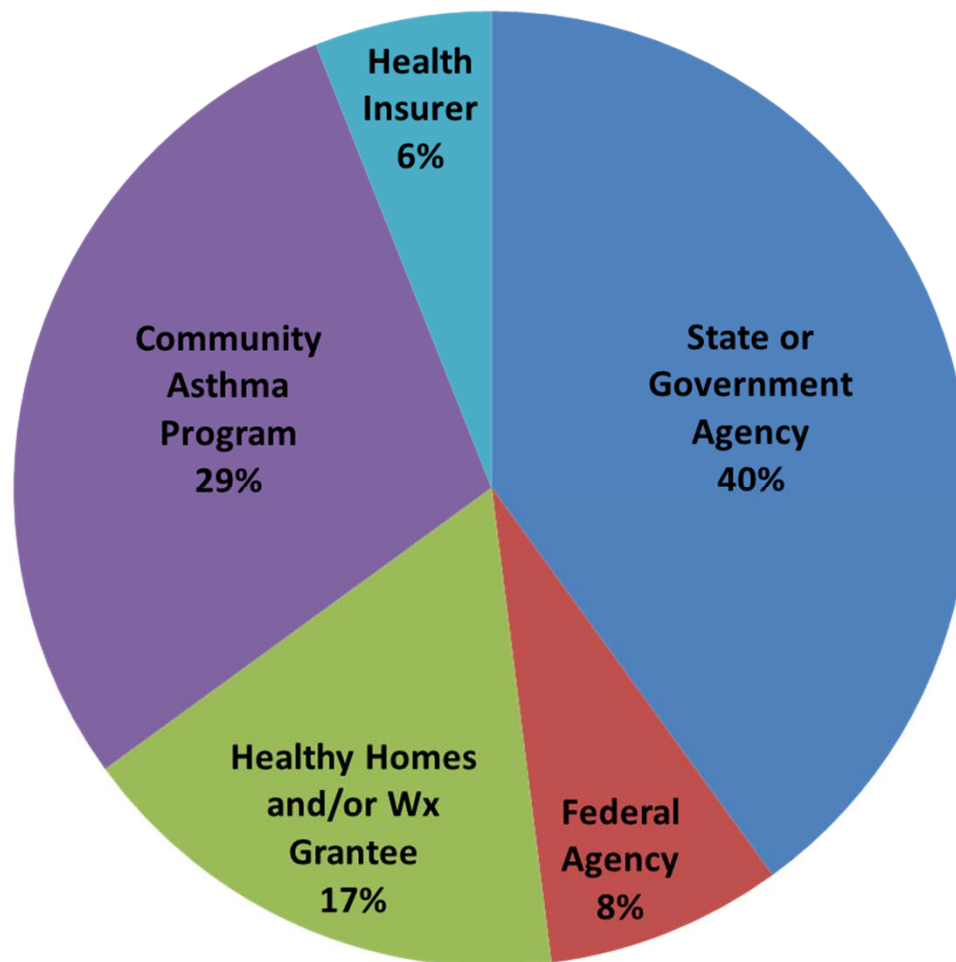
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