

# Managing Asthma Through Home Visits:

Empowering Individuals to Create  
Healthy Home Environments







# In-Home Asthma Care: Putting the Pieces Together

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Approximately 7 million U.S. children ages 0 to 17 have asthma, with poor and minority children suffering a greater burden of the disease. The prevalence of current asthma in the United States is 16 percent among non-Hispanic black children, 10.7 percent among American Indian and Alaska Native children, and 8.2 percent among non-Hispanic white children.<sup>1</sup> Asthma persists into adulthood, and the costs to society are high: The annual economic cost of asthma, including direct medical costs from hospital stays and indirect costs (such as lost school and work days), amounts to more than \$56 billion annually.

Although we do not yet have interventions to prevent the onset of asthma, we do have a clear understanding of how to prevent asthma morbidity and improve the control of asthma and the quality of life of individuals who have the disease. The National Asthma Education and Prevention Program Guidelines for the Diagnosis and Management of Asthma<sup>2</sup> establish that effective asthma care must be comprehensive and include four key components: pharmacologic treatment, education to improve self-management skills of the patient and their family, reduction of environmental exposures that worsen asthma, and monitoring of the level of asthma control to adjust a patient's management plan accordingly.

To treat asthma properly, conditions in the home environment must be addressed. Asthma home visits provide an ideal setting to educate, review medication plans, and help families to identify environmental factors in their homes that may contribute to the severity of asthma. Additionally, evidence shows that reducing asthma triggers in the home can significantly improve the health outcomes of people with asthma and also reduce the high cost of repetitive emergency and in-patient care.

## Key Components of Asthma Home Visits<sup>3</sup>

Home visits provide an opportunity to educate people with asthma and help them effectively manage their disease. The primary purpose of a home visit is to identify and mitigate the effects of exposure to environmental triggers in the home. Visiting a family's home can be very effective because more information can be learned from, and given to, a person face-to-face at home than over the telephone or in a doctor's office. At the same time, the in-home service provider can use the visit to assess the indoor environment where a person spends much of the day and evaluate first-hand the sources of triggers and potential pathways that may lead to asthma flare-ups. Home environmental assessment for asthma triggers has the potential to improve an individual's and the family's understanding and skills to manage asthma effectively. In addition, primary care providers can use the results of the environmental assessment to understand the context of exposure better and tailor treatment accordingly.

The Community Preventive Services Task Force,<sup>4</sup> an independent, nonfederal, uncompensated body of public health and prevention experts, conducted a systematic review evaluating the evidence on the effectiveness of home-based, multi-trigger, multi-component interventions with an environmental focus to improve asthma-related morbidity outcomes. The "Community Guide,"<sup>5</sup> which summarizes the Task Force's findings, identifies three core components for effective interventions.



## A Closer Look at Environmental Remediation<sup>6</sup>

Environmental remediation is the set of actions conducted or financed to reduce triggers in the home. The range of environmental remediation actions included in asthma home visits can vary considerably in cost, effort and materials. The Community Guide categorizes the in-home environmental remediation spectrum of intensity as minor, moderate or major. Evidence indicates that moderate remediations result in fewer symptom-days and improved quality of life when compared to the other two types of remediations. Because very few studies evaluate major remediation, it is difficult to compare the effectiveness of the various levels of environmental remediations. Studies of major remediation efforts showed effectiveness in several outcomes, but they did not clearly show a greater effect than interventions conducting moderate and minor remediation. Ultimately, the Task Force uses the evidence of effectiveness in improving overall quality of life and productivity to recommend home-based multi-trigger, multi-component interventions with an environmental focus for children and adolescents with asthma.

## Programs in Action

An example of a remediation program is the 2008 winner of the National Environmental Leadership Award (NELA) in Asthma Management,<sup>7</sup> the Asthma Network of West Michigan (ANWM),<sup>8</sup> which provides intensive home-based case management to low-income children and adults with moderate to severe asthma. During the 12 months of home visits, certified asthma

### **Minor Remediation:**

*Facilitating minor changes to the home. Activities in this category at a minimum include providing advice on recommended environmental changes to be made by members of the household and may include providing low-cost items such as **allergen-impermeable mattress and pillow covers**.*

educators—who are either respiratory therapists or registered nurses—perform environmental assessments and educate patients and caregivers about asthma management practices, including trigger avoidance. They also work with the patient’s health care providers and provide referrals for counseling, financial assistance and access to other social services.

