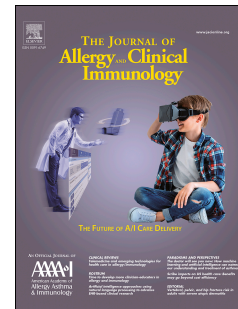


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Housing and Asthma Disparities

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Housing and Asthma Disparities

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Abstract

The burden of asthma disproportionately affects minority and low-income communities, resulting in racial and socioeconomic disparities in asthma prevalence, exacerbations, and asthma-related death. Social determinants of health are increasingly implicated as root causes of disparities and healthy housing is perhaps the most critical social determinant in asthma health disparities. In many minority communities, poor housing conditions and value are a legacy of historical policies and practices imbued with structural racism, including redlining, displacement, and exclusionary zoning. As a result, poor quality, substandard housing is a characteristic feature of many underrepresented minority communities. Consequently, structurally deficient housing stock cultivates home environments rife with indoor asthma triggers. In this review we consider the historical context of urban housing policies and practices and how this contributed to the substandard housing conditions for many minority children in the present day. We describe the impact of poor housing quality on asthma and interventions that have attempted to mitigate its influence on asthma symptoms and healthcare utilization. We discuss the need to promote asthma health equity by reinvesting in these neighborhoods and communities to provide healthy housing.

Capsule Summary

This paper discusses the historical context and the current state of housing disparities, how that fosters asthma disparities, and ways to promote asthma health equity by improving housing conditions.

Key words: asthma, housing, disparities, structural racism, social determinants of health

List of abbreviations

CHOP- Children's Hospital of Philadelphia

BUILD- Build Health Challenge Grant

CAPP- Community Asthma Prevention Program

CHW- Community Health Worker

ED- Emergency Department

CDC- Centers for Disease Control and Prevention

HUD- U.S. Department of Housing and Urban Development

RTP- Rebuilding Together Philadelphia

H4H- Habitat for Humanity Philadelphia

HVAC- Heating, ventilation and air conditioning

Introduction

In the US, there are 5.1 million children with asthma, making it the most common chronic physical condition of childhood.¹ Although in recent decades advancements in medical therapy have contributed to an overall reduction in asthma morbidity and mortality, racial, ethnic, and socioeconomic disparities persist for asthma outcomes, including rates of asthma-related death, hospitalization, and emergency room visits.² The burden of asthma symptoms – sleep disturbance, activity limitation, and missed days of school and work – is disproportionately represented in underrepresented minority communities.^{3, 4, 5} To better understand and address asthma disparities, researchers, clinicians, and policymakers have increasingly turned to the role of social determinants of health. Although healthcare access remains important, other factors account for a substantial portion of health outcomes.⁶

For asthma disparities, perhaps none of these social determinants are as critical as housing. A landmark Institute of Medicine report established that exposure to indoor allergens such as mold, cockroach, mouse, and dust mite allergens is common in substandard housing.⁷ The overall level of disrepair in the home, particularly in low-income, urban communities is an important determinant of the presence of environmental asthma allergens.⁸ In this paper, we will highlight studies linking indoor aeroallergens, housing conditions, and asthma outcomes, as well as interventions aimed at modifying allergen exposure and the structural housing components that give rise to these exposures, including early results of a major structural repairs intervention we conducted. First, however, we highlight the critical historical context that gave rise to racial and ethnic inequities in housing quality and neighborhood investment, as expectations for solutions to housing-mediated asthma disparities must be bound by a candid understanding of their complex causes.

The Critical Context of History and Structural Racism

Racial disparities in housing value and quality are downstream results of systemic and structural racism. There are several detailed accounts of how structural racism became a feature of US housing practices and policy.^{9, 10} An in-depth discussion of this complex history is beyond the scope of this article, however, several key practices and policies are germane to understanding current racial disparities in housing value and quality in the US. These include “redlining”, a real estate practice of ranking non-White neighborhoods as credit-unworthy, which became codified in the federal housing policy in the 1930-1960s through the Home Owner’s Loan Corporation and Federal Housing Authority (FHA).¹¹ These federal organizations were designed to promote home-ownership to low income individuals by providing refinancing assistance and underwriting mortgage risk, but because of the explicit use of race and ethnicity data, only 2% of FHA mortgage insurance was available to non-white families.¹² Another practice, exclusionary land-use zoning based on race and ethnicity was determined unconstitutional in 1917, but continued through the practice of zoning white, wealthy neighborhoods as exclusively single-family and low-density preventing the inclusion of multi-unit buildings with affordable rent for low-income communities of color.¹³ Though the Fair Housing Act of 1968 rendered these practices illegal, they created segregated neighborhoods in which residents were systematically denied mortgages on the basis of race. As a result, entire neighborhoods predominantly occupied by minorities were denied access to home ownership, a key component of multigenerational wealth building.¹¹

