National Center for HEALTHY HOUSING

Milken Institute School of Public Health
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Community Health Workers: Delivering Home-Based Asthma Services

INTRODUCTION

While individuals with asthma receive a majority of needed care in a clinical setting, evidence-based guidelines from the National Asthma Education Prevention Program (NAEPP) recommend that home-based asthma interventions, including environmental assessments and self-management education, be delivered in conjunction with clinical care.[1] Community health workers (CHWs) are especially well equipped to deliver these home-based asthma services.

Community health workers are laypersons working to support health in the community. The American Public Health Association defines a CHW as a "[f]rontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served."[2] In some states, CHWs are further defined by distinct roles and requirements for training and continuing education.[3]

The relationships that CHWs have with their communities allow them to serve as an important link between the clinical and social sectors. For example, in the case of home-based asthma services, a CHW from a patient's neighborhood or a CHW with a shared cultural background may be viewed as more trustworthy than a clinical provider from outside the community. In addition, CHWs may better understand the language, cultural norms, and health beliefs and practices of those they serve, including their common home and herbal remedies. This shared sense of community may encourage a family to allow a CHW into their home to conduct an environmental assessment that can proactively mitigate asthma triggers. A family may also be more receptive to education on environmental trigger reduction delivered by a CHW who resides in the community they serve.

These interventions are not only effective, but can also be cost-saving. Studies have demonstrated a positive return on investment (ROI) for home-based asthma interventions focused on children and adolescents,[4, 5, 6] and adults with asthma.[7, 8] There is also emerging evidence of the potential for a positive ROI from CHW-led home-based asthma interventions.[9, 10, 11, 12, 13]

Preventive Services Rule

A Medicaid regulatory change – known informally as the preventive services rule change – made it easier for Medicaid to reimburse CHWs and other nonlicensed care providers for preventive services provided in home and community settings.[14] Previously, only preventive services that were provided by a physician or other licensed practitioner (OLP) could be reimbursed by Medicaid. By adopting the preventive services rule change, states can allow for Medicaid reimbursement of preventive services provided by other practitioners, as long as these services are *recommended* by a physician or OLP.[15]

The preventive services rule change means that state Medicaid programs have more flexibility to pay for preventive services, such as home-based asthma interventions, delivered by CHWs and other providers that may fall outside of a state's clinical licensure system.

This means that state Medicaid programs have more flexibility to pay for preventive services, such as home-based asthma interventions, delivered by CHWs and other providers that may fall outside of a state's clinical licensure system. This rule change has prompted some states to begin exploring the role of CHWs in their healthcare systems and has the potential to increase the overall number of CHWs in the workforce. To implement this rule change, states must submit a state plan amendment (SPA), which outlines what services will be covered and who will provide them, to the Centers for Medicare and Medicaid Services (CMS).[16] For more information about this process, please see the NCHH case study titled *Advancing the role of community health workers*.

This document describes the current role of CHWs in home-based asthma programs, the range of services delivered, and financing mechanisms used to support this work. In addition, this paper provides examples of home-based asthma programs in the field, and offers recommendations for stakeholders to advance the role of CHWs in the delivery of home-based asthma services.

RANGE OF HOME-BASED ASTHMA SERVICES

Home-based asthma services, including remediation of triggers in the home and asthma self-management education, have demonstrated positive health outcomes,[17, 18, 19, 20] as well as improvements in costly asthma co-morbidities.[21, 22, 23, 24] The Centers for Disease Control and Prevention's (CDC) Community Preventive Services Task Force recommends the use of home-based, multi-trigger, multicomponent interventions with an environmental focus for children and adolescents with asthma to improve overall quality of life and productivity, improve asthma symptoms, and reduce exposure to multiple indoor asthma triggers.[25] The evidence base in support of home-based asthma services for adults has also grown significantly over the past decade.[26, 27, 28, 29]

By engaging individuals in the home, where most of the day-to-day management of asthma happens, CHWs help uncover and address the factors contributing to an individual's asthma status. Their work may address environmental factors, through home assessments and improvements, as well as nonenvironmental factors, including training and education to improve asthma self-management.