ANWM has provided home-based case management services to Priority Health’s Medicaid pediatric population on a fee-for-service basis. Priority Health has extended its partnership to include select commercial patients as well as adults with asthma. In addition to Priority Health, ANWM has contracts with four other health plans, and reimbursement by the plans represents one-third of the budget for the program, with the goal of working toward one-half of the budget. The program uses the Medicaid Revenue (Billing) Code 551, “Skilled Nursing Visit for RN, RRT or LMSW,” for reimbursement.

One of the 2014 NELA in Asthma Management winners, the Multnomah County Health Department,<sup>9</sup> provides an example of a moderate environmental remediation program. A multidisciplinary team, including a case manager (registered nurse, registered environmental

### **Moderate Remediation:**

*Providing multiple low-cost materials with the active involvement of the trained home visitor(s). Activities in this category may include providing and fitting mattress and pillows with allergen-impermeable covers, installing small air filters and **dehumidifiers, integrated pest management**, professional cleaning services or equipment, and minor repairs for structural integrity.*

health specialist or certified asthma educator) and a certified community health worker, provides environmental education and behavioral intervention as well as supplies such as vacuum cleaners, green cleaning kits and encasements. The team refers patients to community partners who assist with weatherization, minor repairs, structural integrity or relocation. The program is largely funded through Medicaid via Targeted Case Management (TCM).<sup>10</sup>

To obtain reimbursement, the program convened politicians and the directors of managed care plans and explained the return on investment. A champion in the Oregon Division of Medical Assistance Programs (DMAP) helped carry the work forward, and the program met monthly with DMAP staff. After researching national efforts, the program adapted and implemented core TCM functions,<sup>10</sup> ultimately drafting a State Plan Amendment (SPA), and submitted an SPA waiver to the Center for Medicaid Services. Finally, the program analyzed a policy to determine billable activities, negotiated a rate with DMAP and began TCM. Services are provided to Medicaid-eligible children in Multnomah and Klamath Counties who have poorly controlled asthma or environmentally induced respiratory distress, and case managers must meet minimum requirements per the approved SPA.



Another example of a program with a moderate intensity component is L.A. Cares About Asthma®,<sup>11</sup> established by the L.A. Care Health Plan, which serves Medi-Cal’s vulnerable managed care members residing in low-income communities. This NELA in Asthma Management winner (2012) refers members to local in-home visitation programs so that case workers can provide appropriate environmental tools and materials (pillow cases, mattress covers) after an in-home environmental

assessment. Additionally, the case worker often serves as an advocate to the member by facilitating improvements in the members’ housing conditions that affect asthma, for example, coordinating carpet removal and pest control services with the member’s landlord.

### **Major Remediation:**

*Efforts that involve structural improvements to the home, including carpet removal, replacement of ventilation systems, or extensive repairs of structural integrity (roof, walls and floors).*

An example of a major remediation program is the City of San Diego’s Safe and Healthy Homes Project,<sup>12</sup> which is funded by a U.S. Department of Housing and Urban Development Community Development Block Grant and implements cost-effective measures to create healthy homes for children and seniors. SHHP combines partner program services with other directly funded contracted services to provide the maximum benefit for every enrolled household. An SHHP representative conducts an initial home evaluation, which consists of an occupant interview concerning the existing conditions of the property, the overall health of the residents, and specific questions that will benefit homes with asthmatic children. Visual and environmental examinations are conducted in each room of the residence.

### **Additional Considerations for In-Home Visit Programs: Critical Components to Convey to Potential Funders/Payers**

- **What criteria determine who receives the home visit?** For example, asthma severity, hospitalization/ER visit in the previous 6 months.
- **How are people referred for home visits?** For example, primary care physician, school nurse, hospital, health plan, housing program.
- **How are findings communicated back to a primary care physician?** For example, electronic medical record.
- **How many visits?** For example, 1–3 visits with 6-month and 1-year followups.
- **Who conducts the in-home visit?** For example, community health worker, public health nurse.
- **Where is the in-home visit workforce housed?** For example, housing department, health department.
- **What community partners are critical to the delivery, infrastructure and sustainability of the program?** For example, local healthcare system, schools, housing authority.

The environmental sampling includes testing for lead and asbestos contamination when necessary, testing for sources of moisture that create mold, and checking for carbon monoxide and natural gas. The specific services to be provided to an individual household will be based on the results of the home evaluation.