The ongoing effects of exclusionary housing practices and their long-term economic consequences for residents are still felt in neighborhoods characterized by poor quality, substandard, *unhealthy* housing. Greater housing deprivation leads to poor health and sustained housing deprivation increases the probability of poor health as adults.¹⁴ Historical oppressive housing practices have further resulted in limited housing choices for Black and Hispanic families.¹¹ Homeowners in these neighborhoods often have lower-paying jobs or less opportunity for better-paying jobs, resulting in limited income which impairs their ability to maintain homes.¹⁵ Blacks are twice as likely to experience the burden of housing hardship- the ability of households to afford basic living needs and housing expenses.^{11, 16} The hardship of maintaining older homes results in defects in the building envelope leading to conditions in the home which promote problems with pests, leaking roof or ceiling, plumbing problems, holes or cracks in the walls or ceiling and large dangerous holes in the floor.¹⁷ Caregivers in low-income, struggle to provide healthy housing. Healthy housing, a basic necessity, is a dream for the poor and yet essential in promoting equitable asthma outcomes.

Impact of Poor Housing Quality on Asthma

In-home asthma triggers

Exposure to indoor allergens is the direct pathway by which poor housing quality may affect asthma.¹⁸ Early childhood exposure and sensitization to allergens found in substandard housing results in increased risk of incident asthma among those who are genetically predisposed.¹⁹ Continued exposure to allergens may exacerbate asthma symptoms and increase ongoing risk of asthma morbidity even after adjusting for age, sex, race, and ethnicity.^{20, 21} In inner city children, exposure and sensitization to multiple asthma triggers has been associated with asthma severity.^{21, 22} By one estimate, elimination of all identified residential risk factors for asthma would result in a 39% decrease in asthma in the United States.²³

Pests such as cockroaches and rodents, more likely to be found in substandard housing, present a risk for children with asthma.²⁴ Children with asthma who had been sensitized to mouse allergen are at increased risk of unscheduled physician visits, ED visits, and hospitalizations when exposed to mouse allergens in the home.²⁵ Similarly, there is a dose response between exposure to cockroach antigen and asthma exacerbations.^{22, 26} Dust mites present in house dust can exacerbate asthma symptoms.^{27, 28} Finally, mold is a common in-home allergen associated with asthma exacerbations. Infants exposed to high concentrations of mold species common among water-damaged buildings were more likely to have asthma when they reached school age.²³

Housing conditions and asthma triggers

A pooled analysis of nine studies examined the relationship between housing conditions and the presence of asthma allergens.²⁹ In homes that had not been actively maintained, common structural issues facilitate allergen exposure. Water intrusion, which can stem from plumbing leaks, roof leaks, and unventilated or damp basements, may lead to mold development and attract pests. Cracks and holes in the walls, below average housekeeping, and water leaks were positively associated with cockroach allergen. Housing built prior to 1951 was associated with elevated dust mite levels. Additionally, homes with basements or crawl spaces predicted

increased allergens in the home. Carpet in older homes carry a large load of house dust which can lead to exposures to dust mite, pet dander and pests.³⁰

Low-income households may face differing challenges in eliminating asthma allergens from the home. While homeowners have autonomy in maintaining their home, the cost burden of improvements may make it difficult for low-income homeowners to conduct repairs to address structural deficiencies that facilitate asthma triggers. Renters are less able to control the repairs in their homes and landlords may not be aware of the impact of housing conditions on residents' asthma control.^{31, 32} Finally, when public housing is occupied by transient residents, it is more likely to have poorer-quality management and upkeep, resulting in conditions that facilitate the presence of asthma triggers.³³

Levels of Intervention

Interventions aimed at reducing exposures to asthma triggers occur at three levels of intensiveness and investment: (1) multi-trigger, multicomponent interventions, (2) single, targeted structural repairs, and (3) major structural repairs.

