



Green & Healthy Homes Initiative[®]

Sustainable Funding and Business Case for GHHI Home Interventions for Asthma Patients

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HEALTH MANAGEMENT ASSOCIATES

The Green & Healthy Homes Initiative (GHHI) is pleased to release *Sustainable Funding and Business Case for GHHI Home Interventions for Asthma Patients* — a publication assessing ways in which effective, comprehensive home interventions can be integrated with the healthcare system payment structure. This represents the first in a series of GHHI papers that will address new pathways for sustainable funding in alignment with the healthcare system.

With generous support from the Osprey Foundation and the JPB Foundation, GHHI commissioned and partnered with Health Management Associates (HMA) in the preparation of this paper. GHHI asked HMA to explore medical payment models and other funding streams related to health based housing. HMA consultants are foremost experts in the fields of health and human services policy, healthy economics and finance, program evaluation, data analysis, and health system restructuring.

Our goal in producing this work is to advance the dialog around housing as a platform for health, and to begin suggesting viable action steps for policy makers and healthcare industry leaders. GHHI delivers evidenced-based interventions to families and has achieved significant results. A peer-reviewed study published in the Environmental Justice journal of the GHHI program in Maryland showed a 66% reduction in hospitalizations and a 28% reduction in emergency room visits for asthmatics. With health care reform and innovation efforts currently taking place—aimed at delivering better care, producing a healthier population, and reducing healthcare costs—there is a unique window now to bring more health care investment to the activities of GHHI and similar healthy homes programs. This report identifies sustainable health-related funding streams for asthma-related home interventions, looks at payment structures, and examines the business case for healthcare payers to fund these services.

Thank you,

A handwritten signature in black ink, appearing to read "Ruth Ann Norton".

Ruth Ann Norton
President & CEO
Green & Healthy Homes Initiative

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Executive Summary

Nearly 7 million children and more than 18 million adults in the US have asthma. Some 1.8 million asthma-related emergency department visits occur annually in the US. Nearly 440,000 hospital stays, averaging 3.6 days, are related to the flare-ups and complications of asthma. This chronic condition has generated \$56 billion in annual medical spending and lost productivity.

These gripping facts clearly show that new approaches to managing asthma are needed. At the heart of a better approach to asthma management is to control the forces that drive asthma patients into hospitals. We can improve the quality of life for children and adults with asthma and at the same time save considerable money by doing so.

An essential component of a new asthma management strategy involves home interventions to uncover and remedy triggers that can exacerbate asthma. The Green & Healthy Homes Initiative (GHHI) is a national leader in conducting comprehensive home interventions.

The purpose of this report is to identify sustainable funding streams for asthma-related home interventions, with a special focus on Medicaid; determine new ways to structure payment arrangements; and examine the business case and return on investment for asthma home interventions. We have reached the following conclusions:

Current Approaches to Sustainable funding

Traditional health care payment systems have largely excluded activities that are not conducted “within the walls” of the health care delivery system and services that are provided by people who are not clinicians. But recent developments make it clear that it is entirely possible to obtain Medicaid funding for activities such as GHHI home interventions, and to convince other payers to cover these services. A recent change in federal law opens the door somewhat to coverage for comprehensive home interventions to address risk factors and triggers related to asthma. A new CMS rule applies more to allowing non-clinicians to provide services than to broadening the settings in which these services are provided. Yet, the new flexibility is an important starting point. States have not yet pushed the envelope to see how far they can extend the new federal permission. Several approaches to using Medicaid funding for GHHI-type activities are underway including Targeted Case Management (TCM); State Plan Amendments; Medicaid “administrative claiming”; EPSDT; and Section 1115 waivers.

- **Targeted Case Management:** TCM is best suited to covering home assessments, the development of individualized action plans, and referrals to other services. This can free up a portion of outside grant support to be used for remediation of asthma triggers and home repairs.
- **SIM grants:** Another approach is for GHHI home interventions to be a type of pilot site under either Centers for Medicare and Medicaid Innovation (CMMI) Innovation grants or State Innovation Model (SIM) grants. SIM grants in particular encompass community-based health-promoting initiatives that transcend the walls of the medical delivery system.

- **Services ordered by a clinician:** While there is now more regulatory flexibility to use non-clinicians to deliver home-based services, *the chances of getting approval for reimbursement will be enhanced if the services are recommended or ordered by a clinician such as a pediatrician, a nurse, or a nurse practitioner.*
- Organizations such as GHHI should consider “braiding” funding streams for different elements of the overall service delivery model rather than adopting an “either/or” approach.
- GHHI can directly approach Medicaid managed care organizations to get them to cover home interventions. In Maryland, hospitals are now operating under global revenue caps, and are at-risk for higher ED use and admissions and readmissions. In this environment, GHHI could directly approach hospital systems for support of their activities.
- Reimbursements by public and private payers will be more likely if as many as possible of the participants in home visits obtain the credentials in their field. This does not mean clinical credentials, but those available to community health workers and asthma educators. The challenge here is to seek a balance between encouraging the asthma home visit work force to obtain the training and credentials that can help them do their job as well as possible, and also likely help in obtaining reimbursement, without “over-professionalizing” these workers.

New approaches to payment

- GHHI should consider “bundled payment” arrangements for its services, under which the organization is paid a fixed amount for a series of home visits per patient.
- Another approach to payment reform is to encourage provider systems that are assuming partial risk for a defined set of services over a defined time period, under ACO and other gain-sharing models, to include GHHI services in their delivery systems to help them meet targets.
- GHHI could also be helpful to health systems participating in global payments, under which provider systems accept a single payment for all health services delivered for each patient over a period of time such as a month or a year.
- Medicaid managed care organizations (MCOs) frequently have incentive payments in their contracts with states that are tied to achieving quality goals. GHHI could negotiate agreements with MCOs under which home interventions would be covered services because the health plans understand that these services will help them achieve quality targets leading to bonus payments.
- In any payment structure, GHHI could negotiate bonuses if ED visits and inpatient stays related to asthma fall. These bonuses could be structured on a sliding scale basis, becoming larger in step with steeper decreases in these utilization measures.

Home interventions for asthma patients have a positive ROI and are cost-effective

- There is ample evidence that the benefits of home interventions for asthma patients exceed the costs. Research findings also indicate that important health outcomes—such as symptom-free days—can be gained for very small investments of resources.
- In one study of the impact of home interventions for children with asthma, ED visits fell by 68% a year after the intervention while hospital admissions fell by nearly 85%. The ROI was 1.46, meaning that for each dollar invested, \$1.46 was saved.
- The research findings are in line with an actuarial study conducted for GHHI by Milliman, which found a positive ROI.
- The primary health benefits of GHHI interventions are reduced medical spending arising from fewer ED visits and hospital admissions. But a broader analytic framework illustrates that there will be a positive “life-cycle effect” from these interventions. Children who miss fewer days of school and are healthier will be more productive workers as adults and have higher lifetime earnings than those who are plagued by continuous poor health as children. Thus, the “social rate of return” is undoubtedly higher than the shorter-term savings in medical spending.
- In addition, the lower medical spending will, over time, lead to lower health care premiums. This will keep more people in the job-based health insurance system, and lower federal and state health care spending.
- Community needs assessments can highlight the need for the type of work that GHHI conducts. Such assessments can facilitate the redeployment of funding from areas of excess capacity or poor performance to areas where a community is under-investing, paving the way to improving health outcomes while lowering total spending. *This helps make the “business case” for GHHI—it is not simply an “add-on” to the current system, but rather an important component of a community-wide plan to spend available resources more wisely.*
- In order of priority, GHHI should: (1) make a business case to Medicaid managed care organizations to cover its home interventions; (2) work with selected states to use a combination of targeted case management, state plan amendments, and waivers to cover GHHI interventions; and (3) develop bonus payment and bundled payment arrangements for use with both public and private payers.

Introduction and Statement of Purpose

The purpose of this report is to develop a range of options for sustainable funding for the home interventions for patients with asthma conducted by the Green & Healthy Homes Initiative (GHHI). We present three sets of findings and recommendations.

1. Promising strategies for obtaining Medicaid funding for GHHI home interventions
2. A range of alternatives for structuring the payments for GHHI services
3. An explanation of how best to build the “business case” for investing in GHHI home visits, to convince both public and private payers to reimburse GHHI for its work.

Background

- CDC estimates that 6.8 million children in the US have asthma, or 9.3% of all children. Some 18.7 million adults in the US have asthma, or 8.0% of all adults.¹
- Patients with asthma as a primary diagnosis make 14.2 million physician visits annually, 1.3 million visits to hospital outpatient departments, and 1.8 million visits annually to emergency departments.²
- There were 439,000 hospital discharges in 2012 with asthma as the first-listed diagnosis, with an average length of stay of 3.6 days.³
- Poor and minority children suffer a disproportionate burden of this chronic condition.⁴ CDC figures show that while the prevalence of asthma is 7.4% among whites, it is 9.9% among blacks; the overall figures for Hispanics is 5.9%, but is 14.6% among people from Puerto Rico, compared to 4.7% among those of Mexican and Mexican American descent.⁵
- The annual cost of asthma in the US has been estimated to be \$56 billion when both direct medical costs and lost productivity are taken into account.⁶
- As the third leading cause of hospitalizations among children under 15 years of age, asthma is associated with increasing ED visits.⁷

Effective asthma management requires the care of physicians and physician extenders; proper medication adherence; comprehensive education on self-management; allergen control; and an

¹<http://www.cdc.gov/nchs/fastats/asthma.htm>

²<http://www.cdc.gov/nchs/fastats/asthma.htm>

³<http://www.cdc.gov/nchs/fastats/asthma.htm>

⁴Centers for Disease Control and Prevention. 2011 National Health Interview Survey (NHIS) Data. Tables 2-1 and 3-1. <http://www.cdc.gov/asthma/nhis/2011/table3-1.htm>

⁵http://www.cdc.gov/asthma/most_recent_data.htm

⁶ Pearson, WS, Goates SA, Harrykissoon SD, Miller SA. State-Based Medicaid Costs for Periodic Asthma Emergency Department Visits. *Prev Chronic Dis* 2014;11:140139. DOI: <http://dx.doi.org/10.5888/pcd11.140139>.