After the home evaluation is complete, a project designer develops a scope of services that best meets the needs of the household. SHHP direct services may include control of mold problems, repair of plumbing or roof leaks, mold and mildew remediation, exterior property enhancements, home repairs and/or smoke alarms.

Some identified services—such as weatherization improvements, attic insulation, water heater insulation or gas appliance repairs—may require enrollment in partner programs, with SHHP staff assisting in the enrollment process. Once the property owner approves of the written plan, contractors begin the improvements.



## Proof That Home Visits Work<sup>13</sup>

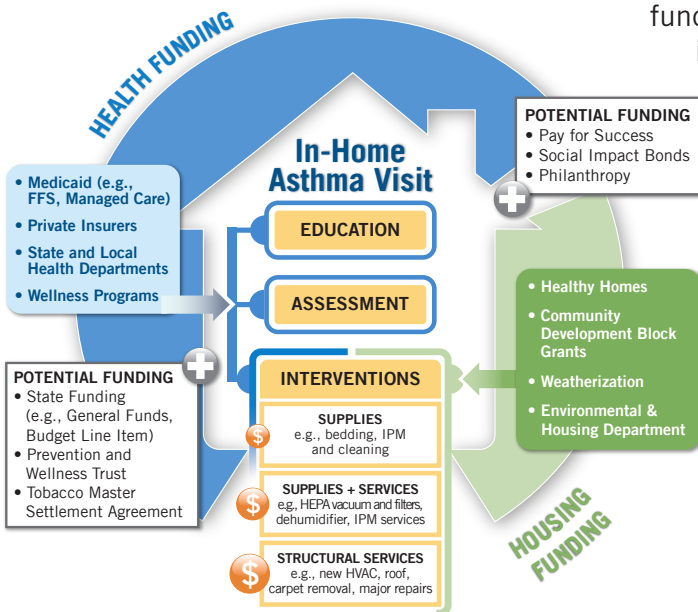
The Community Guide reports that there was strong evidence that the combination of minor to moderate environmental remediation with an educational component provides good value for the money invested based on improvement in symptom-free days, savings from averted costs of asthma care, and improvement in productivity. Individuals had 21 fewer symptom-days per year with 12 fewer school days missed annually and a median decrease of 0.57 acute health care visits per year.<sup>14</sup>

Cost-benefit studies indicated that for every 2007 U.S. dollar spent on the intervention, the monetary value of the resulting benefits, such as averted medical costs or averted productivity losses, was \$5.30–\$14.00.<sup>14</sup> The major factors affecting program cost, in addition to completeness, were the level of intensity of environmental remediation, type of educational component (environmental or self-management), and professional status of and frequency of visits by the home visitor.

## A Look at Sustainable Funding

Funding to support in-home asthma visits can be derived from a number of potential health and housing resources both short-term, such as grants, and long-term, such as health care reimbursement. Bringing multiple streams of funding together to cover the full spectrum of in-home asthma care is often referred to as “braided funding.” Healthcare funding, particularly Medicaid reimbursement, and housing funding streams are often braided together to support multi-disciplinary in-home care—

where, for example, Medicaid pays for disease education while housing funds pay for structural remediation. New funding streams, like social impact financing, are also being explored as supplemental funding to cover costs.



*This illustration represents ways that funding for home-based asthma care services can be combined to cover critical in-home asthma care needs.*





## Preparing for Sustainable Financing

New incentives within the Affordable Care Act, Medicaid’s increasing focus on disease prevention, and other health policy innovations have created “a moment of opportunity” to expand funding for and delivery of in-home visits that address environmental health risks. When coupled with support from housing programs for more intensive repairs of structural integrity, there is an opportunity to increase coverage for, and access to, in-home visits as part of a community’s comprehensive asthma care program.

When approaching payors (health plans, Medicaid) about providing coverage for in-home visit services, in addition to understanding your state’s health coverage landscape, you should be able to clearly and succinctly convey the outcomes, anticipated costs and cost savings your program delivers.