Multi-trigger, multicomponent interventions

The CDC task force on Community Preventive Services recommends home-based, multicomponent, multi-trigger reduction interventions as an effective way to improve quality of life for children and adolescents with asthma.³⁴ Except for pests such as cockroach and mice, targeting a single asthma trigger with environmental mitigation does not appear to be effective in improving asthma outcomes.³⁵ Therefore, interventions for reducing common triggers such as dust, cockroach, mice, and mold require a multipronged approach. House dust mite can be reduced through multicomponent intervention including removal of carpet, mattress and pillow covers, and targeted cleaning strategies. Cockroach and mice allergens can be reduced through integrated pest management which includes cleaning, exclusion practices (filling holes), traps and non-toxic pest bait.³⁶ Mold allergen presence requires better ventilation, dehumidifiers and repair of leaks. Studies which use skin testing to target areas of intervention and a more general approach of reducing common asthma triggers in the home with community health workers have been shown to be both efficacious in reducing asthma exacerbations and overall effective.³⁷⁻³⁹

Single, targeted structural repairs

Single intervention home repairs aimed at root causes of moisture damage, poor heating and poor ventilation for children with asthma show some promise in reducing the presence of asthma triggers, though generally do not address all asthma triggers in the home. In a pilot study of 72 children with asthma who lived in damp housing, interventions included gas central heating units in 47%, electric heaters in 37% and solid fuel central heating in 12%. All respiratory symptoms improved but nocturnal cough improved significantly from 3 to 1 night each month.⁴⁰ In another study insulating homes led to self-reported improvement in symptoms, and reduced sick visits and missed work and schooldays.^{41, 42} In a tailored package which combined both ventilation and heating, self-reported physical functioning improved amongst children with moderate to severe asthma.⁴³ Moisture reduction through targeted home repairs in addition to behavior interventions has also been associated with modestly improved asthma outcomes.⁴⁴

Major structural repairs

Few studies have addressed comprehensive structural interventions aimed at root causes of a compromised building envelope and internal structural deficiencies, likely due to the expense of such an approach.⁴⁴⁻⁴⁶ However, it is the logical next step, given the linkage between poor housing conditions and asthma outcomes. In the Breathe Easy Homes intervention, Takaro and colleagues moved 34 renter families into new homes with added asthma- friendly elements including moisture proof exteriors, heat-exchange ventilation systems with filtration and continuous fresh air supply, and low emission, low dust accumulation interior finishes, in addition to being built with both energy efficient and sustainable products. In comparing the asthma outcomes of children who lived in those homes to children who did not, they found that nighttime symptoms improvement was similar to outcomes from 1 year of inhaled corticosteroid use in improving symptom free days.⁴⁵ Gruber and colleagues enrolled 42 families who were a combination of homeowners and renters.⁴⁷ The HUD healthy home assessment (adapted for asthma triggers) was used at baseline to determine need for home structural and behavioral interventions. The repairs were prioritized to address mold and pest issues first, then heating, ventilation and dust next, which included the repair of heaters and ventilation and creation of vapor barriers and carpet removal. Findings included reduced symptoms, improved quality of life and reduced costs for hospitalizations.⁴⁶

A New Program Model: Linking Multi-trigger Interventions with Major Structural Repairs in Philadelphia

Philadelphia is characterized by older rowhomes built at the turn of the 20th century. Our program, the Community Asthma Prevention Program (CAPP) utilizes a community-based approach to implement asthma education and asthma trigger remediation interventions in homes. In the past twenty years, we have conducted over 20,000 home asthma education and trigger remediation visits for children with asthma. Unfortunately, due to the age of the homes and the consequences of historical redlining in Philadelphia, homeowners cannot always maintain their homes, limiting their ability to reduce asthma trigger exposure. Community Health Workers (CHW) are often struck by gaping holes in walls and ceilings, improper ventilation, old and worn carpeting and visible mold, all not addressed by our original interventions (see Box 1). For this reason, CAPP sought partners to expand in-home interventions to include structural repairs. With funding provided by our health system and the BUILD initiative, we partnered with two home repair agencies, Rebuilding Together Philadelphia (RTP) and Habitat for Humanity Philadelphia (H4H), to implement major structural repairs for homes in order to reduce the presence of in-home asthma allergens.