⁷Childhood Asthma Leadership Coalition. Using Medicaid to Advance Community-Based Childhood Asthma Interventions: A Review of Innovative Medicaid Programs in Massachusetts and Opportunities for Expansion Under Medicaid Nationwide. Issue Brief. February 2013.

individually-tailored, written asthma action plan.⁸ But the care delivered within the walls of the health care system must be complemented by interventions to reduce and remove conditions in the home that trigger and exacerbate asthma. Unless these conditions at home are assessed and corrected, both adults and children will continue to experience flare-ups and complications related to asthma that drive them into emergency rooms, and sometimes result in hospitalizations.

Less than half of asthma patients report being taught how to avoid asthma triggers in their homes. Of those who did receive this education, 48% did not adhere to trigger-reduction strategies.⁹

The traditional payment systems in the public and private sectors have generally ruled out payment for services delivered by people who are not licensed health care providers, and have limited payment opportunities for services that are delivered in non-clinical settings, such as homes, schools, or workplaces. Over the years, payers have reimbursed for care delivered by hospitals, nursing homes, rehab centers, physicians, nurses, nurse practitioners and physicians' assistants. These reimbursed services were primarily delivered in health care facilities and physicians' offices. Furthermore, the traditional payment systems have not generally paid for services that are not considered "health care" even when there is substantial evidence showing a direct impact on health and health care costs.

Now that is beginning to change. This report highlights a number of promising programs for asthma patients that are delivered by non-clinicians and in home settings. The main focus is on Medicaid and Medicaid managed care organizations. Many of the ideas in the report, however, could also be helpful in approaching commercial insurers and self-insured large employers.

We present a series of alternative funding streams to cover home visits for asthma patients, a variety of ways to structure payments for these services, including performance incentives, and a broad approach for demonstrating to payers that there is a positive rate of return on this investment.

This study is very timely as it will be unfolding against the backdrop of major innovations in health care delivery and financing under State Innovation Model (SIM) grants, patient-centered medical homes, accountable care organizations (ACOs), and an expansion of insurance coverage that is driving the nation toward better access to care and more transparency and accountability in payment.

Presenting a Toolkit of Sustainable Medicaid Funding Streams

This section will present a user-friendly toolkit of Medicaid funding mechanisms for GHHI's work. The options presented below highlight several key working principles:

1. While there is now more regulatory flexibility to use non-clinicians to deliver home-based services, *the chances of getting approval for reimbursement will be enhanced if the services are recommended or ordered by a clinician such as a pediatrician, a nurse, or a nurse practitioner.*
2. Organizations such as GHHI should consider "braiding" funding streams for different elements of the overall service delivery model. The options we present are not in "either/or" frameworks.

⁸Childhood Asthma Leadership Coalition.Supra.page 2.

⁹"Vital Signs: Asthma in the US." Centers for Disease Control and Prevention. May 2011.
<http://www.cdc.gov/vitalsigns/asthma/>

The term braiding is used because each funding source is still governed under its own regulations, and they are not literally blended. Braiding means woven together.

3. There are several pathways into Medicaid funding for GHHI activities, and each one offers both promises and limitations. What works in one state may be very different than the best approach in another state, as delivery systems and payment models will vary from state to state, as will each state's "appetite" for testing innovative new approaches.
4. Nationwide, a large majority of Medicaid enrollees are in managed care plans, and GHHI can work directly with these plans to make the value proposition for reimbursement of home visits.
5. While fee-for-service payments for a portion of the cost of GHHI home inspections are feasible, a better approach over time should be a kind of bundled payment for a "suite" of visits adequate to get the patient well and continuously control asthma to avoid flare-ups and complications. Another way to think of this is that a payment for a series of home visits for people with asthma could be incorporated into per member per month (pmpm) payments to a health plan from Medicaid or other payers.
6. Another approach to bundled payments is to encourage provider systems that are assuming partial risk for a defined set of services over a defined time period, under ACO and other gain-sharing models, to include GHHI services in their delivery system to help them meet targets. GHHI could also be helpful to health systems participating in global payments, under which provider systems accept a single payment for all health services delivered for each patient over a period of time such as a month or a year.
7. This will be particularly true in Maryland where all hospitals are now under global budgets. Indeed, under Maryland's new All-Payer Model, all hospitals are at risk for high ED use, high admissions, high readmissions, and increases in hospital outpatient care (unlike the long-standing previous All-Payer system where hospitals were accountable for cost per hospital admission). In this new environment, hospital systems may be more likely to be interested in paying for GHHI home visits, as these services may help them meet their global revenue caps.
8. Reimbursement by public and private payers will be more likely if as many as possible of the participants in home visits obtain the credentials in their field. This does not mean clinical credentials, but those available to community health workers and asthma educators. The challenge here is to seek a balance between encouraging the asthma home visit work force to obtain the training and credentials that can help them do their job as well as possible, and also likely help in obtaining reimbursement, without "over-professionalizing" these workers.
9. The "business case" for GHHI should include information on reduced ED visits and inpatient admissions but should also encompass savings outside the health care system, such as reduced absenteeism from school and work, as well as improved mobility for patients and improved productivity. Creative financing models could include "social impact bonds."

New CMS Rule Updating Medicaid Regulations Based on ACA

The Affordable Care Act has opened the door to new CMS regulations that broaden the scope of the types of providers that Medicaid may reimburse. As noted above, Medicaid coverage has been mainly limited to services that are provided by physicians or other licensed practitioners such as nurses, nurse practitioners, and physician assistants. This had the effect of limiting Medicaid coverage of preventive services to those provided in a clinical setting. The new rule, which went into effect in January 2014, allows coverage for services that are recommended by a physician or other licensed provider but not necessarily delivered by these providers.¹⁰ Now, if this test is met, Medicaid can pay for community-based asthma interventions delivered by asthma educators, healthy homes specialists, and other community health workers in the home, school, or other community location.¹¹

There is divided opinion about the reach and impact of this CMS rule change. Some contend that “only the ‘who’ has changed, not the ‘what’ and that the traditional CMS approach to reimbursement still stands—that is, preventive services must be medical/remedial in nature and that “services must involve direct patient care and be for the express purpose of diagnosing, treating or preventing illness, injury, or other impairments to an individual’s physical or mental health. Non-medical preventive services that address broader social or environmental concerns are not covered.¹²” But others believe that at a minimum, the new ruling allows state Medicaid programs to cover non-clinical providers, and that there may be some flexibility in the setting as well. This will have to be tested.

These non-clinical providers include community health workers and certified asthma educators, *as long as the service was initially recommended by a physician or other licensed practitioner.*¹³ This is the first of several observations in this report suggesting that for groups such as GHHI to obtain the reimbursement they seek, it will be most helpful to coordinate with physicians, nurses, and other clinicians. *The silos separating the realm of primary medical care and home-based environmental assessments must be removed to maximize the likelihood of success.*

This new CMS rulemaking has not yet been fully tested so it is difficult to know the limitations or boundaries. States have not rushed to take up this option. The key point is the federal government has “opened the door” at least somewhat, and this provides new opportunities to obtain Medicaid coverage for asthma home visits.

¹⁰Childhood Asthma Leadership Coalition. “Medicaid & Community-Based Asthma Interventions: Recent Changes & Future Steps.”

¹¹ Medicaid and Children’s Health Programs: Essential Health Benefits in Alternative Benefit Plans, Eligibility Notices, Fair Hearing and Appeal Processes, and Premiums and Cost Sharing; Exchanges: Eligibility and Enrollment; Final Rule. Centers for Medicare & Medicaid Services. 78 Fed.Reg. 42160 (July 15, 2013) (codified at 42 C.F.R. Section 440.130).

¹²CMS. “Medicaid Preventive Services: Regulatory Changes.” April 2014. <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Downloads/Preventive-Webinar-Presentation-4-9-14.pdf> See also State Medicaid Manual, section 4385,

¹³ Pearson, Goates, et al. *supra*.

Working with Medicaid through a variety of mechanisms to obtain coverage of GHHI initiatives

This section highlights several strategies for obtaining Medicaid coverage for GHHI home visits. Discussions with experts in the field suggest that these options should not be thought of as mutually exclusive. Indeed, the best advice is to work with state Medicaid officials as they try to obtain maximum flexibility for innovation to serve people with chronic illnesses, including but not limited to asthma, in settings outside of the traditional health care delivery system, using people who are not clinicians but bring vital experience and knowledge in ameliorating the many conditions in the home that exacerbate chronic illnesses such as asthma.