Although programs have successfully identified sustainable financing streams for minor and moderate intensity remediation (e.g., health insurance payors including Medicaid and health plans), moving toward higher intensity environmental remediation increases the difficulty of identifying sustainable financing streams and may require leveraging multiple sources, including housing grants (e.g., Community Development Block Grants).<sup>15</sup>

## Where to Find Additional Information

### Learn More About Sustainable Financing

- AsthmaCommunityNetwork.org’s Financing In-Home Asthma Care Microsite: [www.asthmacommunitynetwork.org/financing](http://www.asthmacommunitynetwork.org/financing)
- AsthmaCommunityNetwork.org’s Value Proposition Tool: [www.asthmacommunitynetwork.org/resources/valueproposition](http://www.asthmacommunitynetwork.org/resources/valueproposition)
- AsthmaCommunityNetwork.org’s Conference Materials (select the “U.S. Housing and Urban Development Regional Summits” dropdown): [www.asthmacommunitynetwork.org/resources/conferences](http://www.asthmacommunitynetwork.org/resources/conferences)
- CDC’s National Asthma Control Program Asthma Self-Management Education and Environmental Management: Approaches to Enhancing Reimbursement: [www.cdc.gov/asthma/pdfs/Asthma\\_Reimbursement\\_Report.pdf](http://www.cdc.gov/asthma/pdfs/Asthma_Reimbursement_Report.pdf)







- National Center for Healthy Housing's 2014 Snapshot of Healthcare Financing for Healthy Homes in the United States: [www.nchh.org/Resources/HealthcareFinancing/Snapshot.aspx](http://www.nchh.org/Resources/HealthcareFinancing/Snapshot.aspx)

### **Learn More About Asthma in the Home**

- AsthmaCommunityNetwork.org's In-Home Program Details (name/description: "in-home"): [www.asthmacommunitynetwork.org/programs](http://www.asthmacommunitynetwork.org/programs)
- AsthmaCommunityNetwork.org's Podcasts: [www.asthmacommunitynetwork.org/podcasts](http://www.asthmacommunitynetwork.org/podcasts)
- AsthmaCommunityNetwork.org's Resource Bank (keyword: "in-home"): [www.asthmacommunitynetwork.org/resources](http://www.asthmacommunitynetwork.org/resources)
- AsthmaCommunityNetwork.org's Videos: [www.asthmacommunitynetwork.org/videos](http://www.asthmacommunitynetwork.org/videos)
- AsthmaCommunityNetwork.org's Webinars (select the "Targeted Home Environmental Interventions" series): [www.asthmacommunitynetwork.org/webinars](http://www.asthmacommunitynetwork.org/webinars)
- EPA's Implementing An Asthma Home Visit Program: 10 Steps to Help Health Plans Get Started: [www.epa.gov/asthma/implementing-asthma-home-visit-program](http://www.epa.gov/asthma/implementing-asthma-home-visit-program)
- EPA's Asthma Home Environment Checklist: [www.epa.gov/asthma/asthma-home-environment-checklist](http://www.epa.gov/asthma/asthma-home-environment-checklist)
- CDC's National Asthma Control Program Resources: [www.cdc.gov/asthma/default.htm](http://www.cdc.gov/asthma/default.htm)
- HUD's Healthy Homes Program (HHP): [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/healthy\\_homes/hhi](http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/hhi)

# Glossary

**Allergen-Impermeable Mattress and Pillow Covers:** pillow covers that block dust mite and animal dander allergens.

**Caregivers:** a family member or paid helper who regularly looks after a child or a sick, elderly or disabled person.

**Coverage:** the amount of protection given by an insurance policy.

**Dehumidifiers:** a device that removes excess moisture from the air.

**Encasements:** protective covers that encase mattresses and box springs and eliminate many hiding spots. For more information, please visit [www2.epa.gov/bedbugs/protecting-your-home-bed-bugs](http://www2.epa.gov/bedbugs/protecting-your-home-bed-bugs).

**Green Cleaning Kits:** a kit including products with environmentally friendly ingredients and cleaning methods and procedures that are designed to preserve human health and environmental quality. For more information, please visit [www2.epa.gov/greenerproducts](http://www2.epa.gov/greenerproducts).

**Housing Grant:** a flexible program that provides communities with resources to address a wide range of unique community development needs. For more information, please visit [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/comm\\_planning/communitydevelopment/programs](http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs).

**Incentives:** an entity that motivates or encourages one to take certain actions.

**Integrated Pest Management:** an effective and environmentally sensitive approach to pest management that uses current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means with the least possible hazard to people, property and the environment. For more information, please visit [www2.epa.gov/safepestcontrol](http://www2.epa.gov/safepestcontrol).

