

# The HAPI Project

## A Community-Academic Partnership

The Home Air in Agriculture Pediatric Intervention (HAPI) study – launched in 2014 - is coordinated by a community and academic partnership built upon trust, communication, and shared goals.



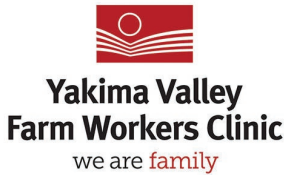
### The Partnership

The **University of Washington, Yakima Valley Farm Worker’s Clinic, and Northwest Communities Education Center/ Radio KDNA** collaborated in response to community concerns and data on pediatric asthma and air quality.



 **Yakima Valley Farm Workers Clinic (YVFWC)**

- ◆ A set of federally qualified community health centers
- ◆ YVFWC asthma program team led family recruitment, scheduling, health assessments and home visits



 **Northwest Communities Education Center (NCEC)/ Radio KDNA**

- ◆ A community-owned 24-hour Spanish language radio station
- ◆ Completed environmental sampling in families’ homes during study visits



 **University of Washington**

- ◆ Oversaw data collection and analysis
- ◆ Supervised field staff training



## Common Environmental Triggers

- Asthma is a chronic disease that inflames and narrows airways in the lungs. There is no cure, but it can be managed.
- Outdoor and indoor air pollution increases asthma symptoms and severity.



### Indoor

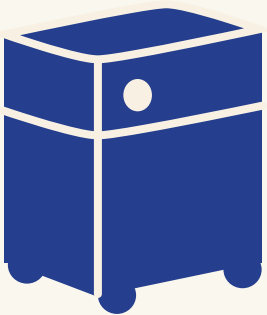
- ◆ cooking fumes
- ◆ harsh cleaning agents
- ◆ cigarette smoke
- ◆ wood-burning stoves
- ◆ pets
- ◆ dust mites
- ◆ pests (rodents, cockroaches)
- ◆ candles, perfume, and air freshener
- ◆ pesticides and fertilizer
- ◆ dust



### Outdoor

- ◆ dust from roads and agriculture
- ◆ smoke from agricultural burning, fires, and wood stoves
- ◆ emissions from traffic, trucks, and cars
- ◆ pollen

## Control of indoor air quality



- ◆ Install a HEPA\* filter - a portable home air cleaner (\*high-efficiency particulate air).
- ◆ Use a green cleaning kit, such as baking soda and vinegar, in place of harsh cleaners. Avoid use of pesticides.
- ◆ Reduce sources such as smoking indoors or using candles, wood-burning stoves, and fireplaces.
- ◆ Check the Environmental Protection Agency AirNow for the Air Quality Index.
- ◆ Ventilate when cooking produces fumes.
- ◆ If allergic to pets, keep them outside and out of sleeping areas.

