Green & Healthy Homes Initiative™

Regional Summit on Pediatric Home Asthma Interventions

Green & Healthy Homes Initiative (GHHI) Baltimore

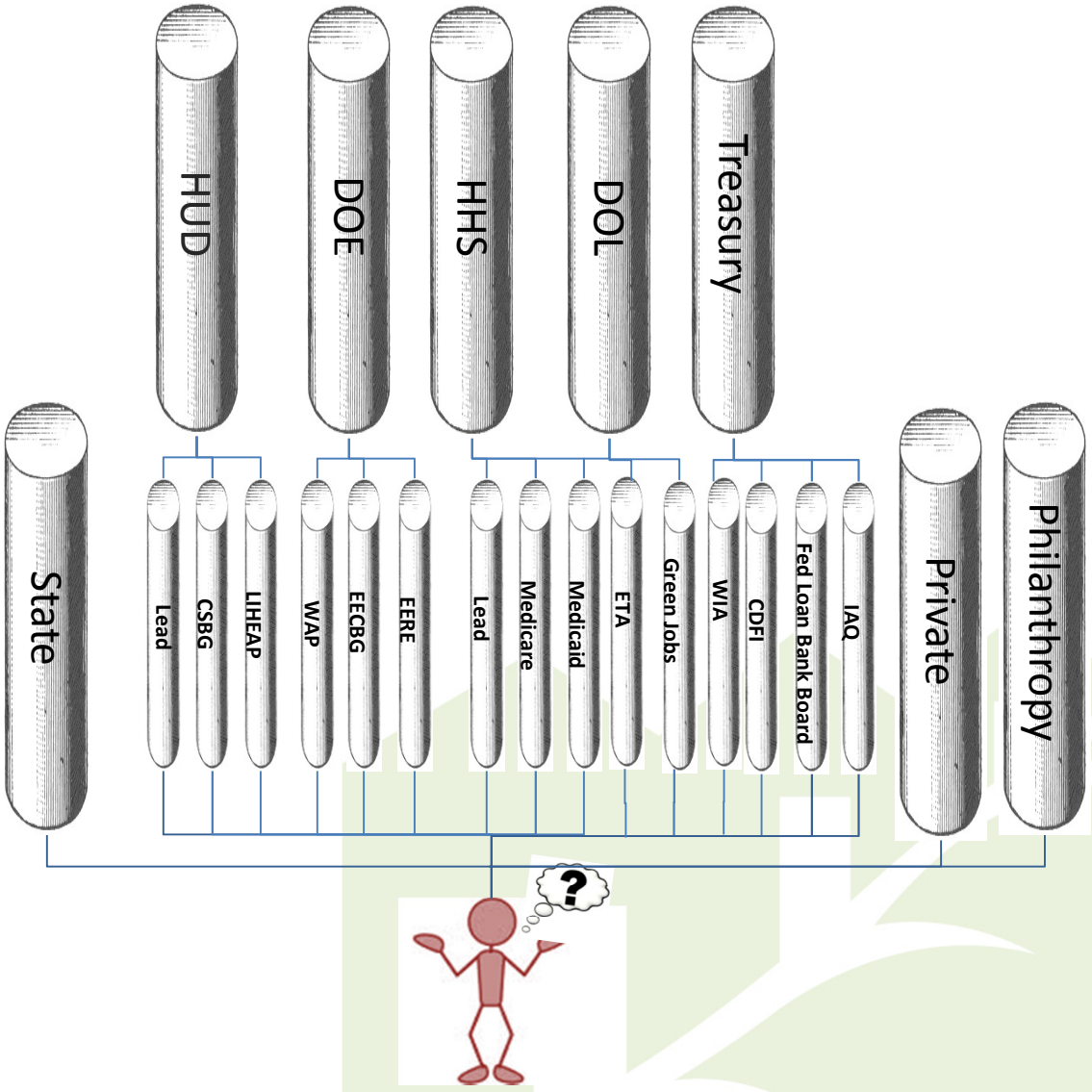
Ruth Ann Norton

January 17, 2014

Baltimore, Maryland

How Most Residents Experience Housing Intervention Programs

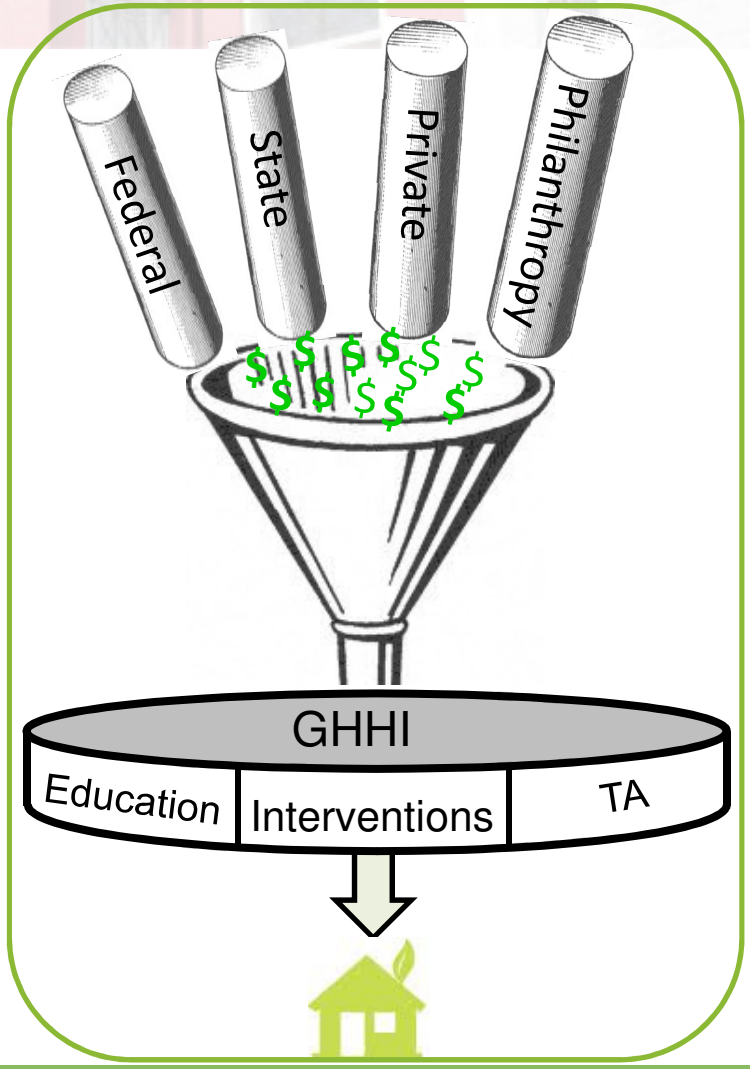
Green & Healthy Homes Initiative



The Results

How Residents Experience the GHHI Model

Efficient delivery of investment and services for improved health, economic and social outcomes through healthier, energy efficient and safe homes



GHHI Baltimore Healthy Homes Program Model

When Healthy Homes Program Started - 2000

Who Program Targets - Asthma diagnosed children ages 2-14 in Baltimore City; priority on children with prior asthma related ED visit or hospitalization; Family income ≤80% AMI

Type of Housing - Low income owner occupied and rental homes in Baltimore City; Typically row homes constructed prior to 1950

Units Completed - 1,660 families enrolled and 1,480 Healthy Homes interventions completed by the program to date using tiered intervention strategy and in-house GHHI Baltimore Hazard Reduction Team

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GHHI Baltimore - Single Portal Intake and Shared Data Platform "No Wrong Door"

Primary Referral Sources - MCOs, Health Care Providers, Health Department, GHHI Baltimore Partners

