

# Investing in Best Practices for Asthma: A BUSINESS CASE

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Health Resources in Action  
Advancing Public Health and Medical Research





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Factors Associated with Asthma in Indoor Environments	
Common Allergens	Common Irritants
<ul style="list-style-type: none"> <li>Cockroaches</li> <li>Mice/Rats</li> <li>Mold/mildew</li> <li>Dust mites</li> <li>Household pets</li> <li>Outdoor allergens</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning chemicals</li> <li>Sprays/scents</li> <li>Environmental tobacco smoke</li> <li>Indoor/outdoor fumes (gas/wood burning stoves, diesel engines)</li> </ul>

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## What is Integrated Pest Management?

Integrated Pest Management (IPM) is a prevention-based approach to controlling cockroaches, rodents and other pests known to trigger and/or initiate asthma. IPM represents a safe and effective method for reducing pest allergen levels in homes, which in turn may reduce asthma symptoms. Relative to standard clinical approaches to asthma management, IPM education, services and basic supplies are cost-effective. For certain high-risk patients, professional pest management services are justified. For others, use of basic IPM supplies—without professional services—can cost-effectively reduce allergen levels and improve symptoms. For more details on the business case for investing in IPM, see a report for the Boston Public Health Commission, prepared by the Asthma Regional Council of New England, “The Role of Pest Control in Effective Asthma Management: A Business Case” By Brett and Stillman. Available at:

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## Home-Based Environmental Interventions – Spectrum of Intensity

### Examples of Interventions

Minor	Moderate	Major
<ul style="list-style-type: none"> <li>• Environmental assessment</li> <li>• Pillow &amp; mattress covers</li> </ul>	<ul style="list-style-type: none"> <li>• IPM supplies and services</li> <li>• Cleaning kits</li> <li>• HEPA furnace filters, vacuums, &amp; air purifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Ventilation/heating retrofits</li> <li>• Re-roofing</li> <li>• Insulation</li> <li>• Removal of water damaged materials</li> </ul>

The effectiveness of home-based multi-trigger, multi-component environmental interventions, tailored to the individual, has been established by rigorous research. Examples of home-based environmental interventions above are arrayed along a spectrum of intensity as categorized by the CDC Task Force in their review of 12 studies that have evaluated costs. This figure is one model of the spectrum of intensity of interventions. Programs group interventions in a variety of ways, and some include additional components, such as professional services for carpet removal. Gaps in knowledge still remain about the independent contributions of particular components to the overall effectiveness of a multi-faceted intervention.

Sources: (1) Nurmagambetov T, et al. Economic Evaluation of Home-Based Environmental Interventions to Reduce Asthma Morbidity. CDC presentation on EPA Communities in Action for Asthma Friendly Environment, Economic Evaluation of Home-based Environmental Interventions webinar. December 2, 2009. (2) CDC Task Force on Community Preventive Services. "Asthma Control: Home-based Multi-trigger, Multicomponent Environmental Interventions Summary Evidence Tables – Economic Review." Available at: <http://www.thecommunityguide.org/asthma/supportingmaterials/SETEcon.pdf>. Accessed March 30, 2010.

The Inner City Asthma Study demonstrated that a moderate intensity home-based environmental intervention program for high-risk children, delivered by an environmental counselor over the course of 5 visits, cost \$28 for each symptom-free day gained (total program costs \$1469/person.)\* These expenditures are well within the range of what payers have determined are "reasonable" costs for medications that achieve similar health outcomes, and far less than Xolair (omalizumab), which costs \$523 per symptom-free day for patients with moderate-severe, uncontrolled allergic asthma.\*\*

Sources: \*Kattan M, et al. "Cost Effectiveness of a Home-based Environmental Intervention for Inner-city Children with Asthma," Journal of Allergy and Clinical Immunology. 2005; 116(5):1058-1063. \*\*Oba Y and Slazman GA. "Cost-effectiveness Analysis of Omalizumab in Adults and Adolescents with Moderate-to-Severe Allergic Asthma," Journal of Allergy and Clinical Immunology. 2004; 114(2): 265-269.





## Patient Intervention Stratification Model

The diagram shows a pyramid divided into two sections. The top section is dark gray and labeled 'Higher Risk'. The bottom section is light gray and labeled 'Lower Risk'. Lines connect each section to a corresponding box of criteria on the right.

