Welcome to the Webinar



A New Tool for Asthma Home Visiting Programs: The Environmental Scoring System

Moderator

Tracey Mitchell, RRT, AE-C, U.S. Environmental Protection Agency (EPA)
 Presenters

- Erica Marshall, MPH, Massachusetts Department of Public Health
- Anjali Nath, MPH, Boston Public Health Commission

Tuesday, September 11, 2018

Webinar: 1:00 p.m. – 2:00 p.m. EDT Live Online Q&A: 2:00 p.m. – 2:30 p.m. EDT on AsthmaCommunityNetwork.org

Operator-Assisted Toll-Free Dial-In Number: (866) 527-8921 Conference ID: 8988036

Indoor Air Quality (IAQ)

Polling Question 1

Which type of organization do you represent?

- 1. Federal, state or local agency
- 2. Health care provider
- 3. Health plan
- 4. Community asthma program
- 5. Other

Learning Objectives



- What the Environmental Scoring System is and how it was developed
- How the Massachusetts Department of Public Health and the Boston Public Health Commission have used and evaluated this tool
- How you can apply the Environmental Scoring System in your asthma home visiting program

Polling Question 2



Which part of today's webinar will be most valuable to you and your work?

- 1. What the Environmental Scoring System is and how it was developed
- 2. How the Environmental Scoring System was evaluated
- 3. How to apply the Environmental Scoring System in my own asthma home visiting program
- 4. Other

Immediately after the webinar, join us in the AsthmaCommunityNetwork.org Discussion Forum for a live online Q&A Session:

2:00 p.m. – 2:30 p.m. EDT

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1. If you are a Network member, log in to your AsthmaCommunityNetwork.org account.

Not a member? Create an account at **AsthmaCommunityNetwork.org** by clicking the "**Join Now**" link at the top of the page. Your account will be approved momentarily and you can begin posting questions.

- 2. Click on the "Discussion Forum" button on the home page.
- 3. Click on the "Live Online Q&A for 9/11/18 Webinar" link.
- 4. Click on the "Post to the Forum" link to post your question.
- 5. Enter your question and click the "Save" button at the bottom of the page.



Supporting States and Communities to Deliver High-Value, Comprehensive Asthma Care

Tracey Mitchell, RRT, AE-C U.S. Environmental Protection Agency (EPA)

Asthma Is a Public Health Challenge Characterized by Disparities



Environment Plays a Critical Role in Asthma Control

- Federal asthma guidelines recognize environmental trigger reduction as a critical component of comprehensive asthma care.*
- The evidence base demonstrates that in-home environmental interventions are effective at improving asthma control in children and adolescents.[†]

EPA is a federal lead for integration of environmental risk reduction into standards of care.



* NHLBI. Guidelines for the Diagnosis and Management of Asthma (EPR-3). 2007. www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines

† CDC. The Guide to Community Preventive Services. 2005. www.thecommunityguide.org

Supporting In-Home Interventions to Bring Asthma Under Control



EPA-BPHC Partnership



Technical Assistance to Promote In-Home Interventions

BPHC and Boston Medical Center were recipients of the National Environmental Leadership Award in Asthma Management in 2009 and BPHC later became a cooperative agreement partner to-







Commonwealth of Massachusetts Department of Public Health

Helping People Lead Healthy Lives In Healthy Communities

Environmental Scoring System (ESS) Past, Present and Future

Erica Marshall, MPH

Director – Asthma Prevention and Control Program Massachusetts Department of Public Health Anjali Nath, MPH

Director – Asthma Prevention and Control Program Boston Public Health Commission



With special thanks to

Dr. Jing Guo, PhD, MDPH Asthma Program &

Zhao Dong, MS, ScD, Harvard T.H. Chan School of Public Health



READY Study Specifics

- Principal Investigators
 - Lauren Smith, MD, MPH
 - Cheryl Bartlett, RN, MDPH
 - Jean Zotter, JD, MDPH
 - Megan Sandel, MD, MPH, Boston Medical Center
 - Matthew Sadof, MD, Baystate Medical Center
- Funding
 - American Recovery and Reinvestment Act (ARRA) NIEHS R01 grant (#5R01ES017407-02)
 - HUD Healthy Homes Technical Studies (#MALHH0227-10)
- 4¹/₂ year timeline (October 2009 April 2014)
- Enrollment target: 260 pairs (caregiver and child)

Data Collection

Activity	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Follow up Phone Call
Time	0	0.5	1	2	4-6	8-12
Asthma Control	Х	Х	Х	Х	Х	Х
Asthma Related Health Outcomes	Х				Х	Х
Asthma Caregiver's Quality of Life	Х				Х	Х
Environmental Home Walk Through/Asthma Trigger		X			X	
Parental Expectations		Х			Х	Х
Parental Family Priorities		Х			Х	X 13