Single Portal Intake and Shared Data Platform

- Eliminates fractured service delivery – delivers maximum response
- Creates efficiencies and improves access to "care"
- One time enrollment and eligibility determination
- Eliminates missed opportunities
- Allows priority on making homes and families whole

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Environmental Assessment & Resident Education Together

- **Environmental Assessor-Energy Auditor (HHS/BPI)**
  - Conduct pre-intervention environmental assessments
  - Conduct energy audits
  - Develop comprehensive scopes of work for properties
  - Conduct post intervention assessments and audits

- **Community Environmental Health Educator (CHES/AE-C)**
  - Conduct asthma/HH resident education during assessment
  - Coordinate pre and post client health surveys
  - Review asthma action plan with the client
  - Coordinate referrals and follow-up client services
  - Distribute HEPA-Vacuum and indoor allergen reduction kit
  - Post remediation education and follow-up with HCP

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Healthy Homes Intervention Strategy

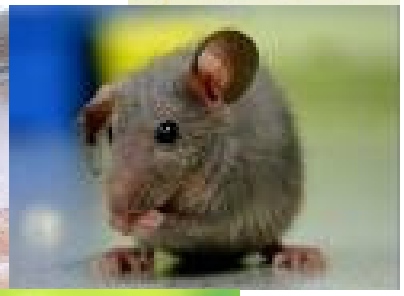
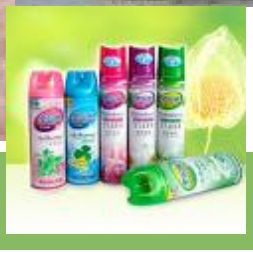
- Reduce Asthma Triggers in the Home
- Address Health & Safety Hazards

Asthma Trigger Reduction

- Mold and Moisture
- Extreme Heat and Cold
- Cockroaches
- Mice and Rats
- Dust Mites
- Chemical Odors
- Tobacco Smoke
- Poor IAQ





GHHI Healthy Homes Interventions

- Installation of mattress and pillow covers
- Integrated Pest Management - Gel Baits, Boric Acid, Glue Traps, Reducing Entry Points, Cleaning, & Behavioral Change (Clutter)
- Mold remediation
- Venting kitchen, bathroom, and dryer; furnace filter replacement
- Removal or steam cleaning of carpets
- Austin Air filtering system installed in child's bedroom (HHD)
- Air conditioners and dehumidifiers
- Provision of a HEPA-vacuum and indoor allergen reduction cleaning kit to the client
- Injury prevention measures including: installation of smoke alarm (with 10 year lithium battery), carbon monoxide alarm, cabinet locks, electrical outlet covers, etc.
- Integrated, leverage funded GHHI weatherization and energy efficiency intervention using cross trained workers

Outcomes - Asthma Impact

200 Units Completed – 136 Initial 6 Month Post Intervention Surveys Completed to Date (Evaluation ongoing through 12 months post intervention)

- 88% increase in participants reporting that their child didn't have to work harder to breathe
- 60% reduction in total number of asthma related client hospitalizations in participant pool post intervention
- 50% increase in participants never having to visit the doctor's office due to asthma episodes
- 55% increase in participants reporting their child's asthma as well controlled
- 62% increase in participants reporting asthma-related perfect attendance for their child *(0 school absences due to asthma episodes)*
- 88% increase in participants reporting never having to miss a day of work due to their child's asthma episodes

Outcomes - Smith Family - 5004 Alhambra Ave (Homeowner)

- Family of four with a son who has severe asthma
- History of repeated asthma episodes resulting in hospitalizations on average of three times per year since birth (Average stay 1 week each time)

Triggers: Asthma triggers (rodents, dust mites, excessive moisture, VOCs, poor weatherization, poor IAQ)

GHHI Intervention Cost: $8,826
Non-GHHI Process: $10,615 (Net projected savings of $1,879)
Program Funding: HUD OHHLHC, MEA, CDBG, CSBG, Foundations

Results: Son was not hospitalized due to asthma triggers in the home in the 12 months following the intervention, resulting in savings of avoided medical costs of $48,300 in first year alone