**Higher Risk**

Patient Characteristics:  
Asthma Diagnosis, plus:

- 1 or more ED visit, hospitalization or unscheduled physician visit in 6 months;
- >3 rescue medications in 6 months;
- activity limitations;
- classified as moderate or severe persistent

Intervention: Moderate Intensity (see Figure 6)

**Lower Risk**

Patient Characteristics:  
Asthma Diagnosis, plus:

- no ED visits or hospitalizations;
- few activity limitations;
- classified as mild severity

Intervention: Low Intensity (see Figure 6)

## The Value of Community Health Workers

Community Health Workers (CHWs), or community health advocates and educators who make home visits, can be important members of an asthma team. Not only are CHWs effective, they also cost less than nurses, medical social workers, or respiratory therapists. The recent results from the Seattle-King County Healthy Homes II Project add to the body of evidence regarding the value of using CHWs to deliver home-based environmental intervention programs for asthma as well as to complement clinic-based asthma education programs during the home visit.\* CHWs also serve as important clinic liaisons to enhance patient access to health professionals.\* Though providers with more training may be needed in certain situations, CHWs have emerged as effective providers of basic health interventions in many cases because of their ability to bridge the gap between community members and health institutions, often due in part to shared cultural backgrounds with program participants. Randomized controlled trials have consistently shown that when appropriately trained and supervised, CHWs can provide home visits for education and environmental allergen reduction that result in positive health outcomes, including fewer asthma symptoms, daytime activity limitations, and emergency and urgent care visits.\*\*

Sources: \*Krieger J, et al. "A Randomized Controlled Trial of Asthma Self-Management Support Comparing Clinic-Based Nurses and In-Home Community Health Workers," Archives of Pediatric and Adolescent Medicine. 2009;163(2):141-149. \*\*Postma J, et al. "Community Health Workers and Environmental Interventions for Children with Asthma: A Systematic Review," Journal of Asthma. 2009;46:564-576.

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LOW INTENSITY FOR LOWER RISK PATIENTS			MODERATE INTENSITY FOR HIGHER RISK PATIENTS*		
<p><b>SETTING</b> Group or Individual; Clinic or Phone-Based (1+ visits)</p> <p><b>STAFFING</b> Examples include: Certified Asthma Educator, Registered Nurse, Mid-level Practitioner, Respiratory Therapist, Licensed Clinical Social Worker, Chronic Disease Educator or others well-trained in asthma care and education.</p>			<p><b>SETTING</b> Individual; Home-Based (1-5 visits)</p> <p><b>STAFFING</b> Same as for lower risk patients, however the home environmental intervention can be conducted by a Community Health Worker or Environmental Counselor.</p>		
<p><b>EDUCATION</b> Address asthma physiology; medical self-management (use of Asthma Action Plan; &amp; control of environmental triggers)</p>	<p><b>SERVICES</b> Smoking cessation; referrals to other specialists, programs &amp; resources</p>	<p><b>SUPPLIES</b> Peak flow meters; spacers; mattress/pillow covers</p>	<p><b>EDUCATION</b> Same as low intensity</p>	<p><b>SERVICES</b> Same as low intensity as well as case management; in-home environmental assessment; professional IPM or cleaning services if indicated</p>	<p><b>SUPPLIES</b> Same as low intensity and other environmental trigger reduction supplies as needed (e.g. basic IPM supplies, HEPA vacuums, air filtration)</p>

\*Some patients may benefit from higher intensity interventions not listed here. These include significant structural remediation (e.g. repairing significant leaks, carpet removal, new ventilation systems, removal of water damaged material). While these interventions effectively reduce exposure to environmental triggers associated with asthma, there is not evidence of cost-effectiveness when they are compared to standard asthma interventions/treatments. However, such services should be considered in exceptional circumstances where asthma remains out of control despite adherence to medication and provision of environmental trigger supplies and services.

Diagram illustrating the conversion of a 32-bit integer to a 64-bit integer. The top row shows a 32-bit integer with the first 16 bits in blue and the last 16 bits in red. The bottom row shows a 64-bit integer where the first 16 bits are blue, the next 16 bits are red, and the last 32 bits are green. The conversion is done by shifting the original 32-bit value left by 32 bits and OR-ing it with the original value.

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## Expanding Your Health Plan's Asthma Management Program: Three Steps to Get Started

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2. Leverage the capacity of community partners to provide additional asthma management services. Community-based organizations, health departments, hospitals, and visiting nurse associations, among others, have the capacity to work in partnership to provide additional services to your members. Leverage these organizations' capacities to expand the asthma management services for your members, and jointly establish rigorous mechanisms for accountability and quality improvement.
3. Become a model: track your effectiveness. Before the program begins, calculate baseline rates and have a plan in place to monitor key outcome measures, including cost effectiveness. Be sure to publish and share the news of your program's successes and lessons learned.

An excellent guide for health plans that are interested in developing a home visiting program is the U.S. EPA's Implementing an Asthma Home Visiting Program: 10 Steps to Help Health Plans Get Started. See:

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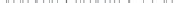
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