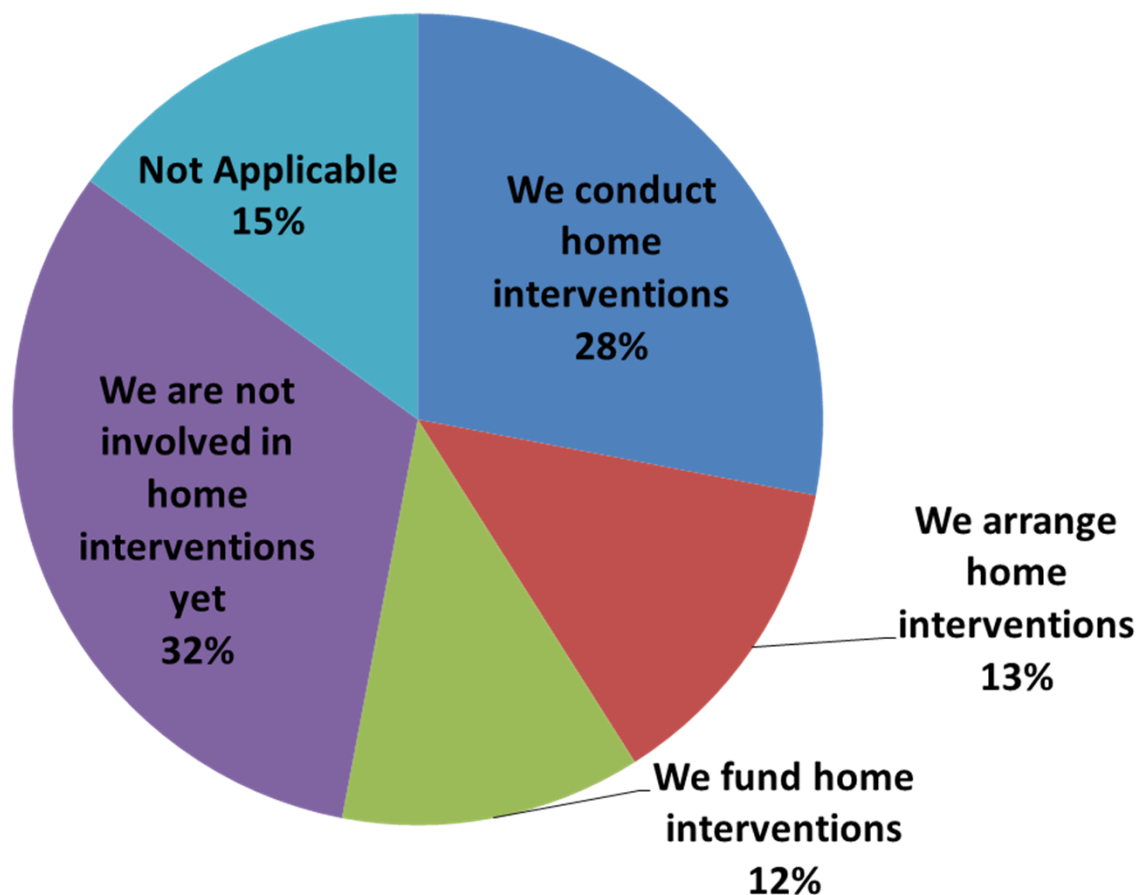
## Poll 1