- Allergens and lead hazards remediated
- Home weatherized and annual energy cost savings of $721
- Son is playing sports and performing well in school

Cost/Economic Outcomes

Asthma Costs in Baltimore City

- Average cost of asthma related ED Visit in Baltimore: $820
- Average cost of asthma hospitalization in Baltimore: $7,506

Average Healthy Homes Intervention Cost Per Family

Tier I: $662 Tier II: $1,820 Tier II (w/lead hazard reduction): $7,947

Cost-Savings Based on Reduced Tertiary Costs (ED visits, hospitalizations)

- Examples: $53,000; $48,300; $48,000 in medical cost savings (12 months post intervention for prior high medical utilizers)
- HUD Healthy Homes Technical Studies Grant (partnership with UMBC Hilltop Institute to analyze pre and post medical cost savings; comparative evaluation of program clients with Medicaid control group using CMS data; comparative analysis of varying Healthy Homes intervention levels)

Outcomes - Impact and Benefits of GHHI

- Unit production is underway with over 4,600 GHHI units completed and 3,000 units in pipeline - initial goal was 3,500 units
- Corporate, philanthropic, and private resources have committed over **$62 million** to support local GHHI efforts
  - ✓Health and Safety Benefits - 67% reduction in asthma episodes – increasing school attendance, lowering missed work days for parents, and reducing medical costs
  - ✓Energy Consumption reductions ($404/year per home)
  - ✓Government Program cost savings (up to 20 to 25%)
  - ✓Creation of a Single Portal of Intake and Comprehensive Assessment saving work days for clients and generating cost efficiencies
  - ✓Reduction in Lead, Healthy Homes, WAP and other program deferrals

GHHI Baltimore Leverage Funding Sources

- HUD Healthy Homes Demonstration and Production Grants
  (not long term sustainable funding source)
- Community Development Block Grant Program (CDBG)
- Community Service Block Grant Program (CSBG)
- Consumer Investment Funds (PSC)
- Foundation Funding (Annie E. Casey Foundation, Open Society Foundation, Osprey Foundation, Constellation Energy Foundation)
- Baltimore City Housing Rehabilitation Program
- GHHI Partners (Rebuilding Together)
- DOE Weatherization Innovation Pilot Program Grant
- DOE Weatherization Assistance Program/MEA Programs (DOE 11-6 Policy Guidance/ASHRAE Ventilation Standards)
- HUD Lead Hazard Reduction Demonstration Grant/Maryland DHCD Rehabilitation and Lead Programs

Challenges and Opportunities – Payment Models

- Currently no standard set of HH measures and approved costs for Healthy Homes services – Now working on an Medicaid/ACA guidance manual
- Reimbursement traditionally only for licensed clinical providers – Change to Medicaid went into effect Jan 1, 2014, allowing services **recommended** by licensed health providers, but carried out by others, to be reimbursed
- Developing Maryland Healthy Homes Medicaid Pilot Project for asthma
- Demonstrate how GHHI model more cost effectively delivers services and interventions that not only benefit client but also reduce medical costs (asthma, household injury) for government/MCOs/private insurers
- Health Impact Bonds – e.g. Fresno, $3 million investment for 1100 asthma patients, caused 30% reduction in ED visits, 50% reduction in hospital stays
- Hospital Community Benefit Investments - can encompass "physical improvements and housing" and "environmental improvements"
- Education Funding Connections - Costs school districts $29 per child per school absence (14 million asthma related school absences annually) – In GHHI HHTS, linking housing interventions with school attendance rates

Green & Healthy Homes Initiative™

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Reducing Asthma Disparities: Baltimore's Successful Replication Effort

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Kate Scott, RN, MPH
Madeleine Shea, PhD
January 17, 2014

Childhood Asthma Disparities in Baltimore

- Asthma Prevalence - 2007[1]
  - 20% of children <18 years old
  - 28% of high-school students in Baltimore City

