



# HOME REMEDIATION AS A HIGH-IMPACT, COST-EFFICIENT INTERVENTION FOR PEDIATRIC ASTHMA IN DALLAS, TEXAS

APRIL 2025

Housing quality (the condition of the built environment of a home) affects a child's physical health, mental health, and academic performance.<sup>1</sup> The Joint Center for Housing Studies at Harvard reports that substandard housing is also linked to "financial hardship, energy insecurity, disaster vulnerability, social isolation, and neighborhood instability."<sup>2</sup> Poor housing quality in early childhood, for example, can increase the risk of an asthma diagnosis and can make existing asthma symptoms worse.<sup>3</sup>

- Dr. Tyra Bryant-Stephens, a leading pediatrician at the Children's Hospital of Philadelphia, concludes that **"healthy housing is perhaps the most critical" factor in asthma outcomes.**<sup>4</sup>
- Mice, dust mites, cockroaches, and mold are the top asthma allergens in Dallas.<sup>5</sup>

## ASTHMA IS AN ECONOMIC AND EDUCATIONAL BURDEN ON DALLAS FAMILIES.

- Uncontrolled asthma results in \$930M in health care expenses per year in Texas, including ~\$79M in Dallas County.<sup>6 7</sup>
  - In 2023, Dallas County children experienced **1,036 asthma inpatient hospital visits**. The combined cost of these visits was ~\$10.3M, for an average cost of **\$9,966 per visit**.
  - In 2023, Dallas County children experienced **6,999 asthma outpatient hospital visits**. The combined cost of these visits was ~\$8.7M, for an average cost of **\$1,237 per visit**.<sup>8</sup>
- Asthma is a leading cause of school absenteeism, causing 2.3 incremental days lost of school per child per year.<sup>9 10</sup>
  - **~67,000 children, or 10.35% of all children, in Dallas County suffer from asthma.** Asthma causes **~109K missed days of school** and **~\$31M in parents' lost wages** to care for their children.<sup>11 12 13</sup>
  - In the City of Dallas, CPAL estimates that 12,599 Hispanic children (7.5%), 11,390 Black children (15.3%), and 3,770 White children (7.3%) live with asthma. Black children in Dallas are diagnosed with asthma at more than double the rate of their White and Hispanic peers.<sup>14 15</sup>

# UNHEALTHY HOUSING EXACERBATES ASTHMA.

Asthma attacks often result from exposure to an allergen in the home. The Green & Healthy Homes Initiative estimates that **40% of all asthma episodes are caused by preventable home-based asthma allergens**, like dust, pests, and mold.<sup>16</sup> These preventable asthma attacks lead to expensive asthma hospitalizations and missed days of school and work. Mitigating in-home asthma triggers can improve asthma outcomes, such as reduced emergency room visits, and result in greater school and work attendance.

- To address home-based asthma triggers, Dallas County Health and Human Services and Dallas Children's Health offer asthma home visit programs that educate families on asthma management and offer home supplies, like allergen-free pillow cases and mattress covers. However, these programs do not currently provide for home repair that would mitigate asthma allergens.
- Remediation of issues like mold is cost prohibitive and logistically challenging for many families. Therefore, in-home allergens often go unaddressed.

## PROGRAM SPOTLIGHT:

**Children's Hospital of Philadelphia's Community Asthma Prevention Program+ (CAPP+) shows that targeted home remediation can improve asthma outcomes.**

- Studies across various cities have shown **remediating in-home asthma allergens can effectively improve asthma outcomes and reduce health care utilization.**<sup>17 18 19</sup>
- CAPP+ provides home repairs for families with children with severe asthma, enrolled in an asthma home visit program, and who live in homes with structural issues linked to asthma exacerbation.
- The repairs focus on dust, mold, and pests by eliminating water intrusion, providing adequate ventilation, and removing dust sources.
- The following table shows results from the 12-month pre-intervention and 12-month post-intervention periods for the 30 households enrolled in the first cohort of CAPP+:

	Percentage of households that report in-home allergen			Average number of asthma-related health care utilization events per child with asthma			Average number of asthma-related economic mobility events per child with asthma	
	Cock-roaches	Rodents	Evidence of Mold	Urgent Care Visits	ED or Emergency Room Visits	Overnight Stays at Hospital	School Days Missed	Work Days Missed
Before Repair → After Repair	43% → 13%	57% → 26%	53% → 43%	1.3 → 0.5	1.3 → 0.2	1.0 → 0.1	4.6 → 0.8	4.3 → 0.4
Percent Change	-70%	-54%	-19%	-62%	-85%	-90%	-83%	-91%

# IN DALLAS, THE ESTIMATED COST TO REMEDIATE IN-HOME ASTHMA TRIGGERS IS OFTEN LESS THAN THE COST OF AN ASTHMA HOSPITALIZATION.

- Home remediation is a cost-efficient method to reduce health care utilization and spending.
- **Children and families can see dramatic improvements in asthma and economic mobility indicators (e.g., school attendance) in the first year** after a home remediation intervention.

Average cost of asthma-related inpatient hospitalization in Dallas County in 2023	Estimated cost of mild to moderate asthma-related home remediation intervention in Dallas
<b>\$9,966</b>	<b>\$3,000 to \$15,000</b> <sup>20 21</sup>

## About CPAL

1 in 4 Dallas children are growing up in poverty. At CPAL, we are working to reduce the child poverty rate by 50% in a single generation. We operate as an unofficial R&D department for Dallas, rethinking how data can be integrated into public systems, community programs, and neighborhood life to break cycles of intergenerational poverty. Guided by evidence, we focus on impactful strategies aligned with five 'big bets' for driving economic mobility in our community: Benefits Delivery, Maternal Health, Housing, Criminal Justice, and Safety.