Environmental Services

Home Assessments

Home environments, especially in communities where asthma is prevalent, are often the source of numerous asthma triggers.[30] Studies have shown that certain factors – most commonly dust mites, pets, cockroaches, rodents, and mold, as well as irritants such as environmental tobacco smoke and indoor air pollutants – are strongly associated with poor asthma control.[31, 32]

CHWs may conduct a range of activities to assess a home environment, including resident interviews and visual assessments of the home and neighborhood to identify, address, and educate patients about potential triggers or trigger-promoting conditions.[33]

Trigger Reduction

Once identified through interviews and home assessments, triggers and trigger-promoting conditions may be addressed directly. Generally speaking, addressing the health and environment of an asthma patient involves a team of individuals, each contributing distinct skills and experience. As part of such a team, CHWs may:

- Educate individuals and families about asthma triggers and green cleaning methods (e.g., using low-volatile organic compound [VOC] products) and integrated pest management (e.g., cleaning surfaces and setting traps);[34, 35]
- Provide individuals with supplies to reduce triggers, such as HEPA vacuums, green cleaning supplies, gel baits, mattress encasements, and food storage containers;[36, 37]
- Connect individuals to important repair services (e.g., to fix leaky pipes and/or cracks in floors and walls; improve poor ventilation);[38] and
- Provide other services, as needed.

Certain technical environmental services, such as pest extermination or remediation of moisture sources in cases of severe mold, may require a specialist in addition to the CHW.[39, 40] In these cases, CHWs can help individuals by making referrals to the professionals best suited to address the specific situation.[41]

Environmental Education

Often conducted concurrently with environmental assessments, CHWs can help reinforce clinical care by educating individuals about how the home environment can impact asthma symptoms.[42, 43, 44, 45] Such services include working with patients to develop a plan to reduce and avoid exposure to identified asthma triggers, and/or providing health resources.[46] With this education, individuals are empowered to undertake trigger-reduction activities, which can lead to clinically measurable health improvements among children[47, 48, 49] and improved health and quality of life among adults.[50, 51]

Nonenvironmental Services

Care Coordination

CHWs can enhance clinical care by collecting information about an individual's home environment and communicating that information to the individual's provider or other members of the asthma care team.[52] Notably, research has found that CHWs add value to the care that clinical nurses provide.[53, 54] For example, CHWs may communicate with nurses or other clinical providers by sending home-visit reports about issues that may impact a patient's care.[55, 56]

Social Services and Support

CHWs can help individuals access additional resources that may be necessary for the individual to truly gain control of their asthma. In this capacity, CHWs use techniques such as motivational interviewing to identify and address the barriers an individual is facing.[57] For example, during home visits, CHWs can encourage individuals to utilize online patient portals to communicate with their providers, tackle comorbidities through tobacco cessation and exercise, and gather information to address their asthma more successfully.[58]

CHWs can use this information to serve as a bridge to medical, social, and housing services.[59] To the extent that individuals need help navigating asthma triggers and barriers to care in their environment, CHWs are well positioned to provide guidance and linkages to local services such as interpreter services, legal support, tobacco cessation services, or transportation assistance. Such work may be particularly important for low-income, minority, and elderly communities.[60, 61, 62]

ASTHMA CAREPARTNERS SINAI URBAN HEALTH INSTITUTE

The Sinai Urban Health Institute (SUHI), the research arm of Sinai Health System of Chicago, has conducted extensive research on CHW home-based asthma interventions for children since its initial pilot program began in 2000.[63] SUHI has since implemented and evaluated seven CHW home-based asthma programs, including three ongoing initiatives.[64]

A current initiative is Asthma CarePartners: a comprehensive home-based asthma program in which CHWs provide environmental assessments and education on asthma self-management and environmental triggers to children and adults with asthma. The program is based on existing models developed by SUHI that have demonstrated success.[65]

Program participants include privately insured individuals, through a partnership with Blue Cross Blue Shield of Illinois, as well as individuals in Medicaid, through the Family Health Network (a Medicaid MCO). The program consists of a year-long "active phase" that includes six home visits, a home assessment, environmental and self-management education, and referrals to social service organizations, as needed, as well as monthly phone calls. After the active phase, participants move into a maintenance phase of six months where home visits and phone calls may be reduced or continued depending on participant needs. Preliminary data shows fewer ED visits and hospitalizations, and an improvement in asthma control and medication usage.[66]

Self-Management Education

As CHWs are able to develop familiar connections with their patients, they are well positioned to help empower patients and/or their caretakers to manage asthma symptoms proactively. Working in homes allows CHWs to educate individuals about the day-to-day actions that individuals can take to manage their asthma more effectively.[67] Asthma self-management enables individuals to use asthma-control medicines and equipment correctly, recognize triggers and early symptoms of an asthma episode, and respond appropriately.

