

The System at Work: Tailored Environmental Interventions

Q5

Question: Which of these areas do I feel most prepared to champion in my program?

1. Leveraging community assets
2. Integrated health care services
3. Tailored environmental interventions
4. Evaluation
5. Creating conversations of opportunity

NATIONAL ASTHMA FORUM

Communities in Action for Asthma-Friendly Environments

Q6

Question: Which of these areas do I feel ready to take action on and want to learn more about?

1. Leveraging community assets
2. Integrated health care services
3. Tailored environmental interventions
4. Evaluation
5. Creating conversations of opportunity

NATIONAL ASTHMA FORUM

Communities in Action for Asthma-Friendly Environments



Communities in Action

V. CHANGE CONCEPT – TAILOR ENVIRONMENTAL INTERVENTIONS TO THE INDIVIDUAL, THE SETTING AND THE COMMUNITY

Customize environmental interventions to meet individual health and education needs; provide counseling and tools to manage environmental triggers in all of the environments where patients spend time.

Strategies for Action:


- Educate clinical care teams and individual patients on environmental asthma triggers
- Assess patients for allergies and triggers and provide *tailored* environmental education and counseling during the clinical visit
- Provide tools and training to manage environmental asthma triggers at home, at school, at work, and in the outdoor environment

NATIONAL ASTHMA FORUM Communities in Action for Asthma-Friendly Environments

The Effectiveness of Tailored Asthma Interventions: NIAID Inner-City Asthma Studies


EPA National Asthma Forum

June 3, 2009



NCCAS

Herman E. Mitchell, PhD
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ICAS

NIAID Inner City Asthma Studies



- National Cooperative Inner City Asthma Study (NCICAS)
 - 1990 - 1997
- Inner City Asthma Study (ICAS)
 - 1996 - 2004
- Inner City Asthma Consortium (ICAC)
 - 2003 - 2010



Generalized vs Individualized



- Both general and individualized interventions can be effective
- General interventions have limited effectiveness
- Need to be combined with individualized treatment or intervention

Generalized Interventions



- General public health warnings, e.g., HIV awareness, smoking, obesity
- Disease specific interventions often are based upon general disease risks
- Medications and treatment based upon the “typical” person

Individualized Interventions



- Physician-patient interaction
- Case management
- Patient specific medications
- Interventions tailored to patient specific risks

Traditional Asthma Interventions



- Asthma interventions, as most interventions, are typically general in nature
- Interventions focus on the disease and the factors related to that disease
- Often a **one-size-fits-all** approach

Asthma Interventions



General

- General in nature
- Focused on the disease
- Everyone gets the same intervention

Tailored

- Specific to the child
- Disease X Child Interaction
- The intervention is customized to the specific circumstance or risks

Individualizing Asthma Interventions



NCICAS

Asthma Counselor Intervention

National Cooperative Inner-City Asthma Study



NCICAS Phase I Epidemiologic Study



Broad epidemiologic study of 1528 children
with asthma in 8 major urban areas

Results:

Asthma a multifaceted problem

No “silver bullet”

Among the Risk Factors Found to Affect Asthma...



- **Medical Risk** – continuity of care, ED use, communication with PCP
- **Adherence** – correct medication use, barriers to adherence
- **Asthma Responsibility** – shared, diffused responsibility
- **Psychosocial Factors** – caretaker and child psychological status
- **Attitudes** – ability to control symptoms, attitude toward health care, medications
- **Allergies and exposures** – skin test sensitivities, environmental triggers, ETS exposure

NCICAS Phase 2 Intervention Study



- **Phase 2 – Intervention Study**
 - Purpose was to intervene on the factors identified in the Phase 1 epidemiology study
 - 1033 Children at 8 Research Centers randomized to a tailored Asthma Counselor intervention or control condition

NCICAS: Intervention



- Asthma Counselors regular meetings with families to address the multitude of risk factors identified in Phase I
- Intervention was tailored to each families individual risks based upon an extensive baseline assessment
- CARAT – Child Asthma Risk Assessment Tool