**What type of organization do you represent?**



## Poll 2

**How is your organization currently involved in home interventions for people with asthma?**

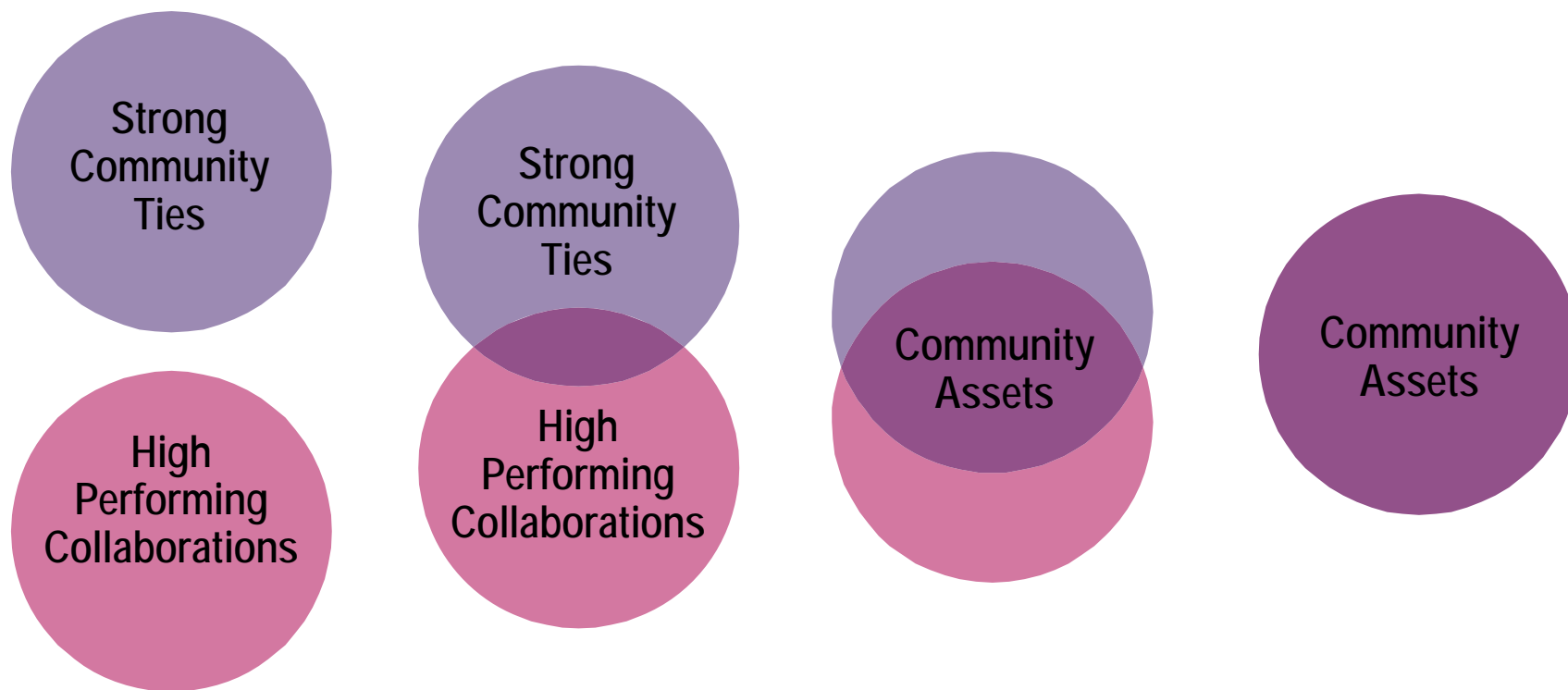


# Connecting to the *System*





## Connecting to the *System*



# ASTHMA HOME VISITS: THE NEED, THE VALUE, & TIME FOR FEE-FOR-SERVICE

Dorr G. Dearborn, PhD, MD

Swetland Center for Environmental Health

Department of Environmental Health Sciences



SCHOOL OF MEDICINE

CASE WESTERN RESERVE  
UNIVERSITY

# Hospitalization for Asthma is a Failure of Medical Care

## MAJOR DIFFICULTIES:

- COMPLIANCE (EDUCATION/CASE MANAGEMENT)
- ENVIRONMENTAL TRIGGERS (HOME)

# HOW LARGE IS THE PROBLEM?

## Asthma

### Lifetime

### Current

### NATIONALLY (CDC, 2012)

Children

13.6%

9.4%

Med expenses =\$50.1 billion/yr; 479,300 hospitalizations/yr

### CUYAHOGA COUNTY (mid sch, YRBS, 2010)

White

18.1%

9.9%

Black

24.5%

14.7%

Hispanic

28.0%

16.0%

### City of CLEVELAND (high sch, YRBS, 2009)

White

24.0%

16.7%

Black

24.6%

13.7%

Hispanic

31.1%

15.0%

# **ASTHMA HOSPITALIZATIONS**

## **Rainbow Babies & Children's Hospital**

	<u><b>2011</b></u>	<u><b>3 years</b></u>
<b>Asthma hosp (0-19yr):</b>		
Primary admit Dx	<b>516</b>	<b>1512</b>
Dx asthma included	<b>1642</b>	
Hosp including PICU	<b>32.6%</b>	
Re-admits within 30 d		<b>3.44%</b>
Ave length of stay	<b>2.7 d</b>	<b>2.65 d</b>

## **MetroHealth Medical Center**

<b>Asthma hosp (0-19yr):</b>	<b>550</b>
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# **ASTHMA HOSPITALIZATIONS**