# HAPI Project

## Study Design

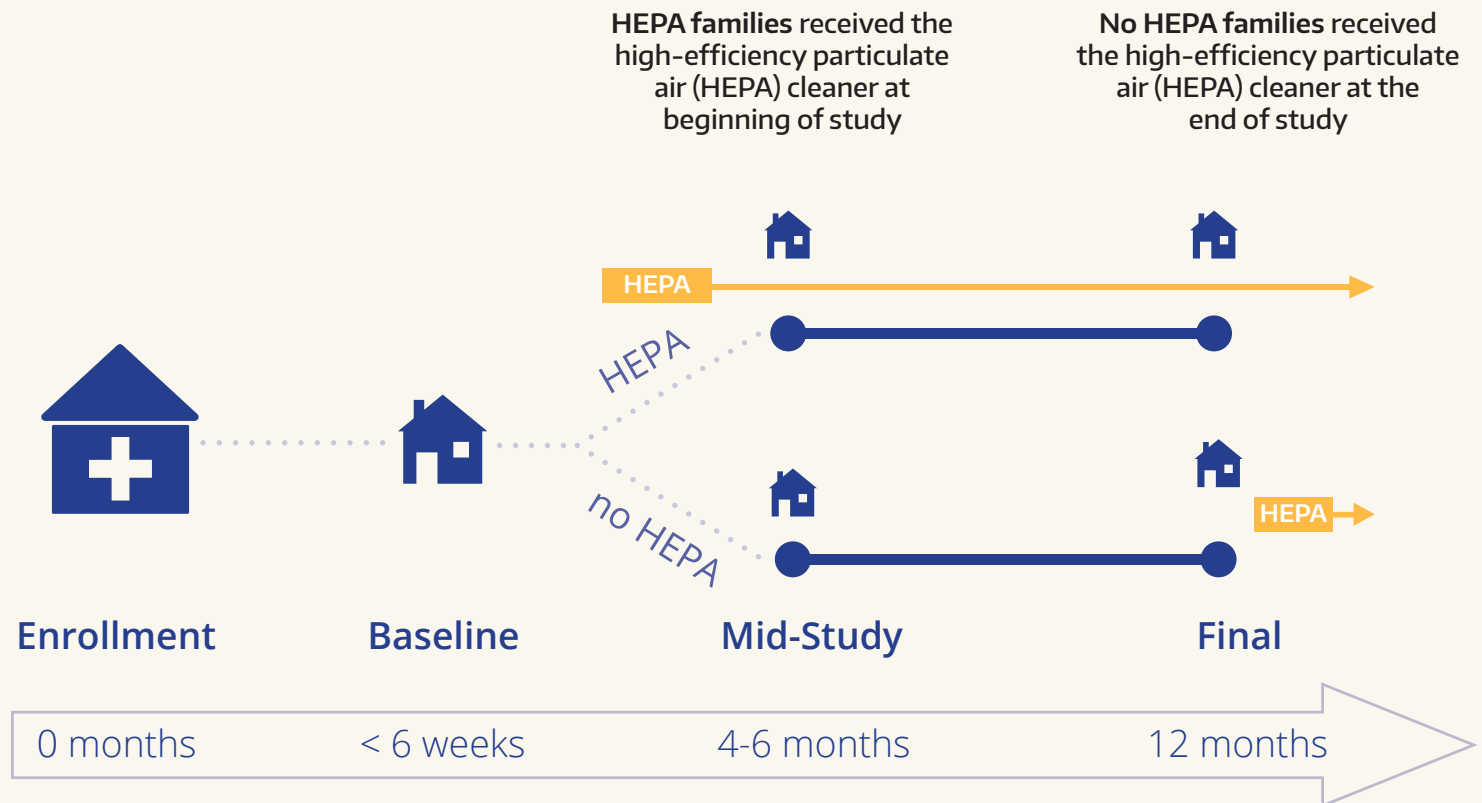
Patients in the Yakima Valley Farm Worker's Clinic (YVFWC) were invited to participate based on their asthma symptoms.

- ◆ Families were placed in the **HEPA** or **no HEPA** group
- ◆ 76 families started baseline assessment
- ◆ 71 families completed the study

### HEPA and no HEPA families

All participants received the YVFWC asthma education program, including an asthma prevention kit, and information about asthma triggers and asthma medications.

All families were assessed twice after the baseline visit.