Three key principles underpin CPAL's approach:

1. *Design for scale*: Child poverty is a problem of massive scale and requires the magnitude of government resources to fund solutions of equal scale. CPAL brings together the leaders of nine Dallas public agencies with a collective annual operating budget of over \$10 billion to align local resources and take collective action on promising interventions.
2. *Center on evidence*: CPAL develops and applies evidence-based outcomes frameworks on child poverty alleviation programs. Data is used to determine where to develop interventions and to evaluate if those interventions are working. CPAL equips our partners and community leaders to use data so they can make better decisions.
3. *Power with community expertise*: By empowering community based organizations, residents, families, or frontline teams with tools, resources, and access to leaders, CPAL builds a broad coalition for sustainable efforts to combat child poverty.

## Sources and Notes:

1. Gaitán V, How Housing Affects Children's Outcomes, Urban Institute, 2019
2. Martin C, Mallach A, Swanstrom T, Harrison A, Wedeen S, Catalyzing a Movement to Produce Greater Public, Private, and Civil Resources to Improve Housing Conditions for Home Repair, Joint Center for Housing Studies at Harvard University, 2024
3. Bryant-Stephens TC, Strane D, Robinson EK, Bhambhani S, Kenyon CC, Housing and asthma disparities. J Allergy Clin Immunol. 2021
4. Krieger J. Home is Where the Triggers Are: Increasing Asthma Control by Improving the Home Environment. Pediatr Allergy Immunol Pulmonol. 2010
5. CPAL Correspondence with Dr. Folashade Afolabi, January 12, 2024
6. Rice University, Baker Institute for Public Policy, Examples of Priority Health Conditions Improved by Non-Medical Interventions
7. CPAL analysis of United States Census Bureau Quickfacts
8. Based on asthma as principal diagnosis or as diagnosis position 2-5 with upper respiratory issue as principal diagnosis for patients under the age of 18, Texas Hospital Inpatient and Outpatient Discharge Public Use Outpatient and Ambulatory Surgical Center Data Files, Quarters 1-4, 2023. Texas Department of State Health Services, Center for Health Statistics-THCIC, Austin, Texas. 2025. CPAL calculated total and average costs by applying the appropriate cost-to-charge ratio to each Dallas County hospital's total pediatric asthma charges. Charges refer to the amount billed by a health care provider before any adjustments and often do not reflect actual costs incurred by a hospital. Cost-to-charge ratios are used to estimate actual hospital service delivery costs. A CCR was not identified for ~21% of outpatient charges; a weighted average CCR from the other 79% of charges was used to estimate costs for the charges without a CCR.
9. Hsu J, Qin X, Beavers SF, Mirabelli MC. Asthma-Related School Absenteeism, Morbidity, and Modifiable Factors. Am J Prev Med. 2016
10. Nurmagambetov T, Kuwahara R, Garbe P, The Economic Burden of Asthma in the United States, 2008-2013, Ann Am Thorac Soc Vol 15, 2018
11. CPAL calculations, based on formula from page 5 of The Economic Burden of Asthma in the United States, 2008-2013; Pediatric Asthma Populations \* % School Age \* Incremental days missed from school \* Median Wage for Dallas County; (67,078) \* (12/17) \* (2.3) \* (74,350/52/5)
12. Median Daily Wage from 2023 ACS 1-Year Estimate
13. Dallas Children's Health, Beyond ABC Report, 2023
14. Child and Adolescent Health Measurement Initiative. 2022 National Survey of Children's Health (NSCH) data query. Data Resource Center for Child and Adolescent Health supported by the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB). Retrieved January 2025 from Children's Health Data
15. American Community Survey, 2023, 5-year estimates
16. Green & Healthy Homes Initiative
17. Kercsmar C, Dearborn D, Schluchter M, Xue L, Kirchner HL, Sobolewski J, Greenberg S, Vesper S, Allan T, Reduction in Asthma Morbidity in Children as a Result of Home Remediation Aimed at Moisture Sources | Environmental Health Perspectives, Environmental Health Perspectives, 2006
18. Bryant-Stephens TC, Strane D, Robinson EK, Bhambhani S, Kenyon CC, Housing and Asthma Disparities. J Allergy Clin Immunol. 2021
19. Crocker D, Kinyota S, Dumitru G, Ligon C, Herman E, Ferdinands J, Hopkins D, Lawrence B, Sipe T, Effectiveness of Home-Based, Multi-Trigger, Multicomponent Interventions with an Environmental Focus for Reducing Asthma Morbidity: A Community Guide Systematic Review - ScienceDirect, American Journal of Preventive Medicine, 2011
20. \$3,000 for comprehensive home remediation = \$1,000 for one-year of Integrated Pest Management + \$500 for air duct cleaning + \$1,500 for mold abatement; based on estimates from Dallas-based home-remediation service providers: Anthem Pest Control, Best Airduct, Fox Duct Dallas.
21. CAPP+ spends an average of \$13,000 to \$15,000 per home. Dallas-based home repair agencies report similar budgets for minor home repairs.

## Acknowledgements:

CPAL would like to thank the following for their assistance on this project: Dr. Folashade Afolabi from UT Southwestern, Pam Rogers and Dr. Stormee Williams from Dallas Children's Health, Waldu Ameneshoa, Kelly Wilmore, and Semira Abdourezak from Dallas County Health and Human Services, Dr. Tyra Bryant-Stephens and the CAPP+ team from Children's Hospital of Philadelphia, Dr. Chau Truong and Caroline Schaefer from UT Health, Theresa Mendoza from the DFW Hospital Council, Dr. Charles Mathias from Rice University, and Ashlyn Magee from Hearts and Hammers.

For more information, please contact:

Joey Blatt

Director of Housing Impact

Child Poverty Action Lab

joey@cpal.org