Sarah, a single mom and homeowner living in West Philadelphia balances work, parenting, and homeownership, all in addition to managing the health of a child with a chronic disease—asthma. In the year prior to enrollment in the Community Asthma Prevention Program (CAPP) home visiting program, her four-year-old daughter visited urgent care once and the emergency room three times, all for severe asthma exacerbations. As part of CAPP, she received in-home asthma education from her daughter's home visitor, along with trigger-mitigating supplies including mattress/pillow covers, asthma-friendly cleaning materials, roach bait and mouse traps, and a new spacer and mask. Still she had structural issues that the home visitor could not address. Fortunately, since she is a homeowner, she was eligible for the Children's Hospital of Philadelphia's CAPP+ Home Repairs program, where substantial structural home repairs were completed to further reduce asthma triggers caused by mold/mildew, pests, and dust. Sarah was thrilled by the opportunity to make an even bigger impact on her child's health by having long-overdue repairs completed in her home: "As a homeowner in West Philadelphia, repairs on a home are very, very hard, especially being a single mother."

Despite several months of delays due to the pandemic, since construction's completion, her daughter's asthma has remained under control and exacerbation-free, not requiring a single emergency room visit or hospitalization. Repairs to Sarah's home included a new roof, an exhaust fan over the cooktop to remove nitrous oxide, new vinyl-plank flooring replacing wall-to-wall carpeting in several rooms including her daughter's bedroom, and a bathroom fan, clothes dryer vent to outside, and dehumidifier to reduce moisture throughout the house. Sarah is extremely grateful that her daughter's health has so significantly benefited from both the asthma education and the home repairs – "I'm just really excited and really happy about my repairs and am so, so happy about my new house now."

Families meeting the eligibility requirements of being a homeowner living in West Philadelphia and child enrolled in CAPP (eligible if child has 1 asthma-related hospital visit or 2 emergency visits in past year) were offered CAPP+ home repairs by RTP or H4H. Once identified, the housing repair agency conducted the initial inspection, created a work scope, reviewed that work scope with the homeowner and assigned contractors to the job. Figure 1 illustrates how all partners were connected in implementing home repairs for children with asthma (Figure 1). The repairs focused on dust, mold, and pests (Figure 2) and outcomes were number of repairs completed and number of repairs needed, reduction in number of triggers, and reduction in asthma symptoms and healthcare utilization.

Demographics and living conditions

We enrolled 30 homeowners with the first cohort. Homeowners were primarily African American living with children who were between 2- 17 years of age (table I). According to CHWs observation at the initial home visit, only 25% of the child's bedrooms were in good condition and less than 20% of the general living conditions were rated as good.

Home Repairs for Asthma Triggers

Most repairs identified at baseline were targeted to reduce pests, moisture and dust (Table II). Repairs made to eliminate pests were primarily exclusionary in focus. For mold, repairs were made to eliminate sources of water intrusion and provide adequate ventilation.— For dust, removing sources of dust in living area and child's bedroom were the most common repairs (Figure 1, 2). Parents reported a reduction in cockroaches, mice and evidence of mold (Table III) at the 12- 18 month post-repair survey.

Asthma Symptoms and Health care utilization (Table IIIa-b)

Self-reported symptoms were used as a proxy for asthma control. The 12-month post repair questionnaire reveals a nearly 50% reduction in nighttime symptoms, 40% reduction in rescue medication use and a 60% reduction in missed school days, all of which indicate improved asthma control. Approximately 90% had an inpatient and/or emergency visit in the year prior to enrolling in CAPP home visits. At 12 months, emergency and hospital room visits decreased by approximately 90%.

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Homeowner Feedback

In general, homeowners were grateful for the repairs offered (see Box 2), although some were disappointed that other major home repairs (not asthma-trigger related) could not be completed due to budget restraints

Box 2. Qualitative feedback from homeowners

"Everything is really good. They just completed the basement steps. One person has to come out and change address sign on the front. A lot of back and forth towards the end. But everybody was friendly, in and out, kept areas clean. Other than that, totally happy with the bathroom. Likes to just sit in the bathroom. I thank you for referring to the program, can focus on other little things. (She can focus on smaller repairs since the biggest repairs were taken care of). We love Courtney (CHW)."