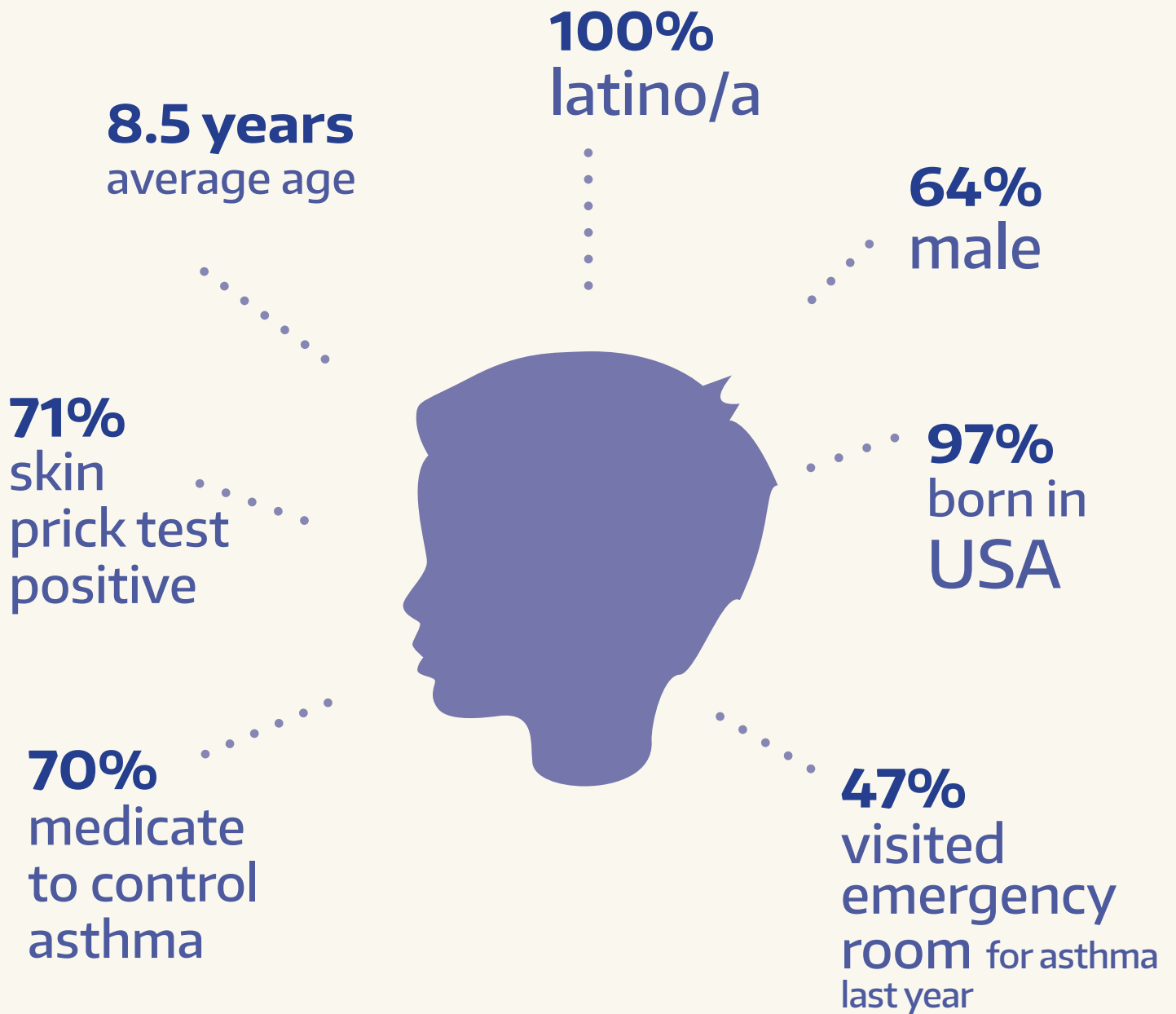
### What's in the asthma prevention kit?

- ◆ asthma medicine boxes
- ◆ mattress and pillow dust mite cover
- ◆ a green cleaning kit with non-irritating cleaning items such as vinegar and baking soda