**Leveraging:** use of something to its maximum advantage.

**Morbidity:** (1) a departure from a state of physiological or psychological well-being; (2) how often a disease occurs in a specific areas or the relative incidence or disease; (3) duration of illness in a person.

**Pharmacologic Treatment [Asthma]:** the use of drugs when treating asthmatic patients.

**Remediation:** reversing or stopping environmental damage that causes adverse health outcomes. For more information, please visit [www2.epa.gov/asthma](http://www2.epa.gov/asthma).

**Respiratory Therapist:** a specialized health care practitioner who has graduated from a university and passed a national board-certifying examination and treats people with health care issues affecting the cardiopulmonary system such as asthma, emphysema, pneumonia, cardiovascular disorders and trauma.

**Sustainable:** able to be maintained at a certain rate or level.

**Symptom-Days:** days or nights asthma patients experience symptoms such as coughing, shortness of breath, wheezing, chest tightness (pain or pressure), or disturbed sleep as a result of asthma that can result in a child missing school or other activities.

**Triggers:** factors that can cause asthma symptoms, an episode or an attack or make asthma worse (e.g., secondhand smoke, dust mites, mold, cockroaches and pests, pets, nitrogen dioxide, chemical irritants, outdoor air pollution and wood smoke). For more information, please visit [www2.epa.gov/asthma/asthma-triggers-gain-control](http://www2.epa.gov/asthma/asthma-triggers-gain-control).

**Weatherization:** the practice of protecting a building and its interior from the elements, particularly from sunlight, precipitation and wind and of modifying a building to reduce energy consumption and optimize energy efficiency. For more information, please visit [www2.epa.gov/sites/production/files/2014-08/documents/climate\\_readiness.pdf](http://www2.epa.gov/sites/production/files/2014-08/documents/climate_readiness.pdf).

## References

<sup>1</sup>Because evidence exists that current asthma prevalence in children in the state of Washington likely is underreported ([www.doh.wa.gov/Portals/1/Documents/Pubs/345-269-CYAsthmaReport.pdf](http://www.doh.wa.gov/Portals/1/Documents/Pubs/345-269-CYAsthmaReport.pdf)) and racial misclassification results in an underestimation of American Indian and Alaska Native hospitalization rates ([www.crihb.org/ctec-reports/](http://www.crihb.org/ctec-reports/)), it is likely that asthma rates among Native children are higher than reported.

<sup>2</sup>[www.ncbi.nlm.nih.gov/books/NBK7232](http://www.ncbi.nlm.nih.gov/books/NBK7232)

<sup>3</sup>[www.thecommunityguide.org/asthma/rrchildren.html](http://www.thecommunityguide.org/asthma/rrchildren.html)

<sup>4</sup>[www.thecommunityguide.org/about/task-force-members.html](http://www.thecommunityguide.org/about/task-force-members.html)

<sup>5</sup>[www.thecommunityguide.org](http://www.thecommunityguide.org)

<sup>6</sup>[www.thecommunityguide.org/asthma/supportingmaterials/Asthma%20Evidence%20review.pdf](http://www.thecommunityguide.org/asthma/supportingmaterials/Asthma%20Evidence%20review.pdf)

<sup>7</sup>Gema Dumitru, CDC, presented at EPA's "The Science and Value Behind Targeted Home Environmental Interventions" webinar, October 22, 2009.

<sup>8</sup>[www.asthmaawards.info](http://www.asthmaawards.info)

<sup>9</sup>[www.asthmacommunitynetwork.org/node/3309](http://www.asthmacommunitynetwork.org/node/3309)

<sup>10</sup>[www.asthmacommunitynetwork.org/Multnomah-County-Health-Department](http://www.asthmacommunitynetwork.org/Multnomah-County-Health-Department)

<sup>11</sup><http://kff.org/medicaid/state-indicator/targeted-case-management>

<sup>12</sup>[www.asthmacommunitynetwork.org/node/8719](http://www.asthmacommunitynetwork.org/node/8719)

<sup>13</sup>[www.asthmacommunitynetwork.org/node/1141](http://www.asthmacommunitynetwork.org/node/1141)

<sup>14</sup>[www.thecommunityguide.org/asthma/index.html](http://www.thecommunityguide.org/asthma/index.html)

<sup>15</sup>[www.thecommunityguide.org/asthma/multicomponent.html](http://www.thecommunityguide.org/asthma/multicomponent.html)