Asthma self-management skills that a CHW may teach include how to:

- Follow an asthma action plan,[68]
- Improve medication adherence (e.g., proper inhaler technique),[69]
- Store medication properly, and
- Use and navigate the healthcare system effectively.[70]

The skills involved with teaching asthma self-management require significant training of any team member, including CHWs. As the first state to develop a standard curriculum for CHWs, Minnesota recommends continuing education of CHWs that include competencies addressing specific health issues, including asthma.[72, 73] States may increasingly define the training and continuing education required for licensed CHWs, as well as the specific role they play within larger healthcare teams, as they begin to allow for Medicaid reimbursement of CHWs.

Research has shown that CHW self-management education may be most effective when paired with clinical reinforcement. For example, a CHW-led home-based asthma program in Chicago where CHWs provided self-management education but had no connection to clinical providers was unsuccessful in reducing asthma symptoms.[74] The results from the intervention suggest that home-based asthma programs are likely to be more successful with a clear connection to a clinical provider. In particular, some education may be most effective if first provided by or under the supervision of another team member (e.g., a nurse or physician) and later reinforced by a CHW.

SEATTLE-KING COUNTY HEALTHY HOMES II PROJECT

The Seattle-King County Healthy Homes II Project (2001-2006) included services delivered by CHWs in conjunction with nurses. While nurses provided clinical asthma education, CHWs provided self-management education, care coordination with clinical staff, and social support. In addition, participants received home environmental assessments and resources to reduce asthma triggers.

After each home visit, CHWs sent home visit reports to nurses and communicated with them directly about the patient's condition and issues that might impact care.

The intervention led to improved health outcomes, including greater degrees of asthma severity and control, and 24 additional symptom-free days per year. Additionally, the intervention resulted in modest increases in caretaker quality of life across race/ethnic groups, and higher levels of educational attainment in children of all ages.[71]

RANGE OF FINANCING MECHANISMS

Medicaid

As described above, states must submit a state plan amendment (SPA) to adopt the new flexibility provided through the preventive services rule change and to reimburse CHWs for delivering preventive services, such as home-based asthma services. For example, Missouri received approval of a SPA in 2016 to reimburse for home-based asthma services, including in-home environmental assessments and education.[75, 76] The services must receive prior authorization and be originally recommended by a physician, but may be provided by nonlicensed practitioners with specified credentials, which would include CHWs.[77, 78] The California state legislature passed legislation that would have allowed the state to submit a SPA to reimburse CHWs for the delivery of home-based asthma services; however, the bill was vetoed by Governor Jerry Brown in October 2017.[79, 80] Governor Brown, in a statement, explained that he vetoed the bill because the California Department of Health Care Services "has considerable authority to make changes to benefits based upon new medical evidence and clinical guidelines" and felt that statutory changes were unnecessary.[81]

According to the National Academy for State Health Policy (NASHP), Minnesota[82] has also submitted a SPA to allow for the reimbursement of preventive services by CHWs, but does not reimburse for asthma services.[83, 84] Other states that are considering similar SPAs, such as Delaware, present an opportunity to secure better Medicaid funding for these services.

In addition, other mechanisms have been implemented to finance CHWs for the delivery of home-based asthma services, such as through Medicaid managed care organizations (MCOs), Medicaid health homes, and Medicaid waivers. The NASHP State Community Health Worker Models tab, "CHW Roles in State," provides a link to its 2017 survey of strategies states have used to fund asthma and lead poisoning prevention CHW home visits waivers.[85]

Medicaid Managed Care Organizations

Most state Medicaid programs contract with managed care organizations (MCOs), which provide coverage for the majority of Medicaid enrollees in many states. MCOs have discretion to hire or contract with CHWs to provide home-based asthma services using their administrative budgets, even if a state Medicaid program does not reimburse for the service or if CHWs fall outside of a state's clinical licensure system.[86] For example, MCOs in the District of Columbia contract with a community-based organization to provide home-based asthma services delivered by CHWs for high-risk children with asthma.[87] In addition, MCOs in Louisiana employ CHWs directly.[88]

Medicaid Health Homes

The Affordable Care Act (ACA) created an option for states to create Medicaid health homes, which allow states to offer comprehensive care coordination to individuals with one or more chronic conditions, including asthma.[89] Medicaid health homes provide and coordinate all patient care, including a specific set of "health home" services, such as comprehensive care management and referrals to community and social support services.[90] To implement a health home, states must submit a SPA to CMS.