# HAPI Project

## Participant Characteristics



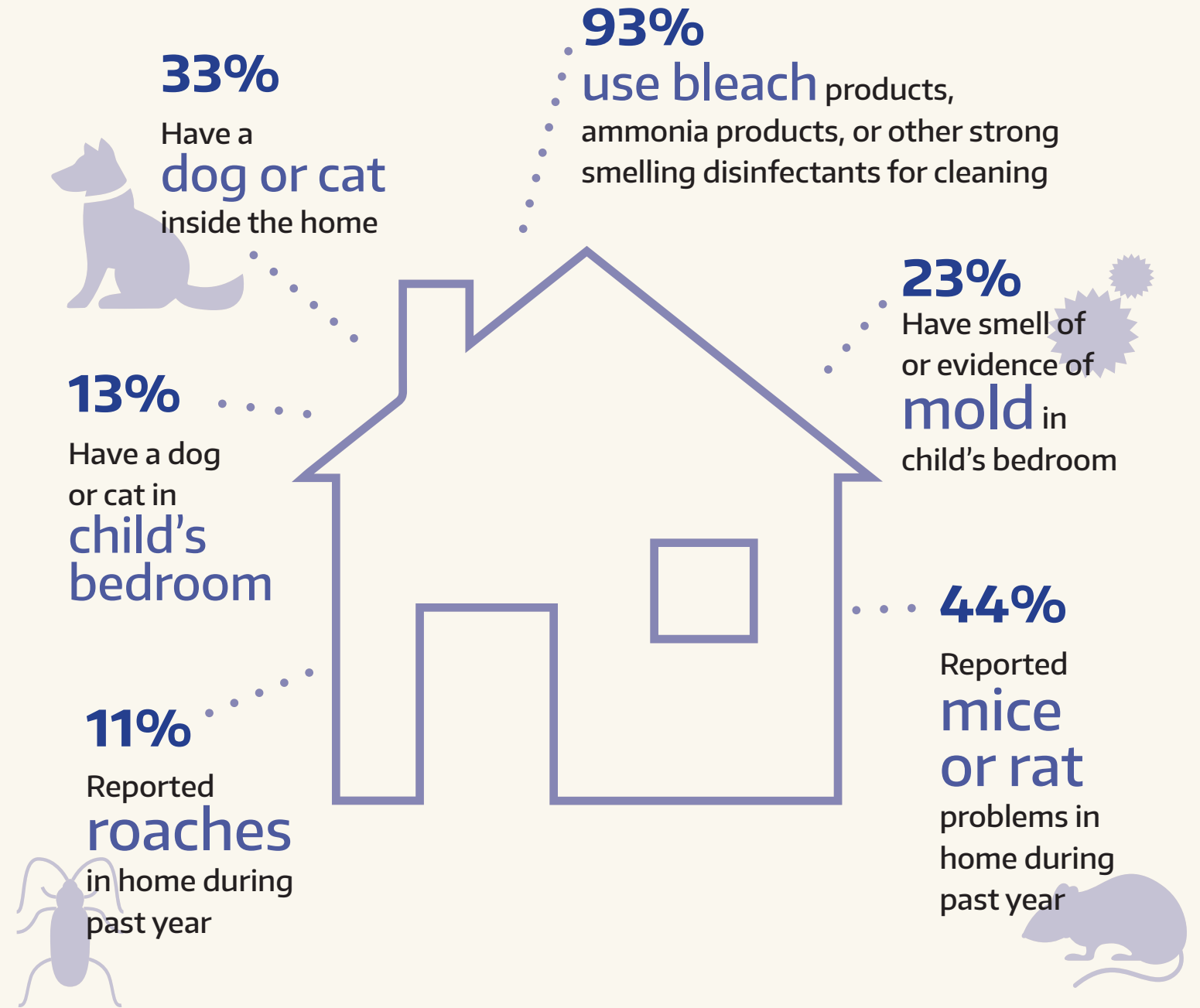
## Participant Family Characteristics

**58%** annual income < \$30,000

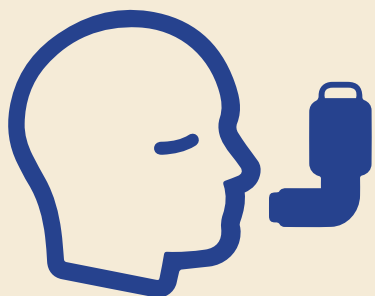
**96%** use public insurance

# Home Environmental Checklist

## Common asthma triggers identified in homes



## Caregiver Stress



We measured how the caregivers described their level of stress related to their child's asthma.

27%

"I have doubts that I am doing the right things in the treatment of my child's asthma."

"My child's asthma has caused stress in my family."