Targeted Case Management (TCM) and State Plan Amendments

TCM programs cover assessment, development of care plans, and referrals for services/interventions. This could cover a part of what GHHI does, though not likely the work of GHHI employees and contractors who make significant repairs to a home. Again, a key could be getting a physician or nurse practitioner to “write an order” for this visit, and also to include some clinical element (e.g. medication checks) on the site visit.

For example, in Multnomah County, Oregon, the Health Care Reimbursement for Healthy Homes program is funded in part by a TCM program. This program has a mix of staff with different skills, *but it includes a nurse case manager who is a licensed registered nurse* along with community health workers, asthma educators, and registered environmental health specialists.¹⁴

TCM funding is being blended with local, state, and federal funding in Multnomah County. In a fashion that holds lessons for many other communities, this Oregon County is using a “mix and match” approach in which each funder covers a certain set of elements that, taken together, comprise the entire bundle of services provided in asthma home visits. The TCM funding covers the assessments, care plans, and referrals to community services; the supplies needed in the home, such as vents, sheets, and fans, are covered by a grant from the County’s general fund. There is a Memorandum of Understanding (MOU) with the city for the actual home repairs. The County is using a portion of Community Development Block Grants (CDBG) for yet another set of services (lead hazard removal). The US Department of Housing and Urban Development (HUD) is also a funder.

A state may seek a state plan amendment from Medicaid at any time, and CMS must respond within 90 days. If the SPA is approved, the change is permanent. Multnomah County, Oregon has used an SPA in support of its Targeted Case Management—Healthy Homes program. Reimbursable services include environmental assessments, care coordination, and linking patients with community agencies and resources.

Multnomah County worked closely with the State of Oregon and CMS to obtain this State Plan Amendment. The leader of this project, Kim Tierney, considers TCM and SPAs not as alternative choices but as complementary strategies to obtain the flexibility and authority to help finance home visits for people with asthma.

¹⁴Presentation of Kim Tierney, GHHI conference.

In Maryland, Dr. Laura Herrera, Deputy Secretary for Public Health at the Maryland Department of Health & Mental Hygiene, notes that Local Health Improvement Coalitions (LHICs) can complement medical care by linking high-need patients with wrap-around community-based health services and that Maryland will use new data and mapping services to “hot-spot” high utilizers and bring them into Community Integrated Medical Homes. In Maryland, CRISP, the organization that is building the Health Information Exchange (HIE), is developing mapping tools for hot-spotting, which can identify at the small neighborhood-level pockets of high concentrations of certain chronic diseases. Community health workers and care managers would be used to reach out to high utilizers.

Maryland is using several approaches—Community Integrated Medical Homes (CIMH), the SHIP plan and the local area planning coalitions emerging from this plan, and the involvement of local health departments—to extend the patient-centered medical home model beyond the walls of the medical care system. Maryland is committed to moving ahead with multi-stakeholder engagement in public health initiatives at the local level. The state is committed to addressing the social determinants of health as an effective complement to patient centered medical homes. *Home visits for asthma patients can clearly contribute to this approach.*

Working with the major regulatory agencies in Maryland

Three major state agencies, the Department of Health and Mental Hygiene (DHMH), the Maryland Health Care Commission (MHCC), and the Health Services Cost Review Commission (HSCRC), will be collaborating to improve care management for patients with complex medical needs to support the achievement of the targets under the new Maryland All-Payer System. HSCRC established a Care Coordination Work Group that held six public meetings from November 2014 through March 2015. The Work Group’s report will be published in May 2015. It will be recommending a series of statewide investments to identify high-needs populations, conduct health risk assessments, and develop individualized care profiles and care plans to address the complex medical and social needs of these groups. One of the key high-needs populations is comprised of people with one and frequently multiple chronic illnesses. The work of GHHI could be very relevant to the recommendations of this Work Group.

Maryland has promised to meet targets agreed upon with CMS that will hold the rate of total per capita hospital spending to the rate of growth of the State’s economy, and also produce a cumulative \$330 million in savings to Medicare over five years. Maryland has also committed to reducing hospital readmissions to the national average and reducing preventable complications in hospital care.

These targets can only be met if the state is able to bring about reductions in ED use, inpatient admissions, readmissions, and hospital outpatient department visits. In turn, those outcomes can only be met if the care of people with chronic medical conditions is managed properly. Targeting people with asthma who have already hit the system with emergency department visits and hospitalizations for comprehensive assistance can support the achievement of the key goals of the new All-Payer system. It is now widely recognized in Maryland that this care management must include not only patient-centered medical homes but also community-based interventions that address some of the key underlying forces that are driving people into the medical care system in the first place. This is where GHHI fits in.

CMMI Innovation Grants

Another avenue under which some states are addressing the redesign of delivery and payment systems involves CMMI Innovation grants.

New England coalition uses CMMI grant for asthma project

Health Resources in Action (HRiA) was given a Center for Medicare and Medicaid Innovation (CMMI) Health Care Innovation Award to support the New England Asthma Innovation Collaborative (NEAIC). NEAIC is a multi-state, multi-sector partnership with health care providers, payers, and policymakers. The goal is to assist low-income children with severe asthma conditions using community health workers. A key objective is to promote sustainable funding and infrastructure for the delivery of cost-effective home-based care and education to children with poorly controlled asthma. CMS wants this initiative to foster problem solving, mentoring, strategizing, the sharing of best practices, and work force development in the community.¹⁵

Some 1,400 children with at least one asthma-related emergency department visit, observation stay, hospitalization, or oral corticosteroid prescription for asthma in the 12 months prior to the start of the program will be enrolled. NEAIC will train health care workers and asthma educators to deliver services in a home environment.

In Massachusetts, one of several states participating in this program, providers include Children's Hospital Boston, the Boston Medical Center (BMC), and Bay State Children's Hospital. Payers in the state include Neighborhood Health Plan, BMC Health Net, and Healthy New England.

This Massachusetts portion of the New England program follows the "Krieger Model" under which three to four home visits are made by a CHW, *overseen by an asthma nurse*. In Vermont, the model is modified and the first visit is made by both a CHW and an asthma educator, while the second and third visits are made just by a CHW.¹⁶

Massachusetts received a one-time grant for their work so there will still be a challenge around sustainability. This fact points to the importance of State Innovation Models (SIM) grants to help states create lasting changes in delivery and payment systems.

The SIM initiative is providing financial and technical support to states for the development and testing of state-led, multi-payer care payment and service delivery models designed to improve health system performance, improve quality of care, and decrease costs for Medicare, Medicaid, and CHIP beneficiaries, and ultimately for all residents of the states. Over \$620 million in Model Test awards are supporting 11 states that are ready to implement their State Health Care Innovation Plans.¹⁷ *GHHI should approach some of these states to see how their work can help the states achieve their objectives under their SIM grants.*

¹⁵ <http://hria.org/services/policy-practice/cs-neaic.html>

¹⁶ New England Asthma Innovations Collaborative: Year One: Presentation by Laurie Stillman and Stacey Chacker. http://www.slideshare.net/ARC_NE/neaic-year-1-in-review-presented-by-laurie-stillman-and-stacey-chacker

¹⁷ <http://innovation.cms.gov/initiatives/state-innovations/>

Medicaid Administrative Claiming

Some administrative costs in the Medicaid program could be reimbursable with a federal match. The Texas Childhood Lead Poisoning Prevention Program (TxCLPPP) began receiving reimbursement for administrative claims based on 16 tasks that program staff perform and the percentage of children they serve who are Medicaid enrollees (42 U.S.C. Section 1396(a)).¹⁸

In this Texas Medicaid Administrative Claiming (MAC) program, state-affiliated public agencies may submit claims for reimbursement for administrative activities supporting the Medicaid program. The state Medicaid agency requested information about the number of staff (FTEs) in the program, program activities, job descriptions, and a projected annual claim amount based on the number of Medicaid enrollees served in environmental lead assessments.¹⁹ TxCLPPP documented program activities in a detailed fashion and used this formula for claiming:

1. Federal share of the state-federal match (Federal financial participation, or FFP): 50%
2. Proportion of the population served that are Medicaid enrollees: 87%
3. Salaries of staff who perform reimbursable activities: Total salaries
4. Projected annual claim: 50% multiplied by 87% multiplied by total salaries
5. Projected annual claim: $(0.5) (0.87) (\text{total salaries}) = \$267,000$.

The Texas Department of State Health Services (DSHS) requested approval to submit this claim via a CMS 64 Report to the State Medicaid Director (enabling legislation 42 U.S.C. Section 1396(a)). The request was approved by the State Medicaid agency in March 2011. In April 2011, the State Medicaid Director sent a letter to the Regional CMS Regional Office notifying them of Texas Health and Human Services Commission (HHSC)'s intent to add the relevant TxCLPPP staff to the state's administrative claim.²⁰ Approval was granted.

Through a process of maximizing the availability of federal administrative matching funds, the state was able to pay for a portion of the costs of TxCLPPP with substantial federal support.

