



# Return on Investment on Healthy Home Interventions for Children with Asthma

Halie Smith & Shannon Melton, MPH  
Omaha Healthy Kids Alliance  
#ProjectAIR

## Background

Asthma is a chronic respiratory disease that is characterized by the inflammation and narrowing of the airways (CDC, 2014). This disease affects over 25 million Americans including 6.8 million children making it one of the most prevalent chronic pediatric diseases (CDC, 2016; Margellos-Anast, Gutierrez & Whitman, 2012).

According to studies, people in the U.S. spend over 90% of their time indoors, and upwards of 50% inside their homes (Wu & Takaro, 2007). According to research performed by Crocker et al. (2011), there is no question that the home environment and health of the residents, especially in regards to asthma, are directly related. Housing conditions have a significant role in the exacerbation or development of asthma. The exposure to indoor allergens are often times related to the quality of housing. These hazards include pests, dust mites, pets, mold, and environmental tobacco smoke (ETS) (Crocker et al., 2011).

In this presentation, Omaha Healthy Kids Alliance (OHKA) will discuss Project AIR (Asthma In-home Response), a preventative approach to reducing asthma by improving substandard housing and providing in-home education.

This presentation includes details about the methods for the development of this program, data and trends identified in Project AIR homes and the results for the completed interventions.

1 in 11 children in the U.S. have asthma



CDC (2016). Asthma

## Project Description

Project AIR (Asthma In-Home Response) is a service and research project to help reduce asthma triggers in the home. Project AIR was designed to reduce emergency department visits and hospitalizations for asthma-related symptoms and document a return on investment for Healthy Housing interventions. Project AIR models the multi-trigger, multicomponent, home-based asthma intervention as a proven model for pediatric asthma patients.

### Project AIR goals:

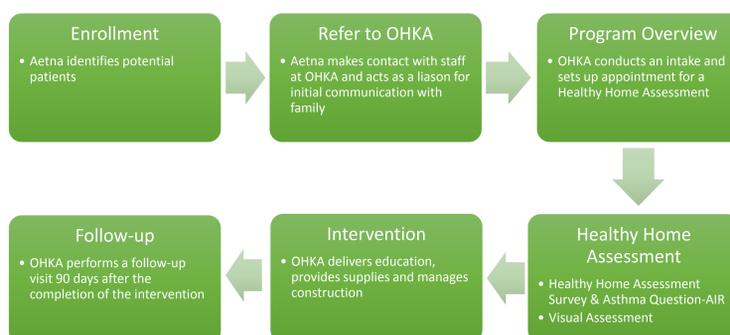
- Decrease emergency department visits and hospitalizations due to asthma
- Increase in quality of life for parents and caregivers
- Encourage positive changes in behavior in regards to asthma triggers in the home
- Document a return on investment of Healthy Housing interventions
  - Cost savings for insurance company
  - Cost savings for family

*An emergency department (ED) visit for asthma in Omaha costs approximately \$1800. OHKA spends about \$1500 on an in-home intervention to prevent the child from returning to the ED.*

## Methods

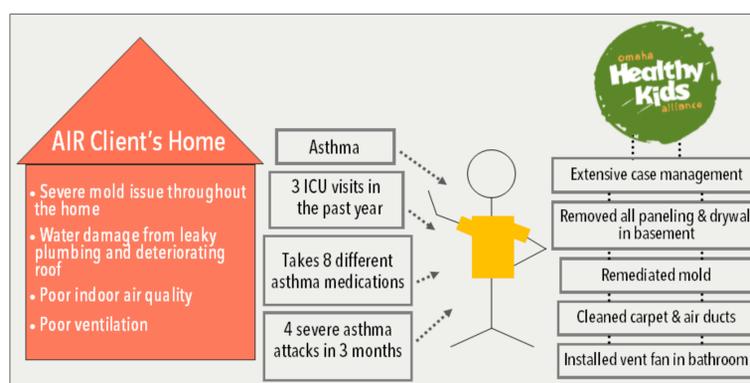
This randomized control study includes a control and intervention group to determine the return on investment of Project AIR's Healthy Home interventions for children diagnosed with asthma. The inclusion criteria for the study is as follows:

- Resident of Omaha, Nebraska, and
- Between 2 and 18 years old, and
- Minimum of six months continuous enrollment in health plan, and
- Primary or secondary diagnosis of asthma reported using ICD-9 CM diagnosis codes 493.0 - 493.9, and
- Have at least one claim for inpatient admission with a primary or secondary diagnosis of asthma using ICD-9 CM diagnosis codes 493.0 - 493.9 during the prior eighteen months, or
- Have at least three emergency department (ED) visits with a primary or secondary diagnosis of asthma using ICD-9 CM diagnosis codes 493.0 - 493.9 during the prior eighteen months.