Purpose of the CARAT



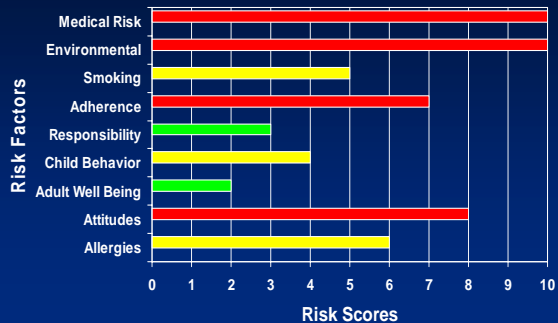
1. Identify individual asthma risks
2. Provide summary of the risks
3. Guide initial conversations
4. Personalize asthma education
5. Guide intervention activities

Among the Risk Factors Found to Affect Asthma...



- **Medical Risk** – continuity of care, ED use, communication with PCP
- **Adherence** – correct medication use, barriers to adherence
- **Asthma Responsibility** – shared, diffused responsibility
- **Psychosocial Factors** – caretaker and child psychological status
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Child Asthma Risk Assessment Tool



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Individualizing Asthma Interventions



ICAS

Environmental Counselor Intervention

Inner-City Asthma Study

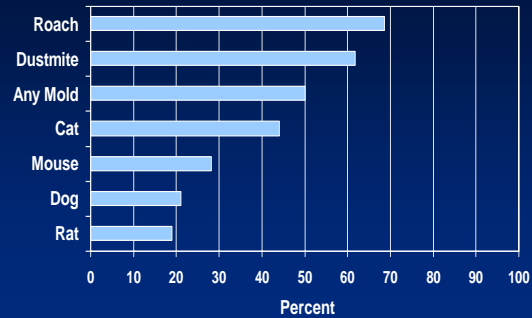


ICAS: Study Population



- 937 children aged 5 to 12 with moderate asthma enrolled from inner-city census tracts
- Severity in last 6 months:
 - One overnight hospitalization for asthma
 - or -
 - Two unscheduled clinic visits for asthma
- Positive skin test to ≥ 1 indoor allergen
- Sleep at one address ≥ 5 nights per week

Allergen Sensitivity by Skin Prick Test



Home Environmental Exposures



Tobacco smoking (≥ 1 smoker)	47%
Dampness, water leaks, mildew	70%
Cockroaches	73%
Rodents	49%
Furry pet	30%

Environmental Intervention



- Modules presented by an environmental counselor during 5 - 7 home visits over 12 months
- Modules included:
 - Education
 - Demonstration of remediation activities
 - Provision of supplies, equipment, and services
- Dust mite and ETS: All subjects
- Other allergens: Based on allergy testing and home environment assessment

ICAS Modules



<u>Module</u>	<u>% Assigned Module by ERAT</u>	<u>% Completing Module</u>
Safe Sleeping Zone	100.0	98.1
ETS	100.0	95.3
Cockroach	67.6	98.1
Rodent	33.5	94.9
Pets	47.8	96.9
Mold	51.2	94.7

Tailoring ICAS Modules



Modules Delivered

<u>per Household</u>	<u>%</u>
Zero	1.7
One	1.5
Two	4.9
Three	31.8
Four	29.9
Five	19.2
Six	11.1

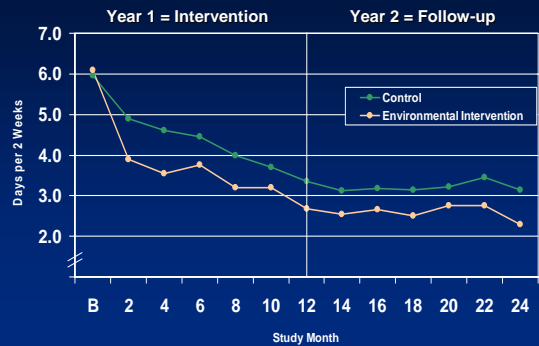
Mean length in minutes of each visit (\pm SD) 73.6 (\pm 27.59)
Mean number of visits per household (\pm SD) 4.7 (\pm 1.09)