Nine states have established Medicaid health homes that include asthma as an eligible condition.[91] However, whether these states include nontraditional providers and home-based asthma services depends on how they define eligible health home providers and settings. For example, Maine's health home includes Community Care Teams (CCT), which are multidisciplinary teams that explicitly list CHWs as team members.[92] Maine also requires CCT providers to "visit patients in their homes to perform medication reconciliation and assessments," which would allow CHWs to deliver asthma services in home settings.[93]

Medicaid 1115 Waivers

Another way to finance CHWs to deliver home-based asthma services is through Medicaid 1115 waivers. Medicaid waivers allow states to waive certain Medicaid rules to test new ways of delivery and payment for healthcare services, including those not typically covered by Medicaid.[94]

In January 2017, Oregon renewed an 1115 waiver to continue operating coordinated care organizations (CCOs).[98] CCOs are local networks of healthcare providers, including CHWs, who work together under global payments from the state, giving the CCO flexibility to innovate and improve chronic conditions like asthma. By explicitly requiring care teams to include "non-traditional healthcare workers" like CHWs that deliver preventive services in home and community settings, Oregon has expanded the use of CHWs.[99]

NEW YORK STATE HEALTHY NEIGHBORHOODS PROGRAM

The state-funded New York State Healthy Neighborhoods Program intervention funded 13 counties to provide home-based asthma interventions to high-risk populations.[95] These areas were determined by greatest need (e.g., older housing).

Participants in the intervention received home assessments, environmental education, and tools and resources to remediate asthma triggers or related problems. Those with the most serious conditions were revisited and reassessed three to six months later.[96]

The intervention resulted in improved health and environmental outcomes among adult and child participants. It also produced an estimated ROI of $2.03 for every dollar invested for all individuals with asthma and $3.58 for every dollar invested for those with more poorly controlled asthma.[97]

Other Funding Mechanisms

In addition to Medicaid, a wide range of other sources can be leveraged to help finance CHW-led home-based asthma interventions, including funding from state or local governments, hospital and healthcare systems, private philanthropy, and community-based organizations.

Government Funding

Grants from various local, state, and federal agencies are a common way to fund CHW-led initiatives like home-based asthma programs. According to a survey conducted by NASHP, states have reported receiving grants for home-based asthma initiatives from the Centers for Disease Control and Prevention, and the

THE COMMUNITY ASTHMA INITIATIVE (CAI) – BOSTON CHILDREN'S HOSPITAL

To address the prevalence of childhood asthma in Boston, MA, including the disproportionate effect on black and Hispanic children, the Boston Children's Hospital implemented a model of care in which culturally-competent, bilingual, and bicultural CHWs and nurses provide home-based asthma interventions with a focus on environmental services.[100] The program has received funding from various sources, including hospital community benefit funds, federal grants, and philanthropic organizations.[101, 102]

Through home visits, CHWs and nurses provide home environmental assessments and remediation, environmental and self-management education, integrated pest management materials and referrals, as needed, and education on smoking cessation for parents and caretakers.[103] A 2017 study found that the intervention decreased costly hospital and ED visits and resulted in a ROI of $1.91 per dollar invested over five years.[104] The model has since been adopted, replicated, and adapted for other cities and states.[105]

Health Resources and Services Administration (HRSA), among other federal agencies.[106] Some states also provide special funding for home-based asthma services, including Massachusetts, Montana, New Jersey, and New York.[107]

Hospitals and Healthcare Systems

In addition to MCOs, hospitals and healthcare systems that serve primarily low-income populations have hired CHWs to expand their ability to work with individuals in home and community settings. These investments are often cost effective.[108] For example, the Boston Children's Hospital Community Asthma Initiative (CAI), described in detail below, provides home-based asthma interventions with a focus on environmental services. Results of the program suggest the intervention produces a positive return on investment by reducing the hospital and emergency department (ED) visits among children enrolled in the program.[109]

Private Philanthropy and Community-Based Organizations

CHWs may be funded to deliver home-based asthma services through private philanthropy and community-based organizations.[110] While often small in scale, many organizations have seen success with their efforts. For example, City Health Works, a nonprofit organization in New York, places CHWs at the forefront of their program. The program delivers home-based education services for individuals with various chronic conditions, including asthma.[111] Fifty percent of providers report having benefited from early detection of a medical issue identified by a CHW that was otherwise unknown to the provider.[112]

RECOMMENDATIONS FOR STAKEHOLDERS

As described previously, CHWs can play a unique and important role in providing a range of home-based asthma services. In order to maximize the full potential of CHWs in the delivery of home-based asthma services, stakeholders and community-based organizations can consider multiple approaches to advancing their role, such as:

- Support Sustainable Funding through Medicaid. As noted earlier, to reimburse CHWs, a state Medicaid program must submit a SPA to CMS. Stakeholders can work with their state Medicaid office to educate and engage them on the importance of submitting a SPA to CMS for this purpose. States may also consider developing 1115 waivers or Medicaid health homes focused on asthma.
- Encourage Medicaid MCOs to Fund CHWs with Administrative Dollars. MCOs can use administrative dollars to fund CHWs to deliver home-based asthma services. Stakeholders can reach out to the medical officers or other leadership of health plans to explore opportunities.
- Encourage State Medicaid Offices to Amend Contracts with MCOs. State Medicaid offices can use their contracts with MCOs to promote the uptake of CHWs. State Medicaid offices can establish a minimum ratio of CHWs to beneficiaries, and establish a required list of services, such as home-based asthma services, that CHWs must provide.[113]

- Encourage States to Establish Standards for CHW Training and Certification. As they integrate CHWs their healthcare systems, it is increasingly important that states to establish systems that provide standardized training and certify CHWs. For example, as part of its standard CHW requirements, Minnesota requires a practice-based internship that can be completed with an asthma care team, and recommends continuing education of CHWs about competencies related to specific health issues, including asthma.[114] Because it is so important that CHW possess skills in asthma treatment and management, there may be a need for supplemental training opportunities and requirements for CHWs working in this space.
- Leverage Private-Sector Funding Opportunities. There are many opportunities to finance CHWs through private-sector resources including through hospitals and healthcare systems, private philanthropy, and community-based organizations. For example, hospital community benefit programs may serve as an important source of financing for CHWs.[115] As described above, the Boston Children's Hospital Community Asthma Initiative has received support from community benefit funds.[116]
- Educate on the Need for Further Research. The evidence base demonstrating the effectiveness of CHWs is still emerging, and the evidence specific to the delivery of home-based asthma interventions, especially for adults, is limited but growing. Stakeholders and community-based organizations can encourage additional funding from both government and the private sector for research on CHWs and home-based asthma services.

CONCLUSION

CHWs play a vital role in the delivery of home-based asthma services. CHWs bridge cultural and linguistic barriers, expand access to coverage and care, and improve health outcomes.

ADDITIONAL RESOURCES

For additional information, see:

Healthy Housing Solutions' National Healthy Homes Training Center and Network:
http://healthyhousingsolutions.com/hhtc/

National Center for Healthy Housing's "Healthcare Financing of Healthy Homes" resource library:
http://nchh.org/tools-and-data/financing-and-funding/healthcare-financing/

Association of State and Territorial Health Officials' "Community Health Workers" page:
http://www.astho.org/community-health-workers/

National Academy for State Health Policy Community Health Workers in the Wake of Health Care Reform: Considerations for State and Federal Policymakers:
https://nashp.org/wp-content/uploads/2015/12/CHW1.pdf

Rural Health Information Hub's "Community Health Workers Toolkit":
https://www.ruralhealthinfo.org/toolkits/community-health-workers

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ACRONYMS

ACA	***Affordable Care Act***
CAI	***Boston Children's Hospital Community Asthma Initiative***
CCT	***Community Care Team***
CCO	***Coordinated Care Organization***
CDC	***Centers for Disease Control and Prevention***
CHW	***Community Health Worker***
CMS	***Centers for Medicare and Medicaid Services***
DHCS	***Department of Health Care Services***
ED	***Emergency Department***
HRSA	***Health Resources and Services Administration***
MCO	***Managed Care Organization***
NAEPP	***National Asthma Education Prevention Program***
NASHP	***National Academy for State Health Policy***
OLP	***Other Licensed Practitioner***
ROI	***Return on Investment***
SPA	***State Plan Amendment***
SUHI	***Sinai Urban Health Institute***

DEFINITIONS

Community health worker (CHW)
The American Public Health Association defines a CHW as "a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery." For the full definition, visit
https://www.apha.org/apha-communities/member-sections/community-health-workers

Home-based asthma services
This case study uses the *Community Guide to Preventive Services* definition of home-based, multitrigger, multicomponent asthma interventions. These interventions typically involve trained personnel making one or more home visits, and include a focus on reducing exposures to a range of asthma triggers (allergens and irritants) through environmental assessment, education, and/or remediation. For the full definition, visit
https://www.thecommunityguide.org/sites/default/files/assets/Asthma-Home-Based-Children.pdf

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