## **Rainbow Babies & Children's Hospital**

### **PAYERS**

**2011**

**Asthma hosp (0-19yr):**

<b>COMMERCIAL</b>	<b>6.4 % (33)</b>
<b>MANAGED CARE</b>	<b>12.8 % (66)</b>
<b>MEDICAID</b>	<b>78.7 % (406)</b>
<b>SELF PAY</b>	<b>2.1 % (11)</b>

# MEDICATION APPROACH

- Controller medications (e.g. aerosolized steroids)
- Rescue medications (e.g. albuterol)
- XOLAIR (omalizumab)
  - Subcutaneous injection every 2-4 weeks
  - Costs (RB&C Asthma Center experience):
    - Transportation/parking for clinic (family burden)
    - 25% effort for a nurse
    - \$1500-\$2200 /injection → **\$19,000 - \$57,600 /year**  
(Medicaid allowed charges; 72% high end)

# ENVIRONMENTAL APPROACH

## NIH Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma 2007

- For asthma management, essential to control relevant inhalant allergens and irritants—especially **in the home**
- Reducing exposure can reduce inflammation, symptoms, need for medication
- Multifaceted, **in-home interventions** effective; single steps generally not
- Determine inhalant sensitivity

<http://www.nhlbi.nih.gov/guidelines/asthma/>

# RECOMMENDATIONS FOR ASTHMA HOME VISIT PROGRAMS

- National Asthma Education and Prevention Program (**NAEPP**) Expert Panel Report, “Guidelines for the Diagnosis and Management of Asthma” (**NHLBI**, 2007)
- Asthma Health Outcomes Project (AHOP) (**EPA, 2008**)
- Task Force on Community Prevention Services (the **Task Force: CDC, 2008**)
- The Global Initiative for Asthma (**GINA, 2010**)

# HOME ENVIRONMENT APPROACH

- Smoke-free home policies for indoor areas;
- Multifaceted, tailored interventions for reducing asthma morbidity;
- Integrated pest management (IPM) to reduce cockroach allergen; and
- Combined elimination of moisture intrusion and leaks and removal of moldy items to reduce mold and respiratory symptoms.

Kreiger et al, J Public Hlth Management & Practice, 2010, 16(5 Suppl):S11-20.

# CASE HEALTHY HOMES AND PATIENTS PROGRAM (CHHAP)

## BASIC ASTHMA PROGRAM (RB&C Asthma Center):

1. Pediatric Pulmonary physician refers their patient for a home visit; a Home Health Inspector from Environmental Health Watch (often accompanied by a pulmonary fellow) goes to the patient's family's home for an inspection.
2. Action Plan is devised
  - Pulmonary Fellow: Behavior education (HUD booklet)
  - HH Inspector: Home health & safety items provided, Home interventions provided / referred
3. Pulmonary Fellow tracks patient's health events

# CHHAP- Three Year Outcomes

## ASTHMATIC CHILDREN-

- Clinical Outcomes- Project patients (n = 27):
  - Compared hospitalizations for the year prior to home visit to the year after the visit

Previous Year:	<u>#</u>	<u>annual rate</u>	
Hosp	50	1.85	
PICU	19	0.38	
30 d Re-Admit	6	0.12	
Year after home visit:			<u>% decrease</u>
Hosp	21	0.78	58%
PICU	7	0.33	63%
30 d Re-Admit	0	0.0	100%

# OPTIMAL HOME VISIT PROGRAM

- TARGET ASTHMA POPULATION
  - Hospitalized
  - Prescribed Xolair
- PHYSICIAN REFERRAL
  - Written medical care plan
  - Allergen prick testing
- HOME VISIT STRUCTURE
  - Environmental triggers
  - Hands-on trigger education of family
  - Cont'd care plan education
- SERVICE PROVIDERS (certified)
  - Supported by fee system