Outcome Monitoring

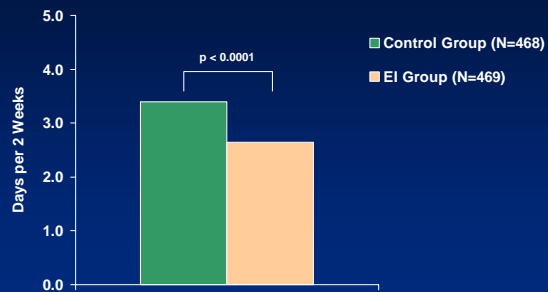


- Phone calls every 2 months by a centralized telephone interviewer system
 - 2-week recall for asthma medications and morbidity including symptoms, missed school, and impact of child's asthma on caretaker
 - 2-month recall for healthcare utilization
 - Home environmental evaluation including allergen measurement every 6 months

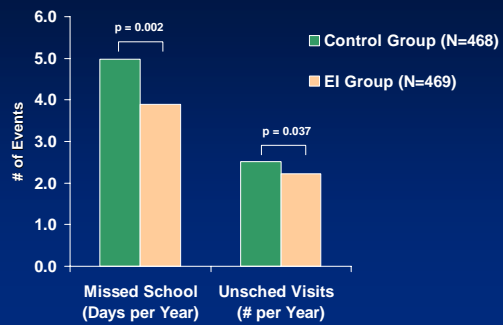
Maximum Symptom Days

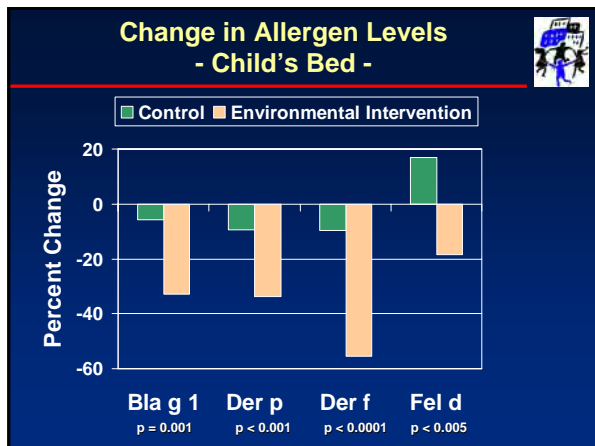


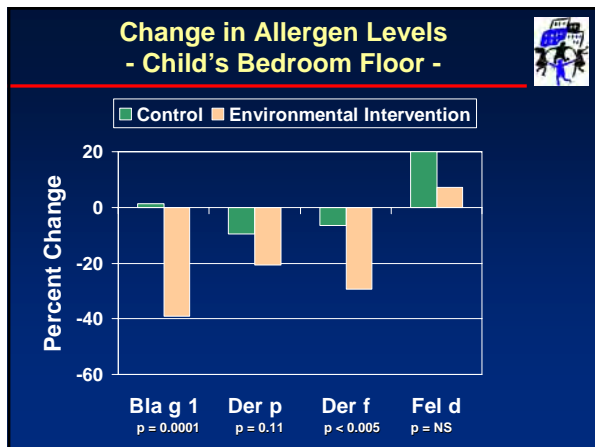
Environmental Intervention Outcomes - Days with Wheeze or Cough -