READY1 Questionnaire – 2010

Q.#	SECTION 9 - PETS AND PESTS (PP)	RESPONSE
PP1	Do you have any furry or feathered pets, such as dogs, cats, rabbits, birds, hamsters/gerbils/other rodents or others?	PP.1
PP1.a	□1 Yes: Type: 2 No ⇒ Skip to PP2	PP.1.a
А	PP1.a IF YES: Does it come inside?	PP 1 b
PP1.b A	PP1.b IF YES: Does it come inside your child's sleeping room?	FF.1.0
PP2 A	Do you have cockroaches in your home now or in the past 3 months? 1 Yes, within the past month 2 Yes, within the past 3 months but not now 3 No problem within the past three months 99 Don't know	PP2
A	PP.2.a <u>If yes,</u> has anything been done about it?	PP2.a
PP3 A	Do you have a problem with mice or rats in your home now or in the past 3 months? (Specify) 1 Yes, problem within the past month 2 Yes, problem within the past 3 months but not now	PP3
A	Image: Second state of the second	PP3.a

READY Environmental Factors – Pre vs Post



Environmental Scoring System

- Used to assess cumulative trigger burden in a home.
- The Environmental Composite Score is calculated based on both self-report or CHW observation of the following six asthma triggers: dust, mold, pests, smoke, pets, and chemicals in the home.
- Dummy variables (1 = present and 0 = not) are created to indicate whether each trigger is present or not for each family.
- The composite score is then calculated by summing these six dummy variables.
- Range of score is zero to six.

Evolution of Environmental Assessments

	Number of Sections Containing Environmental Trigger Questions	Number of Questions about Environmental Triggers
READY1	5 Trigger-based 4 Room-based CHW walk through	47 self-report 185 walk through
READY2	5 Trigger-based CHW Walk through	21 self-report84 walk through
Reducing Older Adult Asthma Disparities (ROAAD)	4 Trigger-based CHW Walk through	15 self-report (includes 8 on tobacco) 56 walk through

ESS Tool Overview

Environmental Triggers	Questionnaire	Walk-through Assessment (Living room/Child's bedroom/Kitchen/Bathroom)	Decision Rules
Dust	No question from questionnaire used	Level of dust on surface in room: Values: 1 – none 2 – slight 3 – Moderate 4 – Heavy	Exposure to dust (dust = 1), if: Level of dust on surfaces in a room is Moderate or Heavy
Mold	No question from questionnaire used	 Mold/Mildew observed Past 30 days, smelled mold or musty smell in home? Water damage/leaking/drips observed 	Exposure to mold (mold = 1), if Any evidence from walk through for mold/mildew or water leaking/dripping
Pests	 Do you have a problem with mice or rats in your home now or in the past 3 months? Do you have cockroaches in your home now or in the past 3 months? 	Evidence of cockroaches or rodents observed	 Exposure to pests (pests = 1), if 1. Yes, within the past month, or 2. Yes, within the past 3 months but not now, or 3. Any evidence from walk through

ESS Tool Overview

Smoke	 On how many of the past 7 days has anyone, including you, smoked anywhere inside your home? On how many of the past 7 days have you noticed/smelled tobacco smoke that comes from your neighbors' units or other areas in your building anywhere inside your home? 	 Cigarette butts or ashtrays with ash observed Tobacco odor observed 	Exposure to smoke (smoke = 1), if 1. # of days > 0, or, 2. Any evidence from walk through
Pets	Do you have any furry or feathered pets?	NA	Exposure to pets (pets = 1), if 1. Yes, or 2. Types of pets listed
Chemicals	 Do any of the following chemicals in your home have a strong odor that irritates your child's asthma or makes the asthma worse? Cleaning products that contain bleach or ammonia Paint products, solvents, glue Air fresheners, scented candles, incense Pesticides 	Odor observed	 Exposure to chemical (chemical = 1), if 1. If any one specific type has been checked, or, 2. Other odor from walk- through assessment will be based on the text field CHW's filled in. (Do NOT count burning or cooking odors)

READY ESS Pre vs Post

Pre Post



ESS Score

ROAAD Questionnaire – 2015

Q.#	SECTION 8: PETS AND PESTS (PP)
PP1.	Do you have any furry or feathered pets, such as dogs, cats, rabbits, birds, hamsters/gerbils/other rodents or others? □1 Yes: Type: 2 No ⇒Skip to PP2
PP2.	Have you seen evidence of cockroaches in your home now or in the past 3 months? 1 Yes, within the past month 2 Yes, within the past 3 months but not now 3 No problem within the past three months 99 Don't know PP.2.a If yes, has anything been done about it?
PP3.	Have you seen evidence of mice or rats in your home now or in the past 3 months? 1 Yes, problem within the past month 2 Yes, problem within the past 3 months but not now 3 No problem within the past three months 99 Don't know
PP3.a	PP3.a IF YES: has anything been done about it?