"No more wheezing now. Everything is feeling good. Every month I'd go to the hospital. But now, everything is perfect. No more. They are taking their medications. They are doing good. Not like before. They helped me a lot for my kids."

"A lot of things on the list they did not get to because of the cost of other repairs. My expectations were high and I was excited for things to get done but my home is a fixer upper. I am greatly appreciative, but I wish the homeowner had a say in what repairs were prioritized."

"Some contractors did not seem to be on the same page. The gentleman who did the work seemed to have a different vision than the project manager and some things did not get done that the contractor said because the project manager did not agree."

"Best advice I would give is to be patient with the process and definitely use your voice even though ultimately the decision is not yours on what repairs are completed. I think this is a great opportunity. Thank you"

"I felt like my brothers and my father were working in my house. Let me tell you, everybody you sent to my house was so respectable, so down to earth, friendly and did nothing but their job. To the point that I trust them. To the point where I could walk out my house and leave them."

Pilot program summary

This pilot feasibility study combined an evidence-based CHW-led intervention with major structural housing repairs. We demonstrated the feasibility of health care organizations partnering with home repair agencies, with a signal for improved asthma control. Lessons learned include setting expectations for homeowners at the beginning of the repair process; when possible, allowing homeowners to prioritize which repairs are made; and the importance of having the CHW serve as the liaison between the homeowner and the contractor. Although we showed a decrease in symptoms and healthcare utilization, this was a pilot feasibility study in which follow-up data was collected during the COVID-19 pandemic. Early evidence shows that hospitalizations and ED visits for asthma decreased for all children with asthma during the pandemic, so future evaluations including a control group will be necessary to expand on our findings⁴⁸

This demonstration of feasibility and signal for improved outcomes prompted an expansion of this program (CAPP Plus) funded by the Children's Hospital of Philadelphia, which is now approaching 100 completed homes. Our hope is to serve as a model for other health care organizations to leverage expertise across different sectors to improve children's lives.

Discussion/Future Directions

While we highlight the results of several interventions with at least a signal of effectiveness, there is currently a paucity of rigorous research or evaluation of programs that complete targeted or major structural repairs to improve asthma morbidity. As stated earlier, this is likely due to the large financial investment necessary to complete such repairs at the scale necessary to show impacts on health outcomes. Other barriers beyond cost include the cross-sector collaboration and time-intensiveness of intervention planning and repairs, both of which require committed stakeholders, relationship-building, and a shared vision of the goals. Given these barriers, a common critique of this intensive and expensive approach is the concern about return on investment, especially if funding for such interventions comes solely from the health sector. This critique may be appropriate if the only goal is improving narrow asthma-specific metrics such as

376 symptom control or ED visits. But if the goal is to decrease or eliminate broader health
377 disparities by investing time and effort to address their fundamental causes, such as inhumane
378 housing conditions and wealth inequality from centuries of policies imbued with varying degrees
379 of structural racist practices such as redlining and exclusion, perhaps the return on investment
380 critique is shortsighted, both in time horizon and its underlying motivation. If we are to achieve
381 health equity, we first must correct the wrongs of disinvestment in these communities by
382 achieving adequate housing for all children, especially children who suffer from asthma.
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Table I - Characteristics of the children and households at time of enrollment in CAPP

Child characteristics	N	%
Age		
1-4	8	27%
5-9	14	46%
10-17	8	27%
Race		
Black	27	90%
Sex		
Male	15	50%
Female	15	50%
ED visit for asthma in the past 12 months (%)	-	90%
Hospitalization for asthma in the last 12 months (%)	-	86%
Household characteristics*	N	%

General condition of child's bedroom		
Poor	4	14%
Fair	17	61%
Good	7	25%
General assessment of home's condition		
Poor	8	26%
Fair	17	57%
Good	5	17%

**Household characteristics were assessed by CAPP community health workers at the time of enrollment in the program*

Table II Need for and completion of asthma-related structural repairs in home of children with asthma*