The TxCLPPP suggests the following lessons and advice:

- Learn about the State Plan in your state
- Consult with your regional CMS representative
- Gather detailed information about your program's cost and projected savings
- Understand that reimbursement may not cover 100% of your costs
- Note that reimbursement mechanisms that involve federal matching funds will make a program more attractive to your state
- Engage your financial and accounting staff early in the process
- Build on tools and resources used in other states
- Build relationships to gain access to critical data

¹⁸National Center for Healthy Housing. "Pathways to Reimbursement: Understanding and Expanding Medicaid Services in Your State."

¹⁹ It seems likely that this same process could be applied to asthma home assessments.

²⁰National Center for Healthy Housing. "Reimbursement for Healthy Homes Services: A case study of leveraging existing Medicaid authority in Texas."

- Have a champion who takes responsibility for keeping the process moving.²¹

Working directly with Medicaid MCOs

A very promising approach to entering the realm of Medicaid reimbursement is for GHHI to go directly to the Medicaid managed care organizations (MCOs) and make a good business case for their services to be covered by the health plan.

MCOs have considerable flexibility to contract with groups such as GHHI as part of their plan to reduce the cost of chronic diseases and improve their quality and performance. This is a key advantage over Medicaid fee-for-service arrangements, which continue to shrink in size as states move more of their high-need populations into managed care. The FFS world is bound by rigid rules and regulations, and the MCOs have much more flexibility in deciding what services to cover, including those provided by non-clinicians in non-traditional settings.

States employ a number of different incentive arrangements with MCOs to encourage them to focus on quality of care, and this presents opportunities for sustainable funding for GHHI. They also receive federal grants under the ACA provision 4108 on the Medicaid Incentives for the Prevention of Chronic Disease Model. Ten states are receiving federal grants under this program designed to address the social and behavioral circumstances that influence the participation in prevention programs and improve health outcomes.²² In addition to program improvement plans, states also hold plans accountable for meeting the targets embedded in quality metrics, and if the plans are successful, they can receive a bump up in their per capita payments for good and/or improved performance.

Therefore, one approach that GHHI could take would be to assess carefully various incentive programs employed by state managed care programs to see how they could tie their services directly into those incentive programs, and then make the case to the MCOs that payments to GHHI for their home visits could help the MCOs achieve their goals and get their incentive payments from the state.

A proactive approach for GHHI would be to work with Maryland and other states to get quality metrics directly related to asthma management built into the Performance Improvement Program incentives incorporated into Medicaid contracts with MCOs.

There is precedent for this type of arrangement. Pennsylvania used the contracting process with Medicaid MCOs to develop a quality measure directly related to lead-based paint screening. This quality metric was built into MCO contracts and the MCOs were accountable for and could be rewarded for making improvements in this area.

Health plans are entitled to receive incentive payments for health care delivery system-related projects up to 5% above the capitation rates (payments in excess of this may be allowable under a Section 1115 waiver). The plans may use this extra payment to pay the provider performing the service. (42 CFR 438.6(c) (1).

²¹National Center for Healthy Housing. "Reimbursement for Healthy Homes Services: A case study of leveraging existing Medicaid authority in Texas.

²²<http://innovation.cms.gov/initiatives/mipcd/>

Under these incentive payments, the contract must provide that the arrangement is (1) for a fixed amount and not be conditioned on inter-governmental transfers; and (5) necessary for specified activities and targets. (438.6(c)(5)(iii). Of course, states would need to put in some funding to satisfy the non-federal share of the payments.

In the next section we present some bonus payment arrangements for achieving certain outcome goals which could be used under MCO incentive payment arrangements. These include gain-sharing arrangements if certain targets are met regarding reductions in ED and inpatient use.

Another possibility, also described below, is auto-assignment algorithms that reward health plans demonstrating that they have the ability to well manage certain patient populations such as children with asthma.

The idea here is that Medicaid would set up gain-sharing arrangements with MCOs, and in turn, the MCOs would have an incentive to pay for GHHI services which will help them achieve their gains. In this way, the gain-sharing first goes from Medicaid to the MCO, and then from the MCO to GHHI.

MCOs may contract with GHHI now under existing contract arrangements if the value proposition convinces them that the savings will exceed the cost of paying for the home visits.

A Medicaid MCO gets recognition and support from EPA

The U.S. Environment Protection Agency (EPA) delivers a national, multi-faceted education and outreach initiative to increase public awareness and action to manage environmental asthma triggers as part of comprehensive asthma management. An important part of this initiative is the recognition of exemplary programs and community leaders to serve as national models and mentors for community asthma care improvement.²³

One of the EPA awardees is the Peach State Health Plan in Atlanta, Georgia. This Medicaid MCO is a statewide health plan that delivers customized asthma programs for teenagers. This plan is part of Centene, a Medicaid MCO serving 19 states. Almost 20% of the teenagers in Peach State have an asthma diagnosis. This plan delivers stratified asthma management services that include health coaches, and environmental, medical, and social interventions in clinics, *home settings*, and in schools. There are low, moderate, and high risk levels in the stratification. The high-risk group, which includes about 700 members per year, receive telephonic and mail outreach, *as well as home visits*.

Using clinical and financial data, the plan modeled the health improvements and cost savings. Compared to a control group, the teens in the program had 9% fewer respiratory-related unplanned health care utilization incidences and a shorter average length of stay when inpatient care did occur. Those participating in the program were also more likely to make a planned visit to a primary care physician and to receive recommended flu vaccines. Peak flow meter use and controller medication use both improved at higher rates for program participants compared to the control group. The program saved approximately \$320 per member per month.²⁴

²³National Environmental Leadership Award in Asthma Management.http://www.epa.gov/asthma/award_winners.html#peach

²⁴http://www.epa.gov/asthma/award_winners.html#peach

Contracting with Integrated Delivery Systems

GHHI should also explore contracting directly with hospital systems and integrated delivery systems. This would be a particularly good approach in Maryland where virtually all of the state's 46 hospitals are now under a global revenue cap as part of the new All-Payer Model Design. A very substantial portion of these hospitals are now a part of three major systems, Johns Hopkins Medicine (JHM), the University of Maryland Medical System (UMMS), and MedStar. Thus, GHHI could approach any or all of these systems. Other opportunities could emerge with Holy Cross Health, Frederick Memorial Hospital, Western Maryland, Bon Secours, and Mercy hospitals.

One approach could involve a partnership with Johns Hopkins J-CHiP program. JHM developed J-CHiP as a community-based program focusing on care coordination. This program serves 1,000 patients in Priority Partners, a Johns Hopkins health plan, and 2,000 fee-for-service Medicare patients at high-risk for emergency department use and inpatient hospital admissions. The hospital system works with its ambulatory and community care clinics within seven zip codes around Johns Hopkins Hospital (JHH) and Johns Hopkins Bayview Medical Center (JHBMC).

A key focus of the program is on care coordination in primary care settings for patients with chronic diseases and behavioral health conditions. Components include medication management, patient-family education, and post-acute transitions. JHM received a three-year, \$19.9 million grant from the Center for Medicare and Medicaid Innovation (CMMI) to support this community program.²⁵

GHHI could help J-CHiP identify asthma patients in these seven zip codes in Baltimore who would benefit from home visits. It might also be possible to work with both JHM and Mercy Hospital, which is also in downtown Baltimore, on a collaborative program for high-risk asthma patients.

The Use of Medicaid Waivers

Section 1115 waivers provide a considerable amount of flexibility in adopting pilot approaches such as the GHHI model. This creates a compelling case to work with GHHI for the numerous states with 1115 waivers in place. As noted above, this waiver approach should not be thought of as purely an alternative to State Plan Amendments and Targeted Case Management. Multnomah County and the State of Oregon have used all three mechanisms to support the asthma home visits in that county.

Massachusetts has been conducting a pilot project under an 1115 waiver from CMS aimed at improving health outcomes and lowering spending for high-risk children ages 2 to 18. CMS approved a request from Massachusetts in December 2011 to extend its 1115 waiver to develop a new pediatric asthma pilot program that aims to reduce ED use and hospitalizations for this population. Under this demonstration, a portion of bundled or global payments can be used to reimburse expenses necessary to manage the illnesses of these children, including patient education, environmental assessments, mitigation of triggers, and the purchase of durable medical equipment.²⁶

²⁵<http://urbanhealth.jhu.edu/J-CHIP/>

²⁶http://www.slideshare.net/ARC_NE/massachusetts-bundled-payment-program-presented-by-katharine-london

Another option is Section 1915 (c) home and community based waivers and Section 1915 (i) State Plan Amendment Home and Community Based Services benefits. Services under these waivers can be medical or non-medical in home and community-based settings.

EPSDT

EPSDT services have traditionally been reimbursed within the context of a well-child physician office visit. But the type of health education and assessment envisioned under this program does not have to be delivered in a clinical setting. Any practitioner licensed by the state could be qualified to provide EPSDT services, and CMS encourages EPSDT programs to coordinate with a broad range of social service programs. As noted earlier, it may be required that services are initially recommended by a physician or other licensed practitioner. EPSDT services can be provided in a home, school, or community location.²⁷

Payment Models

This section presents four payment approaches for GHHI services: (1) fee-for-service payments; (2) per-visit fees; (3) bundled payments; and (4) global payments. An over-arching approach that could complement and enhance any of these approaches involves an effort to examine existing funding sources that are mainly of a “one-time” nature, supplant them where possible with sustainable funding, and attempt to shift that funding to other components that are harder to fund.