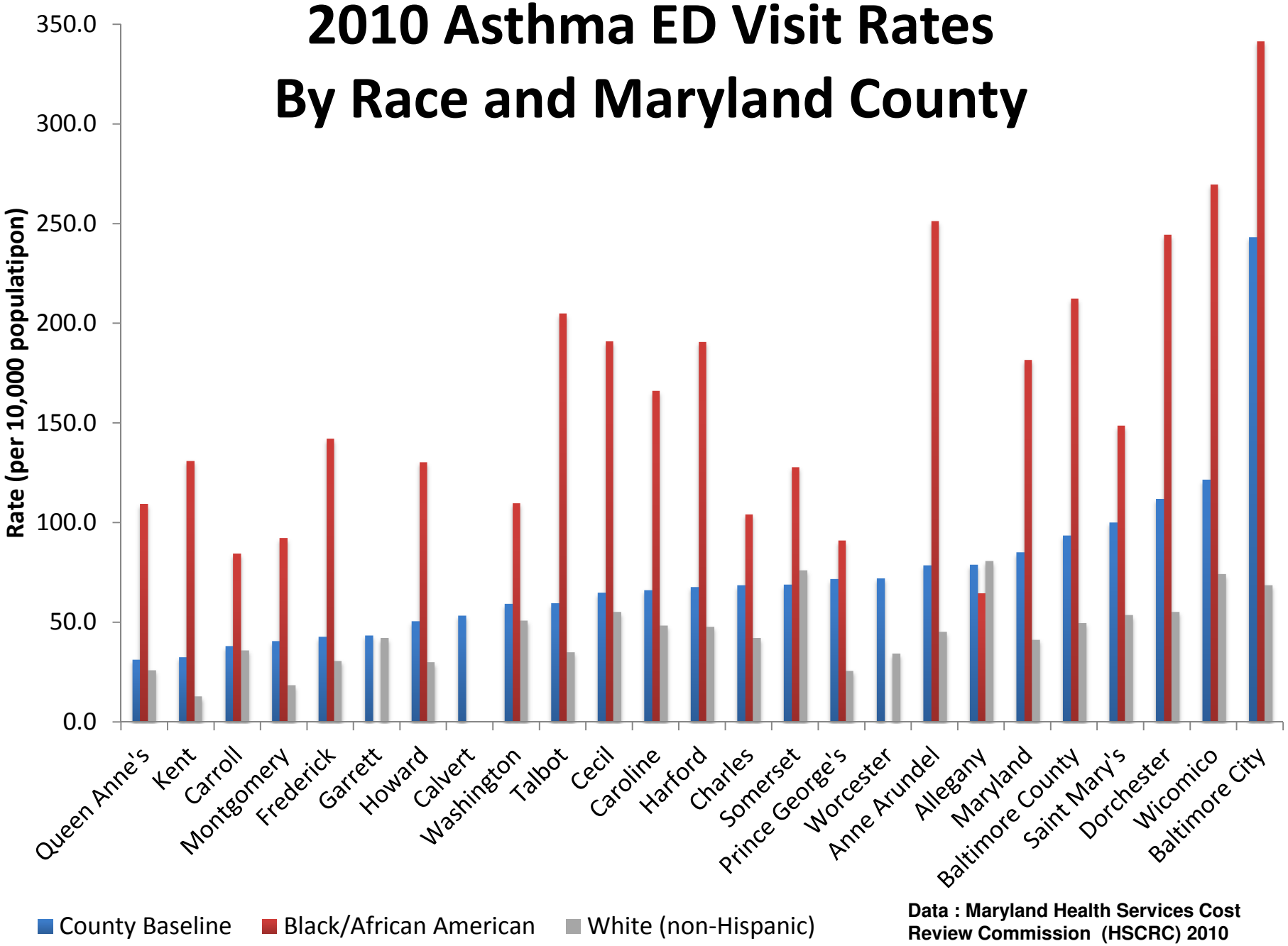
- Asthma ED Rates, <18 yrs - 2009[2]
  - Black = 360.2 / 10,000
  - White = 136.1 / 10,000

- Asthma Hospitalization Rates, < 18 yrs - 2009[2]
  - Black = 50.7 / 10,000
  - White = 25.4 / 10,000

[1]Centers for Disease Control. 2007 Youth Risk Behavior Survey. Available at http://www.cdc.gov/HealthyYouth/yrbs/index.htm.