ROAAD Interim ESS Pre vs Post



ESS Tool Evaluation Process

- EPA funding awarded to Boston Public Health Commission (BPHC)
- Research Team
 - BPHC
 - Margaret Reid, MPA, RN (PI)
 - Anjali Nath, MPH
 - Ervin Rivera, MPH candidate, Intern
 - MA Dept. of Public Health
 - Erica Marshall, MPH
 - Jing Guo, PhD
 - Sanouri Ursprung, PhD
 - Elizabeth Flood, MPH
 - Harvard T.H. Chan School of Public Health
 - Gary Adamkiewicz, MPH, PhD, Senior Researcher
 - Zhao Dong, MS, ScD, Analyst
 - Marty M. Alvarez, Project Coordinator







Evaluation of ESS by Dong et. al

Objective of analysis.

To determine, "whether ESS would be a good approach for measuring environmental triggers and predicting asthma outcomes across different programs and populations."

Conclusions.

ESS "is a useful tool for measuring home asthma triggers and can be applied regardless of program and survey designs, and that demographics of the target population may influence the improvement in asthma outcomes.

(Am J Public Health. 2018;108:103– 111. doi:10.2105/AJPH.2017.304125)"

Evaluation of the Environmental Scoring System in Multiple Child Asthma Intervention Programs in Boston, Massachusetts

Zhao Dang, MS, ScD, Anjali Nath, MPH, Jing Guo, PhD, Umri Bhannik, MBBS, MS, ScD, May Y. Chin, RN, MS, MBA, Shorry Dong, MPA, Erica Manhall, MPH, Johnna S. Marphy, MPH, Magan T. Sandel, MD, MPH, Sucan J. Sommer, MSN, WHNP-BC, AE-C, W. W. Sanauri Unprung, PhD, Elizabeth R. Woods, MD, MPH, Magaret Reid, RN, MPH, and Gary Adamhirutar, MPH, PhD

the National Institutes of Health recom-

mends the control of environmental fac-

tors as a needed component of asthma

management."

ABOUT THE AUTHORS

Objectives. To test the applicability of the Environmental Scoring System, a quick and simple approach for quantitatively measuring environmental triggers collected during home visits, and to evaluate its contribution to improving asthma outcomes among various child asthma programs.

Methods We pooled and analyzed data from multiple child asthma programs in the Greater Boston Area, Massachusetts, collected in 2011 to 2016, to examine the assoclation of environmental scores (ES) with measures of asthma outcomes and compare the results across programs.

Results. Our analysis showed that demographics were important contributors to variability in asthma outcomes and total ES, and largely explained the differences among programs at baseline. Among all programs in general, we found that asthma outcomes were significantly improved and total ES significantly reduced over visits, with the total Asthma Control Test score negatively associated with total ES.

Conclusions Our study demonstrated that the Environmental Scoring System is a useful tool for measuring home asthma triggers and can be applied regardless of program and survey designs, and that demographics of the target population may influence the improvement in asthma outcomes. (Am JPublic Health, 2018;108:103–111. doi:10.2105/AJPH.2017.304125)

💼 See also Gracy, p. 21.

A thma is the most common chronic discuss among children in the United States, currently afforting about 8.6% of children (agod < 18 years) or most than 6 million children.¹ According to the Centern for Discus Control and Prevention, Massachus etti has the highest current asthma provalence in adults of all states in the United States.² It is also among the highest in percentum of children with unconstruited usform There are significant dispatities in asthma bardens among demographic and socioeconomic groups. Higher asthma provalence is commonly found in minotity groups such as Black or Hipanics, and in populations with lower socioeconomic status.⁷ In addition, Black and Hipanics children tend to have more seven asthma and lower utilization of preventive medication thats White children, even after adjustment for socioeconomic status.⁸ However, there is evidence that asthma dispatisies can be substantially reduced by comprehensive care, both through the health care system and through home-based intervention programs.⁸

Numerous asthma intervention programs have been developed throughout the United States based on clinical and environmental intervention studies. Many of these programs have been shown to improve asthma cutcomes in children,¹⁰ especially these conducted by community health workers and focasing on home-based interventions.³¹⁻¹³ How ever, studies to date have mostly focase do on clinical outcomes, where a few have examined these programs in practice¹⁴ or