Fee-for-Service payments

Under this approach, GHHI would develop separate fees for each element of its home visits, and payers would fund their portion of each visit. For example, one payment could be for the following services: assessments, care plan development, referrals, linkages and coordination of services.

Another payment could be for supplies. This might include vacuum cleaners, encasements, and green cleaning kits. A third payment could be for weatherization service, while another fee could be charged for removing mold. Alternatively, there could be one payment for a few of these remediation services involving home repairs.

Fixed fee per visit

This payment strategy involves one flat fee paid to GHHI for a home visit. It would be negotiated with a payer and would not be “itemized.” For example, GHHI and a payer might agree to a fee of \$600 or \$700 for each home visit. For some home visits, this would amount to an under-payment for what is actually done, as in the cases of more complicated home situations requiring considerable remediation of asthma triggers identified. Yet, in other cases, the fixed payment could exceed the actual cost, as when the solution to a patient’s problem is rather straightforward.

Under either of these approaches, a key element will be the careful and detailed documentation of all of the elements of GHHI costs. This includes the percent of each person’s time who participates in the home visit that is allocated to various tasks. So if a person on the team doing the home visit spent 40% of her time during that home visit on assessment and the development of an individualized care plan,

²⁷42 CFR Section 440.130 c 78 Federal Register 4594. January 22, 2013.

that proportion should be documented. Further, there should be an allocation of administrative staff time, on a pro-rata basis. In other words, the payment should incorporate some allocation of at least some of the elements of GHHI overhead costs, including staff supervision and transportation costs.

Generally speaking, supplies such as encasements, fans, and vents will not be covered under this fixed fee arrangement, nor will the important repairs be covered. But if the fees are successfully negotiated to cover the “fully loaded” cost of the work force conducting the home visits, this will take some pressure off the budgets of providers and perhaps “cross-subsidize” some portion of the cost of supplies and repairs.

Thus, under this strategy, the fees are determined by taking total program costs, backing out non-billable elements of this total such as supplies, and dividing the remainder by the number of visits. This approach has been used successfully in Multnomah County, Oregon.

This strategy means that the negotiated fee for a home visit would be less than the actual cost for some visits and more than the actual cost for other visits. For example, some visits might last only 30 minutes while others last for two to three hours.

Of course, GHHI would continue to serve all in need. But one drawback of this approach is that some other providers might be incentivized under this payment mechanism to search out patients with less complex needs.

Braiding sustainable funding sources from county, city, and state general funds

This approach involves using new funding, mainly from Medicaid through TCM, SPAs, or waivers, to cover services that fit within those payer’s frameworks (i.e., assessment, care plan development, and referrals) to cover some of the costs that were previously covered under a grant from HUD or a city or county housing grant, and then working with these funders to redirect a portion of their funding to other activities that previously fell outside the scope of their grant.

This braiding approach to sustainable funding, explained earlier, could be used as a supportive tool under any of the payment structures presented here such as fee-for-service or bundled payments.

For example, a group such as GHHI may be already working with the Baltimore city housing agency, a Maryland Housing agency, and the US Department of HUD. If a TCM program were initiated with State and CMS participation, and the TCM program covered assessments, care plans, and referrals, this could free up some funding under those housing agency grants to cover such key activities as purchasing more vents and fans, trash hauling, and additional home repairs.

The importance of credentials

Under any of these strategies, an important feature of obtaining adequate payment is to ensure that all staff members obtain some type of key credentials recognized in the field. This does not mean *clinical credentials*. Instead, the concept is for staff serving as CHWs or asthma educators to obtain the type of training and credentials *in their fields* that will help justify the payments for their work.

For example, the Stanford Chronic Disease Self-Management Program is built on the principles of self-management, community-based self-education, community health workers, and an empowerment philosophy. Full training covers a four- to five-day period. Workshop activities are identical to the

activities taught to people with chronic diseases when programs are offered in the community. Trainees are asked to act as people with chronic diseases in a class and to experience the activities just as regular people would when they attend workshop activities in their communities. These sessions are interactive and dynamic.²⁸

The Multnomah County Healthy Homes project has been arranging for both community health workers and environmental health workers to get these certifications. Program leadership believes that this has both improved the quality of their work and been helpful in obtaining reimbursement for their services. Multnomah County is also working with the National Asthma Educator Certification Board (NAECB) to certify their asthma educators. NAECB provides content, questions and answers, and validation of experience, and they update their materials annually, fostering both certification and re-certification.²⁹

If CHWs do not have this type of training, then reimbursement may hinge on requirements that these CHWs work under the guidance of a nurse or an environmental health specialist, who must “sign off” on their notes and recommendations. A nurse may be required to “co-sign” on the charting of the patients. This type of training frees and enables the CHWs to work more independently and will help in obtaining reimbursement for their services.

Bundled payment

Another approach to paying for GHHI home visits involves bundled payments. Under this approach, payment would be determined by the cost of a suite of visits necessary to get the patient’s home assessed and reassessed as necessary, as well as ensuring supplies delivered and home repairs completed.

Under the bundled payment approach, payers and providers would agree upon financial and performance accountability for services provided during an episode of care. It links payments for multiple services into one bundle, rather than fee-for-service payments for each service.

Recognizing the wide variation in the needs of each household and asthma patient, it should still be possible to determine an “average number of visits per household,” including reassessments and repairs. Let’s assume that is four visits. Further, let’s assume that the average cost per visit is \$800 (this will be further discussed below in our ROI section). In this case, the bundled payment would be \$3,200. That would be what GHHI is paid regardless of the number of visits.

Global payments

A more sweeping departure from current fee-for-service practices would be a complete change from a fee-for-service approach to a global payment strategy.

Under global payments, providers would receive a set amount per month to cover all health services delivered to a patient population over a period such as one year. An average cost of meeting patients’ needs in the home setting would be calculated, in the fashion of per member per month, or “PMPM” payments that a State would pay managed care organizations under Medicaid.

²⁸ <http://patienteducation.stanford.edu/training/Introduction%20to%20Stanford%20Trainings%20for%20Participants.pdf>

²⁹ <http://www.naecb.com/mission-goals.php>

Global payments could also be used with hospitals or integrated delivery systems such as ACOs. In arrangements such as the new All-Payer system in Maryland in which hospitals are fully at risk for excessive spending, and stand to realize savings from efficiencies and reduced spending, there will be a new incentive to contract with and reimburse GHHI and similar organizations. GHHI services will help the provider systems get good results and bonus payments or awards under their risk-sharing arrangements.

These approaches would be most useful, and likely to include GHHI, if they included both the normal GHHI initiatives and some clinical services that could be provided in a home setting. This might include medication management, checking peak flow rate, review of inhaler techniques, and teaching patient self-management.

Another element on the clinical side involves spirometry devices. There are now Smart Phone Apps that enable patients to test their breathing ability at home, and the results can be directly transmitted to a nurse or other clinician. *It is important to note that adding such elements as this, where clinically indicated, to a home visit, could help get a payment for that visit that might otherwise prove difficult to obtain, and it would be good for patient health as well.*

In effect, these clinical check-ups in a home setting could be bundled with the work that GHHI is already doing in its assessment, supplies, and repairs, all into one annual global payment per patient.

Building incentives for quality and outcomes into payment structures

GHHI could enter into bonus payment arrangements for achieving certain quality and outcome goals that could be used under bundled and global payment arrangements.

One approach is to establish gain-sharing arrangements if certain targets are met regarding reductions in ED and inpatient use. While it would be difficult to determine a cause-and-effect relationship, a bonus could be received if it can be shown that utilization of asthma patients in these high-cost settings went down in some period such as six months or a year following the home interventions. GHHI has information now indicating reductions in ED use (28%) and hospitalizations (66%) for the patients where home visits and repairs were made.³⁰ This is based on self-reported information from the families.

When Medicaid participation is secured, it will be possible to obtain Medicaid claims data and conduct a study of the actual, as opposed to self-reported, utilization patterns of asthma patients' use of health services. Ideally, a study could be set up comparing the ED use, physician services use, prescription drug fills and refills, and inpatient and outpatient hospital use of asthma patients who have had home visits, compared to those with similar characteristics and diagnoses who have not had these visits. This would be done on a de-identified basis to ensure privacy. This type of study would help us understand the impact of GHHI interventions on patient utilization, independent of other factors that may also affect such use. GHHI has a Healthy Homes Technical Study underway that uses this research methodology, directed by Professor David Salkever at the University of Maryland, Baltimore campus, and Dr. Elizabeth Matsui at Johns Hopkins Health System.

³⁰ Norton, Ruth Ann and Brown, Brendan Wade. Green & Healthy Homes Initiative: Improving Health, Economic, and Social Outcomes Through Integrated Housing Intervention. Environmental Justice. December 2014, 7(6): 151-157. <http://online.liebertpub.com/doi/full/10.1089/env.2014.0033>

Here is one example of how a reward system could be structured. Suppose a payer agrees to a specified fee-for-service payment for a GHHI visit, or a bundled payment for a suite of visits, as discussed above. Then a schedule of bonus payments could be added onto these amounts if ED use and inpatient admissions for asthma patients decline at hospitals in the catchment area where these patients would likely go for care (e.g. patients who would be likely to go to the ED, observation units, or be admitted to Johns Hopkins and Mercy hospitals in east Baltimore, for example).