# Cost-Effectiveness

STUDY	PROGRAM COSTS <sup>1</sup>	MEDICAL COST SAVINGS <sup>1</sup>	BENEFIT/COST
Minnesota (Oatman,2007) <sup>2</sup>	\$497	\$2,637	5.3
Seattle (Krieger, 2005) <sup>2</sup>	\$1316	\$124-147	0.09-0.11
ICAS (Kattan, 2005) <sup>2</sup>	\$1720	\$555	0.32
Boston (Woods, 2012) <sup>3</sup>	\$2529	\$3827	1.4
Baltimore <sup>4</sup> (2012)+	\$1386	\$2217	1.6

1 Average values per participant per year

2 from, Nurmagambetov et al., Am J Prev Med 2011, 41:S33-S47

3 Woods, et al., Pediatrics 2012, 129:465

4 K Scott, P McLaine, M Shea, Baltimore City Health Department,  
kate.scott@bmsi.org

# Health Impact Bonds: Fresno, CA pilot program

- 200 asthmatic children selected based on expense profiles with Medi/Cal
- HI Bond will pay for in-home interventions
  - Community health workers; environment & case management; monthly calls, quarterly home visits
- Project 30% reduction in ED, 50% decrease in hospitalizations --> net savings \$5,000 per pt/yr
- Investors receive a portion of the savings

<http://ehp.niehs.nih.gov/2013/02/121-a45/>

# **ASTHMA HOME VISITS**

## **Current Strategy**

### **GOAL**

- Fee for service funding for home visits

### **PROCESS**

- Bring together Ohio Healthy Homes grantees to address complexities and uniformity
- Obtain Ohio Medicaid endorsement/facilitation (not asking for funding)
- Educate and enlist medical insurers
- Institute pilot program in Cuyahoga County



# Discussion with **DR. DORR DEARBORN**

# Case Healthy Homes & Patients Program – Asthma Home Interventions



Stuart Greenberg  
Environmental Health Watch (EHW)



## Case Healthy Homes & Patients Program (CHHAP) - Purpose

- To provide hands-on environmental health experience to physicians in training regarding the health and safety aspects of inner city housing
- To provide health and safety home improvements to their clinic patients.

*Zickafoose, J, Greenberg S, Dearborn DG, Teaching Home Environmental Health to Resident Physicians, **Public Health Report**, 2011, 126 Suppl 1:7-13.*
- Component included to assess feasibility of responding to children recently hospitalized for asthma and integrating home visits with clinical care.



## CHHAP asthma component

- Patient referral - Pediatric Pulmonology
- Patient phone interview - Swetland nurse
- Peds. Pul. Fellow & EHW staff visit home – initial assessment & site-specific education
- Follow-up EHW intervention visits (1-4)
- Referrals to other agencies
- At Peds Pul Clinic follow-up visit, trigger control reinforced



# EHW asthma home visit staff



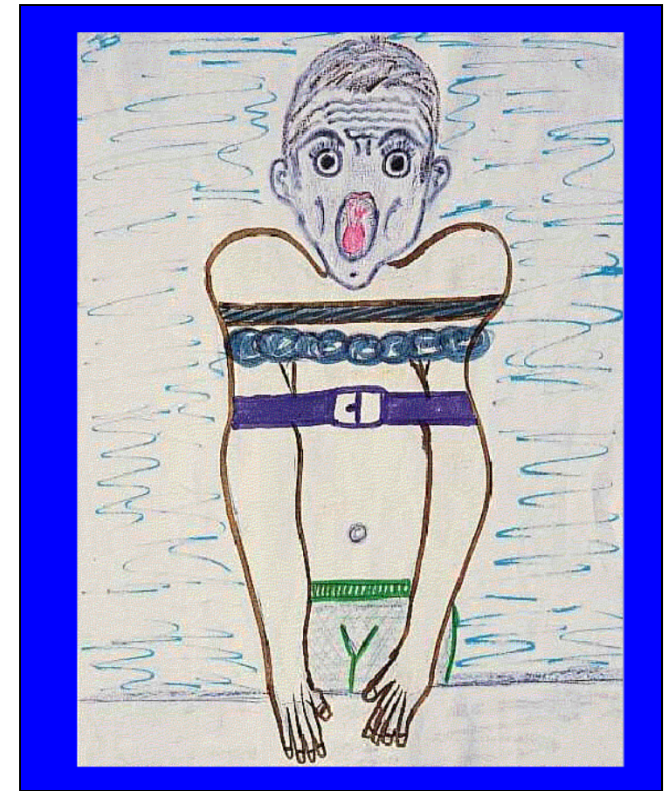
Akbar Tyler,  
Certified Healthy Home  
Specialist