Zhen Dong and Gary Administrator were with the Department of Basironmontal Health, Harvard T. H. Chen School of Pakit Health, Basin, McL. Anjeli Nakis is adde the Derivien of Healthy Hanox and Community Suppress, Community Solidation Basers, Basers Pakits: Health Commission J Inf. Gain works for Arthun Proceeding and Consol Program, Manachurers: Department of Pakits: Health, Basers, Linn Baserskie werdt for Derivien of Addresser(Yang Address

AJPH RESEARCH

Value of the ESS Tool Evaluation

Boston Asthma Home Visit Collaborative (BAHVC)

- BPHC has convened the BAHVC since 2011 with support from the EPA.
 - 5 Asthma Home Visit Programs
 - Trained CHWs
 - Standardized home visit questionnaire and protocols (revisions)
 - Collect monthly data
 - Serve in multiple languages













Value of the ESS Tool Evaluation

Opportunities

- ✓ Analyze BAHVC data for the first time
- ✓ Assess impact of our services
 - Decrease in triggers
 - Improved asthma outcomes
- ✓ Possibility of validation/standardization of tool
- ✓ Potential for national use

ESS Tool Evaluation Process

- **Pooled 6 data sets** from 4 existing asthma home visiting programs in Boston area from 2011 to 2016.
- Assigned an Environmental Score using the methodology developed by Dr. Guo described previously looking at the 6 trigger areas: mold, pet, pest, smoke, dust, and chemical exposures.
- Looked at changes in ES over the course of the interventions relative to ACT scores and ED visits.

Findings

Findings

Evaluation of ESS by Dong, et. al

<u>Results</u>: Generally, total asthma outcomes were significantly improved and total ES significantly reduced over visits, across various programs.

<u>Conclusions</u>: The ESS tool appeared to be implementable across program, showing consistent trends regardless of program and survey designs. Demographics of target population/clients does impact improvement in asthma outcomes.

<u>Implications</u>: Given the practical difficulty to standardize survey designs and other elements among programs, ESS would be a useful tool that may be applied broadly to different programs in the future.

Using the ESS Tool

Resources

- Read the AJPH Study: Evaluation of the Environmental Scoring System in Multiple Child Asthma Intervention Programs in Boston, Massachusetts.
- ✓ Download ESS Tool from AsthmaCommunityNetwork.org.
- ✓ Request BPHC Questionnaire and DPH's READY Questionnaire.

Data Recommendations

- Practice strong/consistent data collection and management within and across programs.
- Track specific dates and changes made to your program tools and practices to support data analysis.

Limitations & Potential of the ESS

- ESS was not developed to be a validated or universal tool, but it has the potential to be successfully used that way.
- Blunt instrument, but potential to be refined.
 - Does not capture variability of trigger levels
 - Does not capture fluctuations of triggers (e.g., some eliminated, others emerge) over course of intervention

Next Steps for the ESS

Validation

- Evaluate ESS's construct validity
- Contrast ESS scores calculated using participants self-report only with scores calculated based on the CHWs' assessment only
- Examine internal consistency of reliability

Correlation

- Explore what, if any, correlation exists between environmental triggers and asthma and exacerbations or increased symptoms and the effectiveness of environmental triggers reduction in reducing exacerbations
- Potential for validation using national data

Practical Application of the ESS











Pets	Do you have any furry or feathered pets?	NA	Exposure to pets (pets = 1), if 1. Yes, or 2. Types of pets listed
			••••••

ESS Score = 1



Mold No question from Exposure to mold (mold = 1), if 1. Mold/Mildew questionnaire used observed Past 30 days, smelled 2. Any evidence from walk through mold or musty smell for mold/mildew or water in home? leaking/dripping 3. Water damage/leaking/drips observed

Cumulative ESS Score = 2



Chemicals	 Do any of the following chemicals in your home have a strong odor that irritates your child's asthma or makes the asthma worse? Cleaning products that contain bleach or ammonia Paint products, solvents, glue Air fresheners, scented candles, incense Pesticides 	Odor observed	 Exposure to chemical (chemical = 1), if 1. If any one specific type has been checked, or, 2. Other odor from walk- through assessment will be based on the text field CHW's filled in. (Do NOT count burning or cooking odors)
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Cumulative ESS Score = 3

For more information

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Department of Global Health and Population

Polling Question 3

Based on what you have learned today, which action are you most likely to pursue?

- 1. Learn more about the Environmental Scoring System by accessing resources on AsthmaCommunityNetwork.org
- 2. Find out more about using data to quantitatively assess asthma triggers
- 3. Share the Environmental Scoring System with my partner organizations and consider adopting in my program
- 4. Explore incorporating environmental trigger remediation into my in-home asthma education program
- 5. Other



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