If ED use by patients with asthma as a primary diagnosis fell by 1-5% over a period such as a year, then something like 5% could be added to the per visit fee, or to the bundled payment. Similarly, if ED use fell by 6-10%, the fee per visit would be increased by 10% or the bundled payment increased by 10%. Larger reductions in ED use would trigger proportionately larger bonus add-ons to the fees and bundled payments. For global payment arrangements, the PMPM would be increased in a commensurate fashion.

A similar bonus arrangement could be established for reductions in inpatient use by patients whose primary diagnosis is asthma. These bonuses could be larger, because the savings to the payers would be much larger.

Payment bonuses could also be tied to meeting quality metrics established by organizations such as the Joint Commission, the National Quality Forum, and AHRQ. The Joint Commission uses three measures:

1. Percentage of inpatient asthmatics administered relievers (CAC-1)
2. Percentage of inpatient asthmatics administered systemic corticosteroids (CAC-2)
3. Percentage of inpatient asthmatics discharged with a Home Management Plan of Care (CAC-3)³¹

An important challenge is to develop a set of quality indicators that are not hospital-centric and relate more directly to GHHI work. A check list of key assessment measures could be developed from the experience that GHHI has with home interventions. That check list could include such items as:

- Determining how many times a child's asthma kept a parent home from work and/or a student home from school.
- A careful assessment of whether anyone in the household suffers from asthma, allergies, frequent ear infections, chronic bronchitis, hay fever, eye irritations, sinus problems, etc.
- Assessment of whether there is mold inside the home and exactly where it is found.
- Assessment of evidence of flooding as well as water condensation on walls, windows, ceiling, floor.
- Looking for signs of tobacco smoking inside the home.
- Examination for pets and related problems.
- Thorough search for pests (mice, rats, bedbugs, etc.).
- Review for asbestos materials and radon.
- Heating, venting, sanitation checks.

Goals could be established regarding the achievement of all of these (and other) key elements of a home assessment, followed up quickly with individualized plans of action. Then a bonus plan would build on hitting related targets. For example, if organizations such as GHHI completed 90% or more of

³¹<http://www.qualitymeasures.ahrq.gov/expert/expert-commentary.aspx?id=45026>

the items on the test list for at least X number of home visits (e.g. 100 or more), and provided evidence of action plans completed within a specified period, they would get an increase in their contractual fee of 10%. A higher bonus could be arranged for 95% or more success, and so on.

Auto assignment

Another reward system involves the use of auto-assignment algorithms that reward health plans demonstrating that they have the ability to well manage certain patient populations such as children or adults with asthma. Those plans would then have a direct incentive to work with GHHI. It seems likely that the auto-assignment algorithm would not be limited just to asthma improvement, but perhaps to a cluster of quality indicators, for example, several related to children's health, including asthma management.

For example, a Medicaid program working with three MCOs might under normal practices assign new members who do not select an MCO to these organizations on a basis that each one gets one-third of these enrollees. Medicaid could alter this even distribution of auto-assignments so that the MCOs that meet targets related to asthma outcomes get a somewhat greater number of new enrollees. For example, if an MCO demonstrates reductions exceeding a certain percentage in ED use and/or inpatient admissions for patients with a primary diagnosis of asthma, then they would get more than a third of the new enrollees. One system might add three percentage points to the roughly 33% of new enrollees received under auto-assignment for each one percentage point reduction in asthma-related ED visits. Thus, if an MCO demonstrated that such ED visits related to asthma fell by 3% over a specified period of say one year, then in the following year it would receive a 9 percentage point increase in its share of new auto-assigned enrollees, from 33% to 41%.

MCOs could then set up their own gain-sharing arrangements with groups such as GHHI. The MCOs would have a clear incentive to pay for GHHI services. In this way, the gain-sharing first goes from Medicaid to the MCO, and then from the MCO to GHHI.

The Business Case for GHHI projects

Evidence of cost savings from asthma home visits

A number of studies published in peer-reviewed journals demonstrate that the cost of pediatric asthma ED visits is very substantial, and that home interventions to mitigate asthma triggers lead to substantial savings. A number of studies show a very positive ROI. A study conducted for the CDC found that there were 629,000 ED visits for pediatric asthma for Medicaid and CHIP enrollees in 2010, at a cost of \$272 million.

Two published articles in the American Journal of Preventive Medicine present a systematic review of home-based, multi-trigger multicomponent interventions with an environmental focus. These studies report the effectiveness of the interventions in reducing asthma morbidity among children and

adolescents. The interventions feature home visits by trained personnel to assess the level of and reduce the effects of indoor environmental pollutants.³²

A comprehensive review of many studies conducted by Nurmagambetov and colleagues culled 13 studies from a search of 1,551 studies that met the criteria of the analysis. To be included in this review, the studies needed to be primary research, and interventions had to include at least one home visit, target two or more indoor asthma triggers, and include two or more intervention components, at least one of which had to be an activity directed at improving the indoor environment for a person with asthma. To be classified as a multicomponent, an intervention needed to consist of two or more of the following components: environmental remediation, environmental education, self-management education, general asthma education, improved access to social services, and coordinated care. Program costs were reported for all of these 13 studies.

The benefit/cost ratios ranged from 5.3 to 14.0. This shows that for every dollar spent on the intervention, the monetary value of the resulting benefits, such as averted medical costs or averted productivity losses, was \$5.30 to \$14.00 (in 2007 US dollars). The range in incremental cost-effectiveness ratios (ICERs) was \$12-\$57 per asthma symptom-free day (SFD). In other words, these interventions achieved each additional symptom-free day for net costs of \$12 to \$57.³³ It is important to note that for children, a symptom-free day is likely to be a day they can go to school rather than stay home, and for an adult, a day that they can go to work, rather than stay home.

A study of the Boston Children's Hospital Community Asthma Initiative identified 283 children in four urban, low-income zip codes in Boston through logs of ED visits or hospitalizations. A nurse case manager reviewed daily, weekly, and monthly admission and ED logs for patients with the diagnosis codes for asthma. Patients were prioritized to be in greatest need of services because of a hospitalization or multiple ED visits during the past year. Nurse case managers provided face-to-face visits during hospitalizations or through telephone contact, and offered case management services and home interventions. Hospital administrative data were used to assess ED visits and hospitalizations, at enrollment, and one and two years after enrollment. Hospital costs were compared with hospital costs of a neighboring community with similar demographics.³⁴

The following results were recorded:

1. Asthma-related ED visits fell by 66.5% after six months, 68.0 at 12 months, and 56.0 for those with any follow-up.
2. Asthma-related hospitalizations fell by 79.7% at six months, 84.8% at 12 months, and 82.6% for those with any follow-up.

³²Nurmagambetov, T, Barnett, S, Verughese, J, Chattopadhyay, S, et al. Economic value of home-base, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity. *American Journal of Preventive Medicine*. Vol. 41, Issue 2, Supplement 1: S33-S47. August 2011.

³³Nurmagambetov et al. supra.

³⁴Woods ER, Baumik U, Sommer SJ, Ziniel, S. et al. Community asthma initiative: evaluation of a quality improvement program for comprehensive asthma care. *Pediatrics* Vol. 129, No. 3. March 2012.

3. Any days of limitations in physical activities fell by 50.4%, 42.6%, and 38.7% for the corresponding time periods.
4. The incidence of patients missing school decreased by 44.9%, 41.0%, and 42.3%, respectively.
5. The incidence of parents missing work declined by 53.2%, 49.7%, and 47.7%, respectively.³⁵
6. Patients with the greatest functional impairment from ED visits, limitation of activity, and missed school were more likely to have any home visits and a greater number of home visits.
7. There was a significant reduction in total hospital spending compared with the comparison community.³⁶
8. The cost of the program was \$2,529 per child. The savings in medical costs for the intervention group were \$3,827 per child. The ROI was 1.46.³⁷

A review of the evidence base conducted by Adam Atherly of the University of Colorado found a wide variation in the cost of asthma home interventions, which explained much of the variation in the benefit/cost ratios. This variance in program costs, according to Atherly, was largely explained by the type of provider used, and the author concludes that using higher-cost professionals (e.g. physicians, nurses) did not lead to proportionately more effective outcomes. Some of the studies indicated a degree of slippage in symptom-free days beyond the first year after the intervention. But Atherly concludes that “if the benefits of home interventions persist over several years, even relatively small decreases in health expenditures may be sufficient for the program to be cost-neutral.” He suggests that follow-up programs may be effective in sustaining the benefits of the initial interventions.³⁸

These results are consistent with the findings of an actuarial analysis provided to the Green & Healthy Homes initiative by Milliman, Inc. The analysis, prepared by Gary L. Brace, used population and claims data to prepare estimates of utilization savings, associated with each medical service category, expected to be experienced during a three-year period for home interventions for asthma such as those provided by GHHI. Certain types of medical admissions for GHHI’s aligned population were identified as avoidable and the per capita utilization rates of those types of admissions were reduced to reflect effective care management and home hazard reduction techniques. The Milliman analysis found a positive ROI associated with GHHI’s work.³⁹ The Milliman analysis is a simulation based on numerous studies and using various data sources, rather than an evaluation of an actual program.