Kim Foreman,  
Certified Asthma  
Educator

# Family asthma management tasks

1. Assess and control home environmental triggers
2. Manage medication regimen
3. Anticipate and respond to exacerbations
4. Use health care system effectively
5. Communicate with childcare and school personnel



# Asthma trigger sources



## Inhalant Allergens

- House dust mites
- Cockroaches
- Warm-blooded pets
- Rodents
- Mold

## Respiratory Irritants

- ETS
- Formaldehyde
- VOCs
- Combustion by-products
- Outdoor pollution

# Triggers assessment – sensitivity and exposure

- Skin test for allergic sensitivity
- Home exposure inspection
  - Occupant interview
  - Exterior & interior inspection with EHW staff, family members and Peds. Pul. Fellow
- Targeted trigger interventions - more effective, less costly, reduced family burden



# Asthma interventions based on healthy house approach

- Address multiple hazards - most from common and interacting housing failures -less costly, more effective
- Currently, two HUD HH projects have asthma triggers focus integrated with weatherization –
  - *City-County HH Initiative*, led by Cuyahoga County Board of Health
  - *Warm & Healthy Homes*, led by EHW, with the Cleveland Department of Community Development, this continues the CHHP involvement of physicians, additional GHHI funding

# Weatherization & Health - Resources



- Federal Agencies - *Advancing Healthy Housing* – HUD, DoE, DHHS,
- DoE Weatherization Assistance Program – *Weatherization Plus Health*
- National Center for Healthy Housing – *Health Opportunities in Energy Audits and Upgrades*
- Green & Healthy Housing Initiative – *Making Housing Green & Healthy through Weatherization*



# Asthma trigger interventions

- EHW
  1. Family education
  2. Health & safety items [moderate]
  3. Pest control, small repairs/remediation [moderate]
  4. Referral agencies – furnace repair, roof repair, mold remediation [major]
- Family – e.g., smoke outside, no pest sprays
- Pulmonary Fellows – at clinic visits, reinforce behavior changes



# Systematic Review of Housing Interventions and Health

– CDC & National Center for Healthy Housing (NCHH)

## Interventions with sufficient evidence for implementation

Smoke-free home

Multifaceted, tailored asthma environmental trigger reduction

Cockroach control through integrated pest management (IPM)

Pesticide exposure reduction through IPM

Moisture reduction and removal of moldy material

[http://journals.lww.com/jphmp/Fulltext/2010/09001/Housing\\_Interventions\\_and\\_Control\\_of.3.aspx](http://journals.lww.com/jphmp/Fulltext/2010/09001/Housing_Interventions_and_Control_of.3.aspx)

# Interventions for rapid trigger exposure reduction –

## 1. HEPA vacuum & 2. bedding covers

1. Provide HEPA vacuum cleaner – to reduce allergen/irritant particulate loadings on surfaces and in reservoirs (e.g., carpet, upholstered furniture) [\$140 with extra belts & HEPA bags]
2. Provide allergen-impermeable mattress and pillow covers – to reduce exposure to dust mites (and other allergens/irritants that migrate to bedding) [\$40-\$60]



# Interventions for rapid trigger exposure reduction –

## 3. IPM for roaches & mice

- Family – environmental controls
- Integrated Pest Management (IPM) for cockroach control [contractor \$150-\$500] –
  - flush potential harborages with hot air gun,
  - HEPA vacuum to immediately capture live roaches, roach parts, eggs, and other allergenic material,
  - bait identified harborages IPM