48%

68%

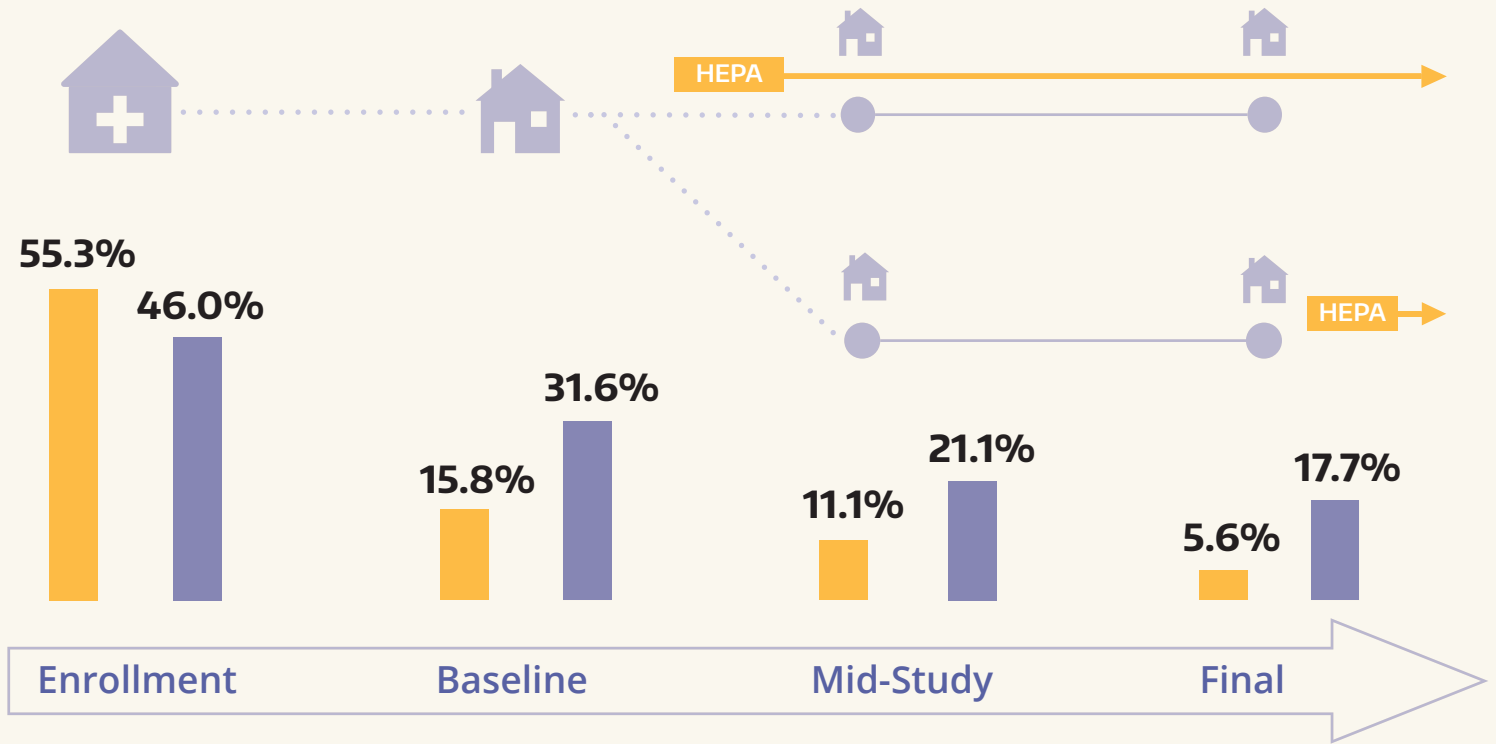
"I am concerned about side-effects my child could get from taking asthma medicine for a long time."

# HAPI Project Results

Families were placed in the **HEPA** or **no HEPA** group. 76 families started baseline assessment. 71 families completed the study.

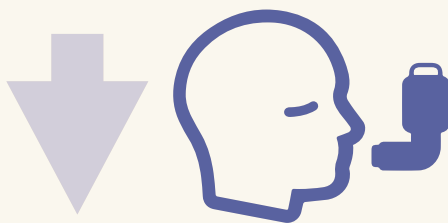
## Percent of children with poorly controlled asthma\*

HEPA  
no HEPA



\*Asthma control test score. Adj for baseline, season, sex, age  $p = 0.04$

Over their year as HAPI study participants, all kids demonstrated improvements in their asthma.