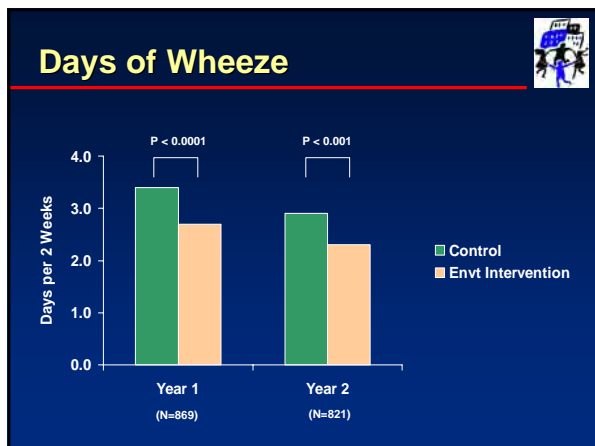


Environmental Intervention Outcomes

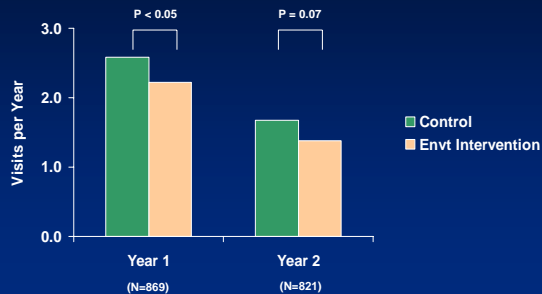








Unscheduled Asthma Visits (Clinic or Emergency Department)



Environmental Intervention - Conclusions -



The EI had a beneficial impact on subject health and healthcare utilization

- 22% reduction in days with wheeze leading to 20 more days per year without wheeze
- 22% decrease in missed school days
- 12% reduction in unscheduled visits

ICAS Conclusions

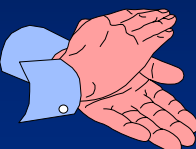



- A one-year environmental remediation strategy resulted in sustained reductions in indoor allergen levels and improvements in asthma morbidity
- Improvements in asthma morbidity were significantly correlated with reductions in bedroom allergen exposure
- Home-based environmental remediation programs offer an effective means of reducing asthma morbidity in children living in an inner-city environment

Acknowledgements

ICAS subjects and their families

ICAS research teams







Home-Based Environmental Interventions to Reduce Asthma Morbidity

The Community Guide Asthma Review

2009 National Asthma Forum


June 4-5, 2009

Deidre Crocker| David Hopkins| Stella Kinyota| Gema Dumitru
Collin Ligon| Briana Lawrence| Theresa Sipe



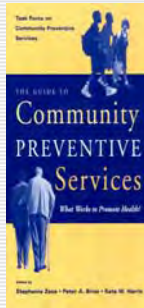
Disclaimer

The findings and conclusions in this presentation should not be construed to represent any Task Force on Community Preventive Services or CDC determination or policy.



The Community Guide

- Established in 1996; at CDC
- Directed by the Task Force on Community Preventive Services
- Conducts rigorous systematic reviews of evidence for community interventions
- Makes recommendations for use of public health interventions
- <http://www.thecommunityguide.org>



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Coordination Team

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Colin Ligon.....	APRHB	External Partners	
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Why Asthma?



>20 million Americans



\$37.2 billion/yr



1.8 million ED visits



~500,000
Hospitalizations



4.7 million office visits



~14 million missed
school days

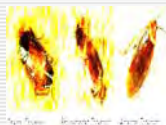


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Why Home-Based Asthma Interventions?



Dust Mites



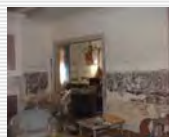
Cockroach Allergens



Rodents



Pet Dander



Mold



Cigarette Smoke



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Goal of This Review

To systematically review the effectiveness of multicomponent, multi-trigger home-based environmental interventions in improving asthma morbidity.



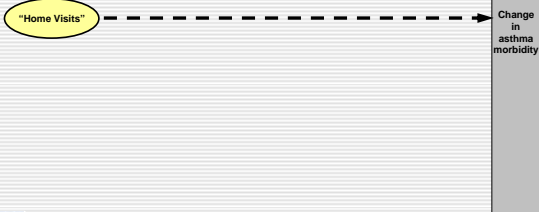
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Analytic Framework



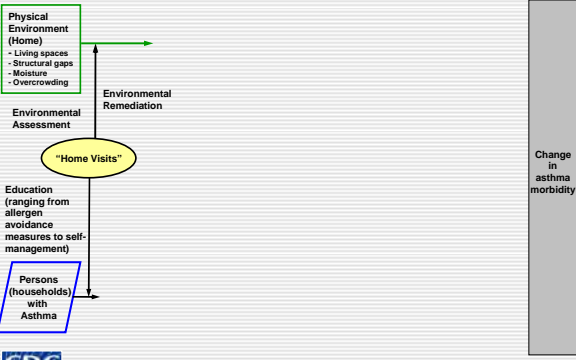
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Home-Based Environmental Interventions