## Interventions for rapid trigger exposure reduction –

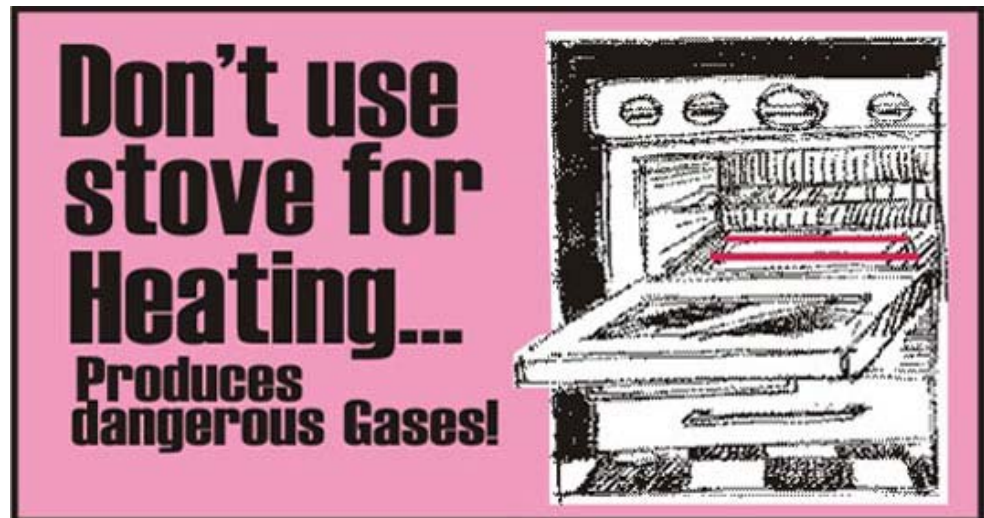
# 4. clean/decontaminate/declutter

- Cleaning to reduce trigger contamination and clutter (which impedes cleaning & IPM)– HEPA vacuuming, wet washing, removal of contaminated material (program staff, family, or contractor)
- Provide storage bins and shelves to reduce clutter [\$20-\$50]
- Have carpets professionally cleaned, with additional extraction step to reduce the potential for residual moisture leading to mold growth [\$150-\$500]



## Interventions for rapid trigger exposure reduction – 5. electric space heaters, 6. furnace filters

- Provide electric space heaters – to eliminate use of gas stove & unvented fuel-burning heaters for room heating and the related combustion gas exposure. [\$80]
- Replace furnace filters and provide additional pleated filters [\$15]



## Interventions for rapid trigger exposure reduction – 7. bedroom safe space

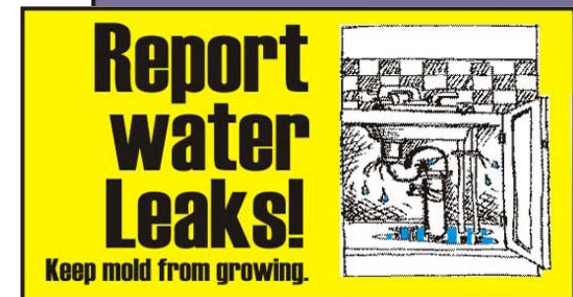
- Help the family create & maintain the bedroom as an area of reduced trigger loading
  - Provide HEPA room air cleaner for bedroom [\$200]
  - Make site-specific recommendations, e.g., keep doors closed, bare floors, reduce dust collectors, smoke-free, pet free, no irritant cleaning or “air freshening” products, etc.



# Interventions for rapid trigger exposure reduction –

## 8. occupant behavior

- Pest control practices
- Smoking - provide “Smoke-free Home” and “Smoke-free Car” signs
- Pets management
- Household cleaning and “air freshening” products
- Dust reduction
- Moisture reduction
- Bedding covers
- Humidifier cautions





## EHW asthma home visit costs

- Trigger control equipment, materials & contractors:
  - Equipment & materials: \$300-\$550
  - Contractor work (IPM &/or cleaning): \$150-\$1,000
  - Combined: \$300-\$1550.
- Staffing costs (2-4 visits): \$400-\$800.
- Total costs: \$700-\$2,350.