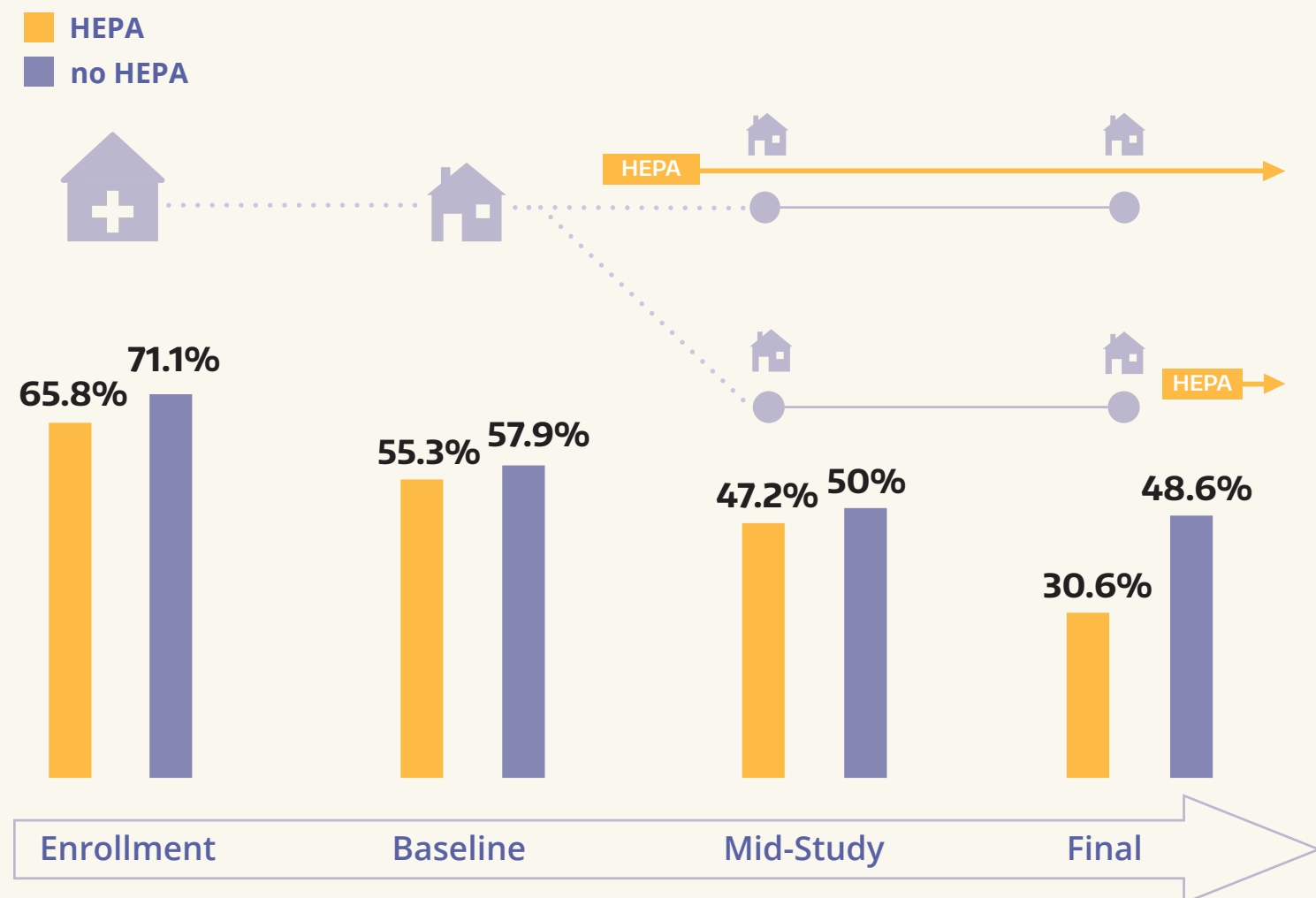
**fewer kids had poorly controlled asthma**  
(based on Asthma Control Test)

# HAPI Project Results

## Does HEPA cleaner affect asthma health?

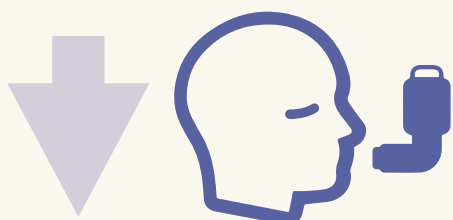
Families were placed in the **HEPA** or **no HEPA** group. 76 families started baseline assessment. 71 families completed the study.

### Percentage who reported symptoms in the last 14 days



Adj for baseline, season, sex, age  $p = 0.09$

Over their year as HAPI study participants, all kids demonstrated improvements in their asthma.