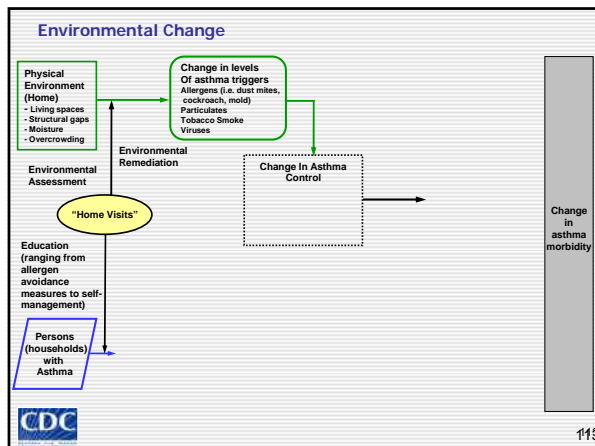


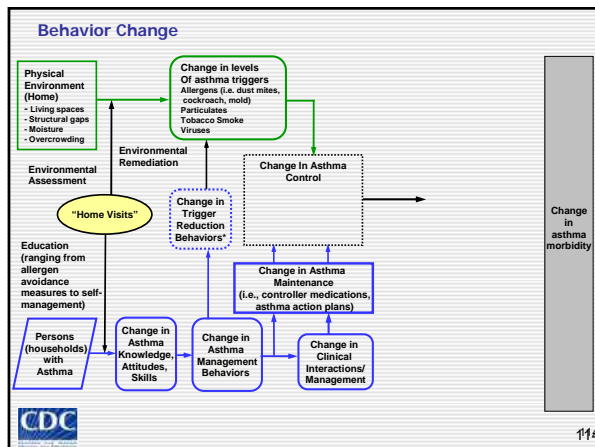
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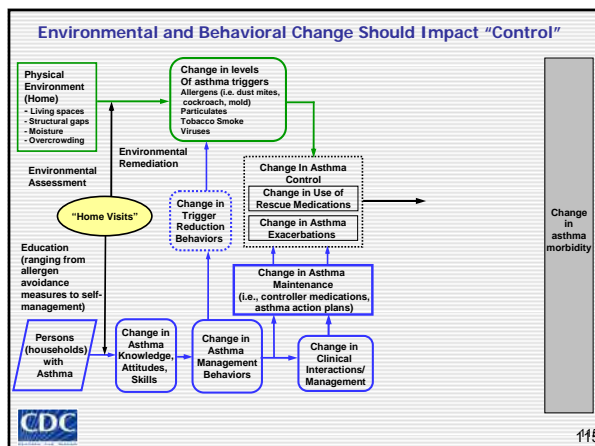
Two Major Pathways: Environmental and Behavioral Change