**Homes were assessed for structural deficiencies upon enrollment in the home repair program, and then again at final walkthrough to ascertain whether each repair had been completed*

	Structural Home Repairs	Homes Eligible for Repair a Initial Walkthrough	
		N	% of all homes
Pest-related repairs	Seal all accessible plumbing penetrations to exclude mice	22	81%
	Eliminate pests during demo: vacuum cockroaches, clean rodent sebum (rub marks), etc., cockroach frass (feces), and grease build-up, etc.	19	70%
	Fill rodent holes with copper mesh and finish with spackle or patching cement	17	63%
	Repair sub-floor & seal along walls to exclude rodents. Ensure there are no gaps behind cabinets, etc.	14	52%
	Seal cabinets to walls, floor, etc. with silicone caulk to deny pest access. Apply boric acid dust (cockroach prevention) into voids before sealing.	14	52%
	Seal Gaps and open joints in accessible HVAC ducts to reduce pest entry	13	48%
	Install wall or base cabinets in kitchen when they are badly damaged or missing, leading to insufficient storage for food.	9	33%
Mold- related repairs	Ensure that the roof and building shell are water-tight and properly shed water away from the home	23	85%
	Repair plumbing leaks in sinks, showers/tubs, toilets, supply lines and/or drain lines	19	70%
	Correct improperly vented exhaust fan to exhaust outside	11	41%
	Install dehumidifier if humidity in the home is above 60% and homeowner understands the maintenance requirements and electrical costs	9	33%
Dust- related repairs	Paint with low-VOC paint areas of home where interior paint covering is chipped or peeling	16	59%
	Remove carpeting in living areas such as living rooms, dining rooms, and hallways and install smooth, cleanable flooring	13	48%
	Vacuum and clean grates and termination points in duct systems	12	44%
	Remove carpeting in bedroom of person with asthma and install smooth, cleanable flooring	11	41%
	Replace air filters on heating/cooling system; install FilterLocks if the slot for the furnace filter allows air to bypass the filter.	10	37%

Table III. Parental report of in-home asthma triggers pre and post repair*

Environmental asthma trigger	Pre-Repair	Post-Repair	p-value**
Cockroaches	43%	13%	<0.01
Rodents	57%	26%	<0.01
Evidence of mold	53%	43%	0.41

* Prior to repair, the presence of environmental triggers was indicated if either the parent of the community health worker reported evidence of the trigger. Following repairs, all triggers were assessed by parental self-report.

**McNemar's Test was used to examine changes in the number of households with each outcome between the pre- and post-repair periods

Table IVa – Parental report of asthma symptoms pre- and post- home repairs*

Asthma Symptoms	Pre-Repairs		Post-Repairs	
	Mean	% reporting any	Mean	% reporting any
During the last four weeks, how many days did [child's name] have any daytime asthma symptoms (like wheezing, shortness of breath, tightness in the chest, or cough)?	1.9	70%	1.2	61%
During the last four weeks, how many nights did [child's name] wake up during the night because of asthma?	1.9	43%	0.5	22%
During the past 14 days, how many days did [child's name] use [his/her] quick-relief or rescue medicine (by pump or machine) to help stop asthma symptoms like wheezing, shortness of breath, tightness in the chest, or cough?	1.7	62%	0.8	39%
In the last four weeks, on how many days did [child's name] have to slow down or stop [his/her] play or activities because of asthma symptoms: shortness of breath, wheezing, tightness in chest, or cough?	1.7	60%	1.2	39%
There are many reasons children sometimes stay home from school. During the past twelve (12) months, how many days did [child's name] miss school due to asthma?	4.6	71%	0.8	30%
In the past 12 months, on how many days did you [or other caregivers] have to miss work to care for [child's name]'s asthma?	4.3	46%	0.4	17%

**Asthma symptoms were assessed by parental self-report at time of enrollment in CAPP, as well as at 12 months following completion of home repair*

Table IVb. Parental report of healthcare utilization pre- and post- repairs*

Healthcare utilization	Pre-Repairs		Post-Repairs	
In the past twelve (12) months, how many times has [child's name] made unscheduled visits to the doctor's office or clinic for urgent asthma care?	1.3	57%	0.5	22%
In the past twelve (12) months, how many times has [child's name] been treated in Emergency Department or ER for asthma?	1.3	90%	0.2	17%
In the past twelve (12) months, how many times has [child's name] had to stay overnight for one or more nights in a hospital for asthma?	1.0	86%	0.1	4%