The bottom line is that a number of carefully conducted evaluations have found that home interventions for people with asthma are found to have a value that far exceeds the costs. This can be seen in benefit/cost analyses, where the benefits consistently exceed the costs, leading to a positive ROI; and in cost-effectiveness studies, where the costs per good outcome achieved, such as symptom-free days, are found to be small.

³⁵ All P<.0001

³⁶ P<.0001

³⁷ Woods, ER, Bhaumik U. et al. Supra.

³⁸ Adam J. Atherly. The economic value of home asthma interventions. *American Journal of Preventive Medicine*. Vol. 41, Issue 2, Supplement 1: S-59-S61. August 2011.

³⁹ Gary L. Brace. Actuarial Memorandum for Green & Healthy Homes Initiative GHHI Asthma Intervention Model.

Extending the analytic framework

To this point, our analysis has focused on two types of savings: first, and of critical importance: savings in medical costs; and second, savings associated with such outcomes as reducing missed school days and work days by care givers. These savings usually occur in a framework of one to three years. In this section, we broaden the framework to look beyond this window to more of a life-cycle approach that takes a longer look at the potential benefits of the types of interventions conducted by GHHI.

A more comprehensive view of the business case for GHHI is that smart investments in controlling asthma along with other chronic medical diseases will reduce absenteeism and improve labor productivity over a lifetime.

A large number of Americans with one and frequently multiple chronic illnesses that are not well managed are either not working or are working below their productive capacity.

In this context, allowing children and adults to be sidelined with serious chronic illnesses such as asthma is not only bad public health—it is also bad economics. In the demographic era we have now entered, with a swelling elderly population, low labor force participation, and sub-par productivity, we can ill afford to leave people outside of our economy looking in rather than as active participants.

Similarly, we need to take a lifetime approach to realizing and recognizing the benefits of successful programs such as those operated by GHHI. When a child with asthma who has been repeatedly sick and missing school days, and performing below ability in school, gets a “new lease on life” from GHHI home interventions and follow-up, this does not just save money in the year in which the services are delivered. Reduced school absenteeism and better performance in school will yield a steady stream of benefits over a lifetime—in the form of better health, increased labor market success and higher earnings. Similarly, when home interventions for adults with asthma are successful, this can lead to both reductions in public benefit costs, such as disability insurance (OASDI) and Unemployment Insurance, and higher earnings. More productive citizens means public benefit costs go down, tax collections go up, without raising anyone’s tax rates—and some of the “economic dividends” can be reinvested, multiplying the favorable effects.

We are spending a huge amount of money to remediate or alleviate health problems that could be avoided with proper community-based interventions. GHHI, and organizations providing similar services, should be seen as a key component of a much-needed strategy to address the underlying forces driving people into the health care system. Instead of viewing these interventions as “add-ons” to the medical system, they should be seen as investments with a real payoff resulting from both lowering spending inside the medical system and favorable effects outside that system—better school attendance, reduced school drop-out rates, employment opportunities, reduced work absenteeism, and higher labor productivity.

Investments that reduce ED visits and hospital costs will lower insurance premiums, and this will improve labor market outcomes and lower federal and state health spending

The type of results presented above showing that home interventions for children with asthma will reduce ED visits and inpatient admissions should translate, over time, into somewhat lower health

insurance premiums, other things being equal. Even slight reductions in insurance premiums have important favorable effects that are important to explain.

While a set of interventions aimed at a specific disease state or population, by themselves, may not have a large impact on premiums, if the US makes a series of investments in this type of initiative that directly affect the forces driving people into the health care system, the combined impact of such investments could be sizeable. The analysis below assumes that a cluster of such investments that lower the use of high-cost care, mostly hospital care, can have an appreciable downward impact on health insurance premiums.

A decline in premiums and costs to both self-insured employers and private health insurers will have two favorable effects. First, employers, particularly small firms, have been shifting the cost of health coverage to their employees, and a reduction in premium increases could be expected to reduce the size of this employer-to-employee cost shift. This effect includes both lower employee premium contributions and lower out-of-pocket outlays (e.g. deductibles, co-payments, coinsurance, and penalties for out-of-network use). In response, some employees who would otherwise have turned down insurance will accept an offer of health coverage from their employer because they are more able to afford their share of the cost. Thus, fewer will be uninsured, and fewer will go to the Marketplace or Medicaid for coverage. This will reduce federal and state spending.

Second, the decline in premiums will have some favorable effect on the trend in recent years in which small firms have been dropping coverage, and it will also lead to fewer job losses. A study by Harvard University health economists Katherine Baicker and Amitabh Chandra found that every 10% increase in health insurance costs reduces the chance of being employed by 1.6%. It also reduces hours worked by 1% as employers respond to rising health costs by converting full-time jobs to part-time jobs. Many of these part-time jobs do not provide health coverage. Furthermore, the authors found that higher health insurance premiums for employers come out of the wages and salaries of employees—a 10% increase in health insurance premiums leads to a 2.3% reduction in wages.⁴⁰

A key finding from the Baicker/Chandra study is that lower-wage, hourly workers are particularly vulnerable to loss of employer coverage because employers are legally constrained by how much they can reduce the wages of these workers (e.g. due to the minimum wage). For workers earning low wages, the authors find that a 10% increase in employer premiums will result in a 3.8% reduction in the probability of being offered health coverage.

Dana Goldman at the University of Southern California and co-authors also found that rising health insurance premiums are forcing many employees who want to retain health coverage to surrender both income and benefits. The authors found that two-thirds of a premium increase is “paid for” with wage reductions while one-third from a reduction in benefits. A number of employees shifted from more comprehensive coverage to catastrophic coverage, leaving them vulnerable to large out-of-pocket

⁴⁰Katherine Baicker and Amitabh Chandra. “Effects of Rising Health Insurance Premiums.” National Bureau of Economic Research. Working Paper No. 11160. <http://www.nber.org/digest/aug05/w11063.html>

health costs.⁴¹ Another study by David Cutler and Neeraj Sood, looking at the impact of a decline in health insurance premiums, as opposed to an increase, found that a 6% reduction in health insurance premiums nationwide would lead to 200,000 new jobs in manufacturing and 900,000 new jobs in services.⁴²

Examining these findings to assess the impact of lower premiums, we have three effects of a decrease in premiums in the private sector: (1) fewer employers will drop coverage for all their workers; (2) fewer employers will shift some or all of their workers from full-time to part-time positions, where in most cases, this shift would have led to a loss of eligibility for employer-sponsored insurance; and (3) a reduction in premiums will lead to an increase in wages. The bottom line is job gains, wage increases, and lower out-of-pocket health spending for workers. These are important indirect positive effects on our economy arising from some reduction in the upward pressure on health insurance premiums.

Reduced federal and state spending

As a result of these favorable developments in the labor market and employer coverage, federal and state health care spending will be lower. The most significant federal savings would occur in Medicare, most directly observed in Maryland under the new version of the All-Payer Model Design where lower medical costs lead to reductions in spending for all payers, not just a cost shift.

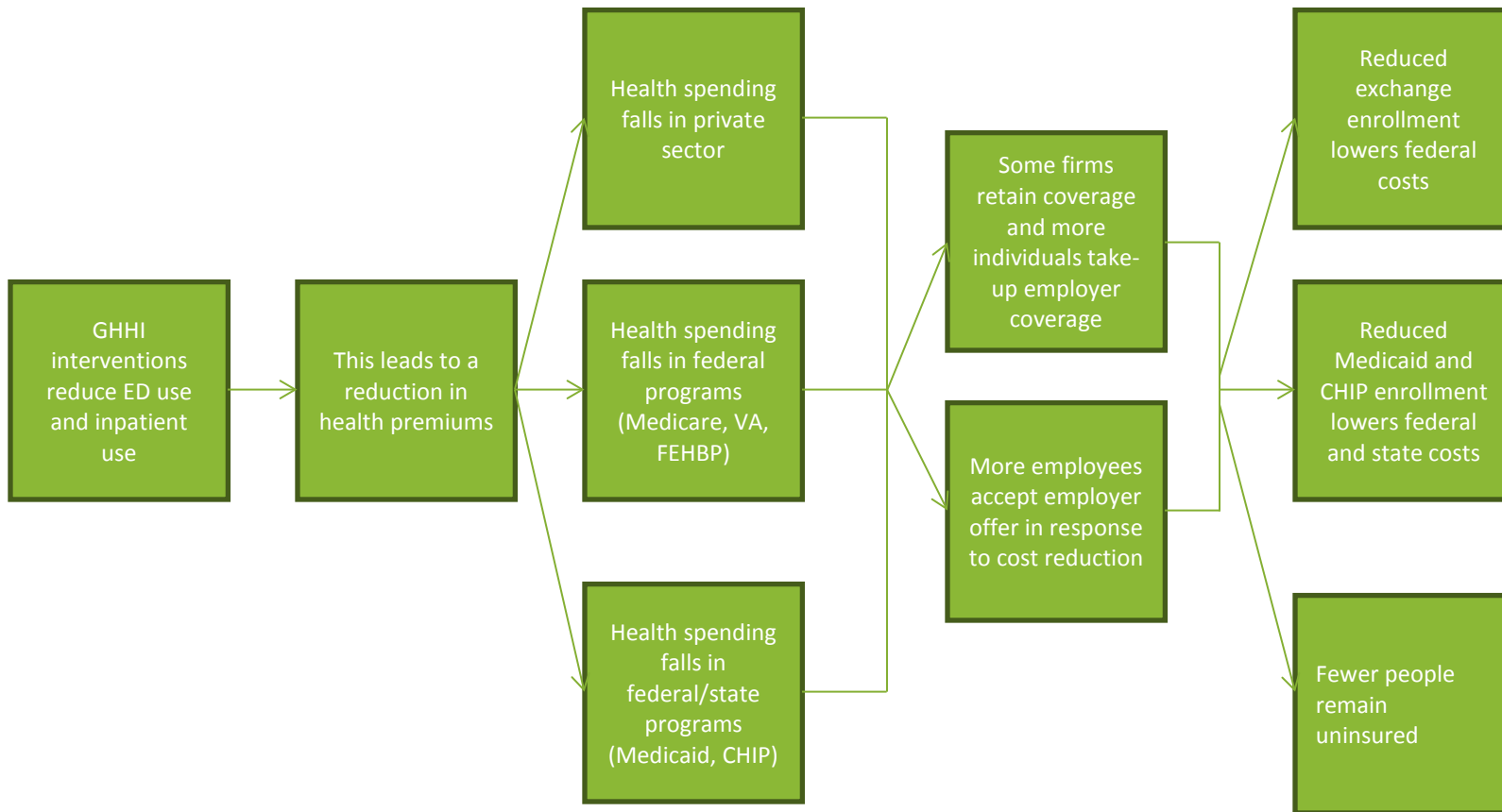
In addition, there would be savings in the Federal Employees Health Benefits program. Federal savings would also appear in reduced outlays for Unemployment Insurance (UI), the Tri Care program, and the Veterans Administration programs.