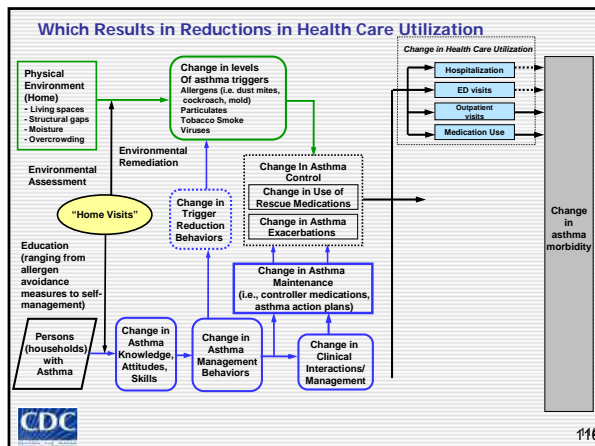


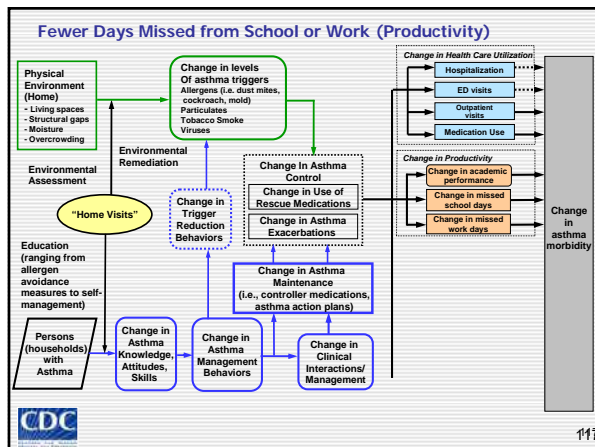
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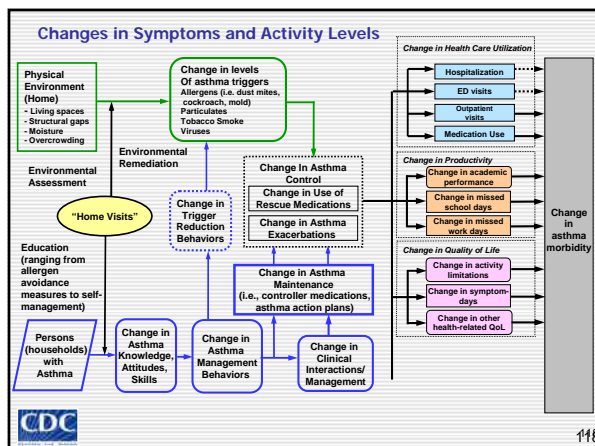


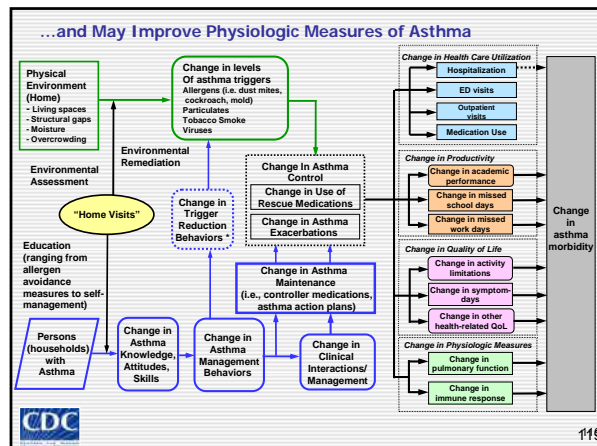








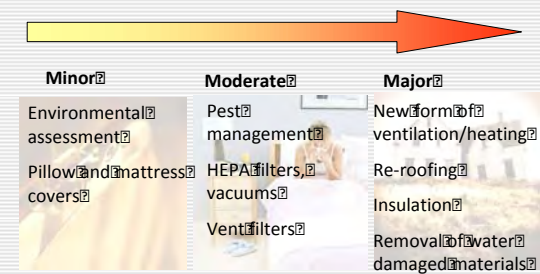


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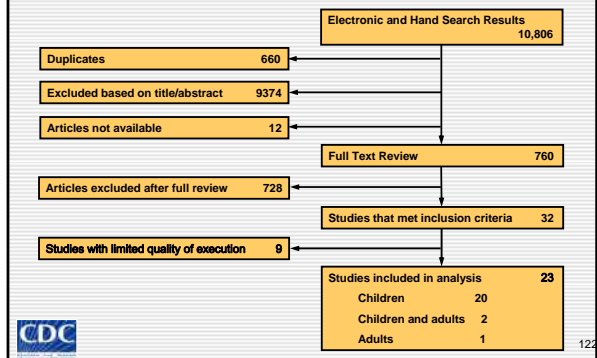
Intervention Criteria

- Home visit
- Multi-component
 - ◆ ≥ 1 component towards home environment
 - Environmental assessment
 - Environmental remediation
 - Environmental education
 - ◆ +/- Efforts to improve asthma management behaviors
 - Self-management, social services, coordinated care
- Multi-trigger
 - Environmental component addresses two or more potential asthma triggers