## Case Study

*"Had it not been for your help, the mold would still be in the basement and we would still be going back and forth to the hospital." -Mandy, Project AIR client*



Brighton was 2 years old when he was admitted to the intensive care unit (ICU) with triggers including dust, dust mites, scented products and tobacco smoke. Within that same year, he was admitted to the ICU two more times due to asthma attacks. OHKA conducted a Healthy Home Assessment and found active water leaks, mold growth, and poor indoor air quality – all of which contributed to Brighton's asthma.

OHKA educated the family about the hazards in their home and developed a plan to improve indoor air quality. The family fixed the water leaks and OHKA removed the mold, installed a vent fan, and cleaned carpets and ducts.

By investing their own time and money, the family has demonstrated a significant commitment to sustain the work that OHKA has started. As a result, the family feels much more confident in their ability to manage the living conditions to improve Brighton's health.

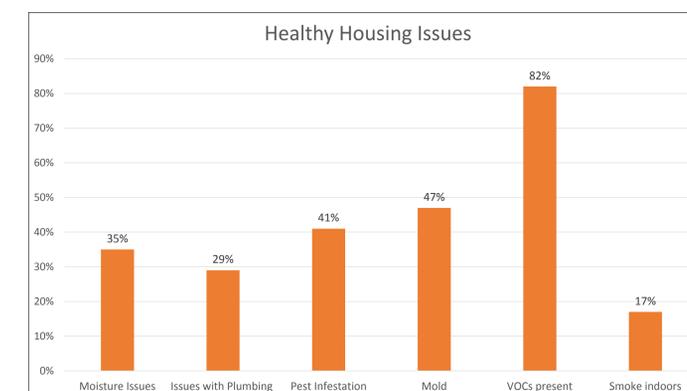
## References

- CDC (2014). *Asthma prevalence in the United States*
- CDC (2014). *Learn How to Control Asthma*
- CDC (2016). *Asthma*
- Crocker, D.D. et al. (2011). *American Journal of Preventative Medicine* 41(2S1), S5-S32
- Margellos-Anast, H. et al. (2012). *Journal of Asthma*, 49(4), 380-389
- Wu, F. (2007). *Environmental Health Perspectives* 115(6), 971-975

## Current Progress



Since January 2015, OHKA has received 44 referrals from Aetna Better Health of Nebraska. Each family is contacted at least three times to schedule or confirm appointments before they are considered "lost to follow-up." Eight (n=8) of the completed interventions have had a 3 month follow-up evaluation. The remaining evaluations will be completed throughout 2016.



Of the homes that OHKA has visited through Project AIR, 82% of the families were using some product that emitted volatile organic compounds (VOCs) such as: candles, air fresheners, or harsh cleaning chemicals. More than half of the families were battling an active water issue in the home that contributed to mold growth. Pest infestations were present for 41% of the families. Seventeen percent of the families smoked indoors.

	Pre-Intervention (n=8)	Post-Intervention (n=8)
ED visits	10	2*
Hospitalizations	4	0
Number of symptomatic days (in 2 weeks)	41	20
Average number of missed school days	3.87	2.25
Average number of missed work days	2.25	1.375
Asthma Action Plan in place	56%	88%

\*not related to environmental triggers  
This information is based on the 8 families that have completed their follow-up for Project AIR.

## Future Work

Project AIR is in the early stages of evaluation to determine the return on investment and true impact of the Healthy Home interventions for children with asthma. Based on the data collected, Project AIR has demonstrated that Healthy Home interventions help improve health outcomes, improve the families' quality of life and increase overall productivity.

OHKA will continue to work with Aetna Better Health of Nebraska to complete the study and plans to expand this program in a new partnership with Omaha's two Federally Qualified Health Centers (FQHC) and Children's Hospital and Medical Center.

**Acknowledgments:** Aetna Better Health of Nebraska and Hongmei Wang at the College of Public Health at the University of Nebraska Medical Center. Funding for this project is provided by the Kresge Foundation, United Way of the Midlands, the City of Omaha, the Mammel Foundation, HDR Foundation, and the Omaha Community Foundation.

**Contact Information**  
Shannon Melton, MPH  
Shannon@omahahealthykids.org  
402-934-9700



**Contact Information**  
Halie Smith  
Halie@omahahealthykids.org  
402-934-9700