The chart below illustrates the chain of positive, economy-wide impacts that flow from a reduction in premiums that can be achieved when smart investments lead to lower health care spending.

⁴¹Dana Goldman, NeerajSood, and Arleen Leibowitz.National Bureau of Economic Research. Working Paper No. 11063.

⁴²David Cutler and NeerajSood. “New Jobs Through Better Health Care.” Center for American Progress. January 2010.

http://www.americanprogress.org/wp-content/uploads/issues/2010/01/pdf/health_care_jobs.pdf



For children, success in controlling a chronic condition such as asthma will lead to better academic achievement. In turn, this will improve labor market success in later years. Evaluations of other types of help for children, such as Head Start, have shown that when a full range of benefits over a long time period is taken into account, the investments made show a positive payoff. While we cannot quantify many of these benefits, we can include them in the analysis, and in some cases, offer an approximate estimate of the magnitude.

These kinds of benefits are rarely assessed or even mentioned in most benefit/cost analyses. But identifying them is part of making the “business case” for GHHI. There will be savings for all levels of government—federal, state, and local, and for business and labor, over and above the health care savings.

Some skeptics might ask whether it is realistic to contemplate health care premium savings of any significant magnitude, such as 3% or 5%. To put this in perspective, and to realize how feasible it is if we change our mindset away from the “bricks and mortar” and high-tech approach to medical spending toward prudent investments in prevention, we need only to examine how much wasteful spending we have now inside the walls of our health care system.

A 2012 study by the Institute of Medicine estimated that top-quality care throughout the US could result in 75,000 fewer deaths, and *that an estimated \$750 billion in care that is wasteful and produces no significant positive health benefits could have been avoided in 2009.*⁴³ Waste includes spending on health services that lack evidence of producing better health outcomes compared to less-expensive alternatives; inefficiencies in the provision of health care goods and services; and costs incurred while treating avoidable medical injuries, such as preventable infections in hospitals.⁴⁴ We have the knowledge to reduce wasteful and cost-ineffective medical spending while at the same time improving quality of care and improving population health.

Thus, part of the business case for GHHI interventions is to illustrate how communities can develop comprehensive plans that reduce outlays on facilities, services, and products that lack a clinical evidence base, and redeploy funding into lower-cost, higher-payoff investments in community-based interventions that *do have an evidence base*.

An in-depth community needs assessment can help make the business case

Part of the business case for GHHI is to help communities (cities, counties) understand the importance of conducting an in-depth community needs assessment (CNA). This type of exercise can determine many areas where a community is *under-spending to address serious unmet public health needs* as well as areas where communities are *over-spending in a way that leads to excessive and redundant capacity*. The goal is to set the stage for redeploying resources from the latter to the former.

⁴³Institute of Medicine. “Best care at lower cost: the path to continuously learning health care in America.” September 6, 2012. The estimate of \$750 billion in annual waste is comprised of: \$210 billion in unnecessary services; \$190 billion in excess administrative costs; \$130 billion in inefficiently delivered services; \$105 billion in prices that are too high; \$75 billion in fraud; and \$55 billion in missed prevention opportunities. http://www.nap.edu/download.php?record_id=13444.

⁴⁴Health Policy Brief. *Health Affairs* December 13, 2012. http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_82.pdf

A useful CNA would analyze population, demographic and socioeconomic data for relevant county, town and sub-town areas from national data sources, such as the Census Bureau's *American Factfinder* and *American Community Survey*, highlighting the distribution of population characteristics, such as age, race, income, disability status, insurance status, educational attainment and other characteristics. The *American Community Survey* provides access to decennial census data, as well as estimates for national, state, county, town and sub-town data. A community can use state and local data to describe characteristics of the Medicaid and uninsured populations, highlighting health disparities of sub-groups within these populations. They can also obtain data on professional shortage areas, mortality and morbidity, and data from the Behavioral Risk Factors Surveillance Survey (BRFSS). Health Management Associates has developed a health needs assessment data tool that uses some of these data sets and takes what is frequently state-level or county-level data down to the zip code level based on demographics.

Understanding the gaps between needs and resources from a variety of perspectives—including FQHCs and other community health centers, local housing agencies, food banks, other providers and community-based organizations and partners, fragile and high-risk populations, and other stakeholders—will better ensure the appropriate selection, design, and implementation projects that collectively will close identified gaps and help reduce avoidable ED visits and hospital use.

A gap analysis will create an inventory of available community and health care resources, and use geo-mapping and hot-spotting to identify the extent to which existing health resources match up with population needs. This mapping may show, for example, that the patients with high health care needs, including asthma patients who are using care in high-cost settings repeatedly, tend to be concentrated in one set of neighborhoods while clinics, urgent care centers, and other providers tend to be concentrated in a very different part of the region. The analysis may also uncover transportation and language barriers that make it very difficult to access primary care facilities that accept Medicaid and uninsured populations, the need for more supported or transitional housing, better access to oral health care, or the need for more substance abuse treatment centers and community mental health centers. Based on the findings of a gap analysis, communities can develop specific strategies to bridge the gaps between needs and resources. GHHI interventions could be an important strategic component.

This analysis will also highlight areas where community resources are being wasted. This may involve duplication in funding streams, programs that are not working as intended, and excess capacity in various types of facilities. *Redeploying funding from areas of excess capacity or poor performance to areas where a community is under-investing can improve health outcomes while lowering total spending. This helps make the "business case" for GHHI—it is not simply an "add-on" to the current system, but rather an important component of a community-wide plan to spend available resources more wisely.*

Conclusions and Policy Implications

Home interventions for children with asthma can improve patients' health and successfully lower health care spending. These interventions also lead to more active and regular participation in school for children with asthma and fewer absences from work for adults who are either asthma patients or caregivers for children.

The door is now open to gain Medicaid participation in paying for home interventions for asthma patients. This may occur through direct Medicaid reimbursement under such programs as targeted case management. It may also occur through contractual arrangements with Medicaid managed care organizations.

Home interventions for asthma patients are part of a new way of thinking in health policy. In addition to the traditional focus only on reorganizing the health care delivery and financing systems, we must also move upstream to address the underlying forces that drive people into the health care system in the first place. GHHI activities are part of a larger thrust of making smart investments in community-based interventions frequently provided by people without clinical training that can help avert expensive treatment in high-cost medical settings.

About the Green & Healthy Homes Initiative

The Green & Healthy Homes Initiative® (GHHI®) is a national nonprofit dedicated to breaking the link between unhealthy housing and unhealthy residents. Formerly known as the Coalition to End Childhood Lead Poisoning, GHHI replaces stand-alone housing intervention programs with an integrated, whole-house approach that produces sustainable green, healthy and safe homes. As a result, we are improving health, economic and social outcomes for families across the country. GHHI serves as the national model for green and healthy homes interventions and is currently working in 21 cities.

We work directly with state, county and city governments to establish designated GHHI sites and implement the GHHI service model. With years of experience across a wide variety of governance structures and funding sources, we help align existing programs from federal agencies, foundations and private sector entities. We bring together funding streams that support the gamut of home intervention work conducted by city agencies, nonprofits and housing contractors, and coordinate the activities of organizations that provide home services. GHHI has a well-earned reputation for delivering quality services to at-risk communities, developing innovative models for healthy homes policies and programs and providing effective technical assistance.

Learn more at www.ghhi.org or follow us [@HealthyHousing](https://twitter.com/HealthyHousing). If you are interested in becoming a GHHI site or receiving technical assistance, please contact President & CEO Ruth Ann Norton at ranorton@ghhi.org or 410-534-6477.