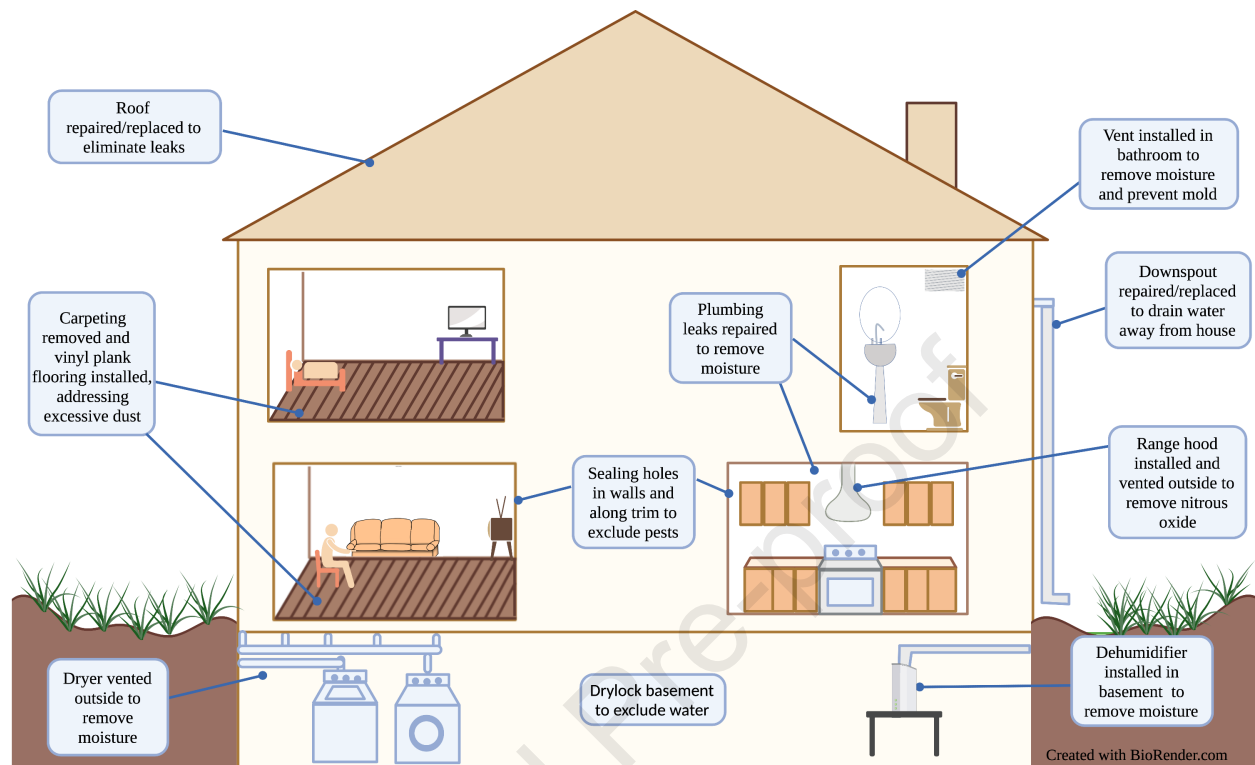
*Asthma morbidity was assessed by parental self-report

t at time of enrollment in CAPP, as well as at 12 months following completion of home repairs.

Figure Legends

Figure 1. Collaboration of partner organizations to support a home repair program for children with asthma

Figure 2. Image of structural repairs done in homes







Exterior Repairs

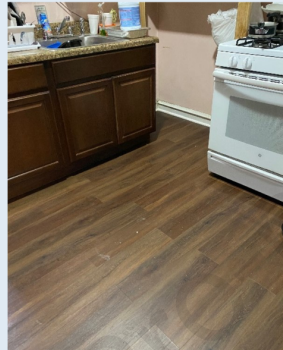


Leaky Plumbing Replaced - Before



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Kitchen Floor and Cabinets Replaced



Leaky Plumbing Replaced - After



Total Bathroom Renovation - Before and After



Moldy Bathroom Surround Replaced

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