Thanks for your attention



*... green housing  
for people who  
need it the most.*

**AFFORDABLE GREEN  
HOUSING CENTER**



**EHW**  
**ENVIRONMENTAL  
HEALTH WATCH**



# Discussion with **STUART GREENBERG**



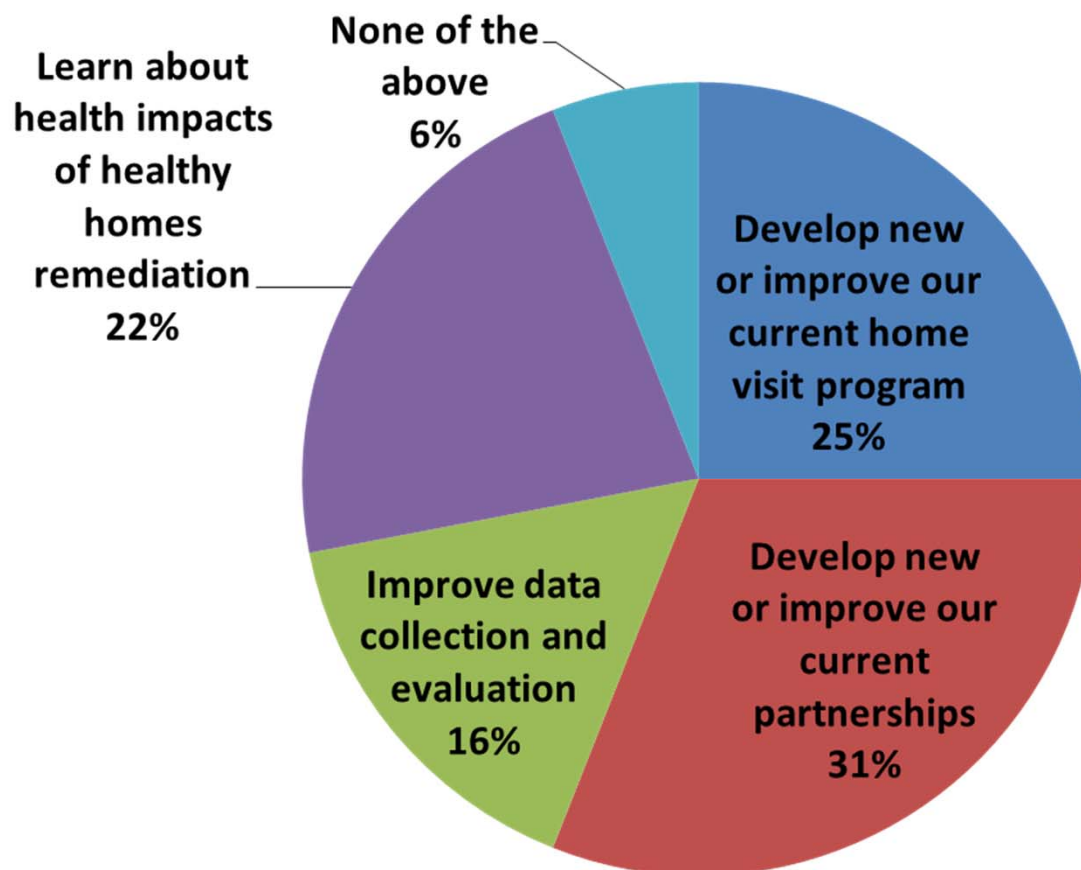
# Discussion with

## **DR. DORR DEARBORN & STUART GREENBERG**



## Poll 3

Based on what you learned in the webinar, which of the following actions will you prioritize for your program?





# Purpose of Webinar

## To learn about...

- Essential components that make asthma home visits effective in this healthy homes program model
- Environmental home interventions with sufficient evidence for implementation
- Cost and health impact data necessary to demonstrate cost savings
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# Conclusion of the Webinar

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