Environmental Remediation Intensity



Search Results: 1966–February 2008



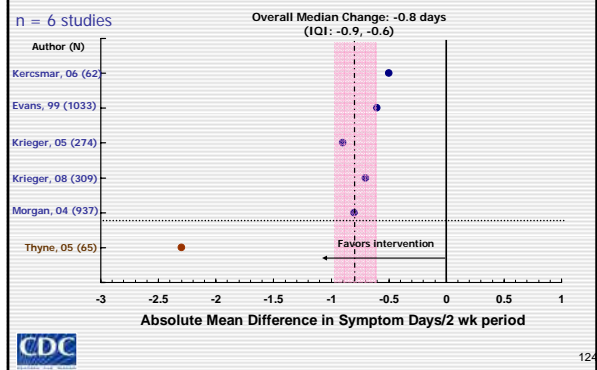
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Study Results: Children

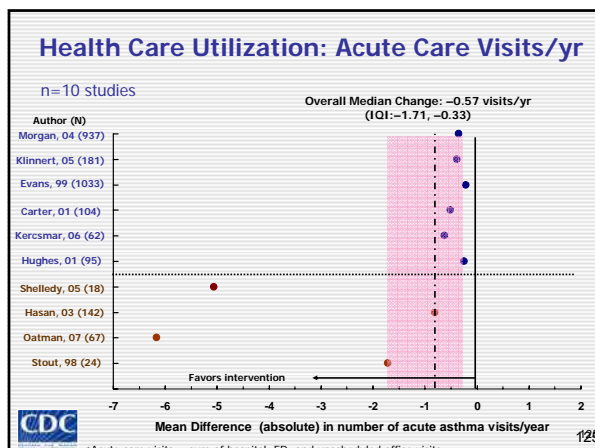


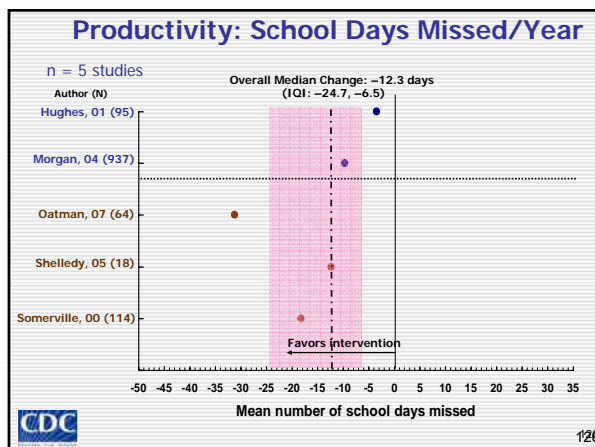
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Quality of Life: Symptom Days



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Physiologic Outcomes

(n = 7 studies)

- All RCTs
- All with different measurements
- Overall, no significant improvement in pulmonary function

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Summary: Outcomes in Children

- Quality of Life
 - ♦ Asthma symptom days reduced by 21 days/year
- Health care utilization
 - ♦ Acute care visits reduced by 0.6 visits/year
- Productivity
 - ♦ School days missed due to asthma reduced by 12.3 days/year
- Physiologic
 - ♦ Overall, no significant improvement in pulmonary function



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Summary Outcomes: Adults

Outcome	No. of Studies	Findings
Quality of Life	2	Improvement in QoL scores
Health Care Utilization	1	Reduction in acute care visits
Productivity	1	No improvement
Physiology	0	Not Reported



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Task Force Recommendation Children and Adolescents

The Task Force recommends the use of home-based multicomponent, multi-trigger environmental interventions for **children and adolescents** with asthma on the basis of strong evidence of effectiveness in reducing symptom days, improving quality of life or symptom scores, and reducing the number of school days missed.



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Task Force Recommendation Adults

The Task Force found insufficient evidence to determine the effectiveness of home-based multicomponent, multi-trigger environmental interventions in **adults** with asthma due to a small number of studies with inconsistent results.