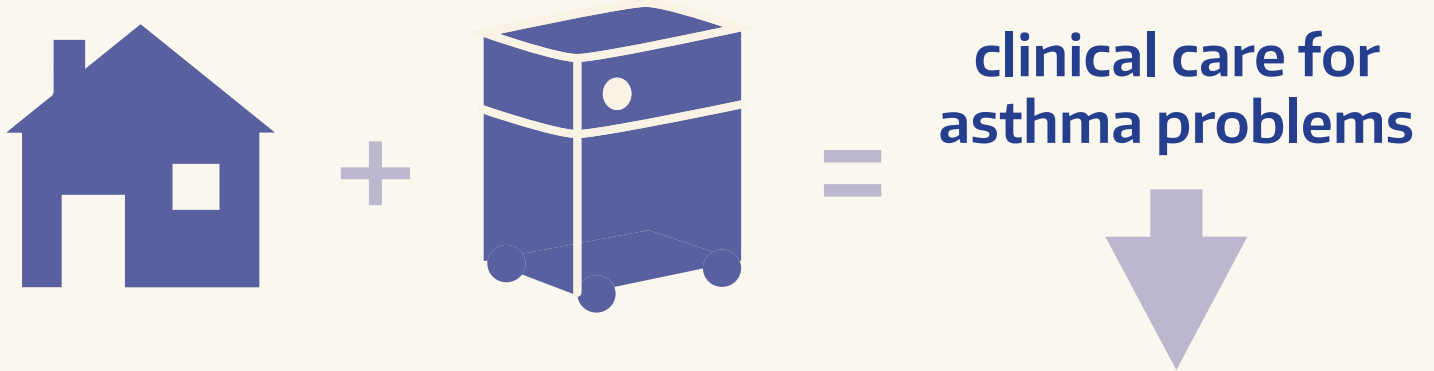


**kids reported fewer asthma symptoms in the past 2 weeks**



# HEPAs Effect on Asthma Health

We compared children in homes with HEPAs to children in no HEPA homes. We used statistical tests to determine if having HEPA Air cleaners improved asthma outcomes.



Kids in homes with HEPAs were 72% less likely to have an unplanned visit to clinic or hospital compared to children residing in no HEPA homes. This effect was stronger among kids who had more symptoms at beginning of the study (87% less likely).

Adj for baseline, season, sex, age  $p = 0.07$

% of people who had unscheduled clinic visit, ED visit or hospitalization during the study year:

**11.1%** HEPA group

**51.4%** no HEPA group

# PM 2.5 Results

## Does HEPA cleaner affect indoor air quality?



We measured air pollution in participants' homes: fine dust called **particulate matter 2.5**, a mix of tiny solid and liquid particles in the air. It is known to cause problems for children with asthma.

We reviewed **PM2.5** data for both **HEPA families** as a group and the **no-HEPA families** as a group. These were the average changes in the child's sleeping area:



HEPA families

**65%**

reduction in PM2.5 levels



no HEPA families

**19%**

reduction in PM2.5 levels

## How to reduce exposure to Particulate Matter?



- Use a kitchen fan when cooking.
- Reduce burning as much as possible including wood burning.
- Check EPA AirNow for the Air Quality Index and type in your ZIP code to get information on outdoor air quality. On days with unhealthy air quality, reduce outdoor activity when possible. <https://www.airnow.gov/>
- Use the portable home air cleaners provided by the study. Maintain regularly by vacuuming the exterior.

# Dissemination Plan

Sharing results with a wider audience  
2019 - 2020

## Summer



### Who

- Yakima Valley community



### How

- Health Fairs throughout Yakima Valley
- 1-hour radio program and Q&A on Radio KDNA

## Fall



### Who

- HAPI participants
- Yakima Valley Farm Worker's Clinic staff and providers



### How

- Housing Fair at Radio KDNA
- Radionovela on Radio KDNA
- Meetings and presentations

## Winter



### Who

- Yakima County Health District, Yakima Regional Clean Air Agency
- Community Health Workers
- Heritage University



### How

- 1-hour radio program and Q&A on Radio KDNA
- Radionovela on Radio KDNA
- Meetings and presentations



## What

- Study activities
- Health outcomes
- Indoor air quality
- Home environmental checklist
- What can be done