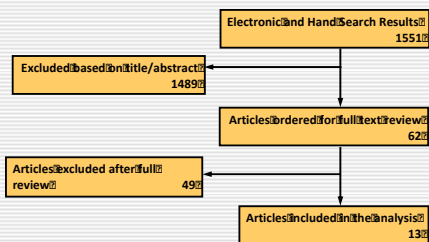
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Economic Review

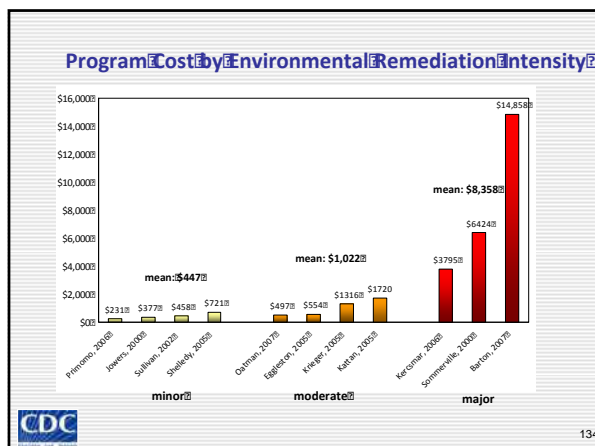


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Economic Evaluation Search Results (1950–June 2008)



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Economic Findings

- Program costs: \$231 to \$1,720 per participant (12 studies)
- Benefit-cost ratio ranging from 5.3 to 24.0 (3 studies)
- Cost-Effectiveness ranging from \$12 to \$57 per QALY (3 studies)

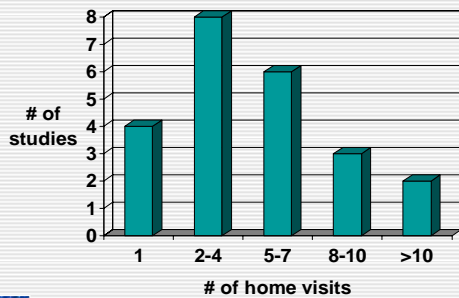
Based on this evidence, the Task Force found that home interventions with the combination of minor to moderate environmental remediation with an educational component provides good value for the money invested.

CDC

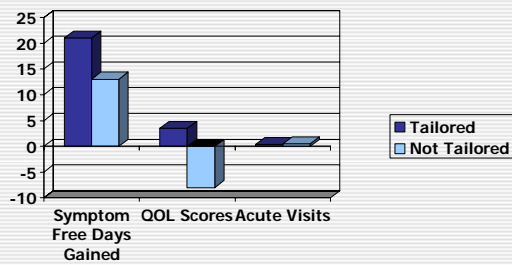
Additional Findings

CDC

Number of Home Visits



Impact of Tailoring



Additional Benefits of These Interventions

- Improved caregiver support
- Caregiver smoking cessation
- Health benefits for parents and siblings of study children
- Identifies additional public health concerns in the home



Challenges/Barriers to Implementation

- Expense of interventions to participant
 - Major remediation
- Inability to maintain follow up
- Sustainability
- Personnel to conduct home visits
- Acceptability of home visit
 - privacy issues



CDC insurance issues

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How to Use Recommendations

- Funding
 - Site as Evidence of Effectiveness and Cost Effectiveness
- Insurance
- Communication/translation
- Policy Development



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Take Home Points

Home-based multi-trigger, multi-component, environmental interventions are

- 1) **Effective** in reducing symptom days, school days missed, and acute asthma visits
- 2) **Good value** for the money invested for programs with minor or moderate environmental remediation
- 3) **Tailoring** intervention towards environmental exposure and client sensitivity may improve effectiveness and reduce cost



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Additional Resources

- Community Guide Asthma Recommendation
<http://www.thecommunityguide.org/asthma/multicomponent.html>
- Air Pollution and Respiratory Health Branch
<http://www.cdc.gov/asthma>



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Questions

Thank you!



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Question: Does your program have a home environmental intervention component?

1. Don't have it
2. Under development
3. In place, adequate
4. Very well developed, a model for others
5. N/A

Q7

Breaking-In

- Megan Sandel and Margaret Reid,
Boston Medical Center and BPHC
- Dr. Tyra Bryant-Stevens, Children's
Hospital of Philadelphia