[2]Maryland BRFSS, 2000-2009; Maryland HSCRC 2009;

2010 Asthma ED Visit Rates By Race and Maryland County



Data : Maryland Health Services Cost Review Commission (HSCRC) 2010

Other Disparities in Baltimore

- Children living in poverty [1]
  - 29.4% - Baltimore
  - 11.3% - Maryland
  - 20.7% - US
  - 62% of Baltimore's children live below 200% of the poverty line
- Smoking - 2008[2]
  - 28% Baltimore City residents
  - 36% of households earning less than $25K/yr
- Housing
  - Old: 58.5% built before 1950[3]
  - Poor condition: 24% with leaky roofs[4]
  - Mice/rats – 37.2%[5]
  - Cockroaches – 16.2%[5]

[1] http://www.city-data.com/poverty/poverty-Baltimore-Maryland.html.;
[2] Baltimore City Health Disparities Report Card
[3] American Community Survey - 2010
[4] Breysse, P et al, Environmental Research, Vol 98 (2), 2005
[5] 2009 Baltimore City Community Health Survey

Reducing Asthma Disparities (RAD) Program Model

- Target Population:
  - 4-18 year olds with moderate to severe asthma
  - Attending Baltimore City Public Schools
  - 236 enrolled, 128 completing 1-year visit
- Program operation: May 2008 – March 2012
- Translation of Seattle-King County's model
  - CHWs providing most visits
  - Community/Public Health Nurse (RN) providing coordination and oversight
  - 6 home visits over 6 months + one year follow-up

Program Model - continued

- Program elements:
  - Medication and technique review
  - Identification of asthma triggers
  - Trigger reduction education
  - Coordination with providers
- Goals :
  - Reduce
    - asthma symptoms
    - use of urgent health services
    - exposure to asthma triggers
  - Improve
    - family knowledge and skill to manage child's asthma
    - communication between families and providers
    - provider knowledge of the home environment

Data, Data, Data!

- Data collection:
  - Interview and Home Environmental Assessment
  - Completed at enrollment and one-yr evaluation

- Encounter form assessment on all visits:
  - Reported symptoms
  - Coordination of care
  - Medications and technique
  - Protocols addressed
  - Problems identified and solutions
  - Goals and next visit date and time

Basic Demographics at Baseline - 1

Baltimore (PH Program)

- Completed = 128
- Av. Child age = 8.8
- Males = 57.8%
- Race/Ethnicity:
  - 3.1% White
  - **94.5% African American**
  - 0.0% Vietnamese
  - 0.8% Other Asian
  - 0.8% Hispanic
  - 0.8% Other
- Family size = 4.4
- # with asthma = 2

Seattle – 1999-2000 (RCT)

- Completed = 214
- Av. Child age = 7.4
- Males = 58.7%
- Race/Ethnicity:
  - 16.8% white
  - **29.9% African American**
  - **28.8% Vietnamese**
  - 7.5% Other Asian
  - **17.3% Hispanic**
  - 4.7% Other

Basic Demographics at Baseline - 2

Baltimore PH Program

- Caregiver Education:
  - < High School = 29.5%
  - HS Grad – 41.0%
  - Some College – 24.6%
  - College Grad – 4.9%
- Renting = 79.0%
- Ped Asthma CQOL = 5.5
- Pet in home = 38.3%
- Roaches = 51.6%
- Rodents = 67.2%
- Caregiver smokes = 30.5

Seattle 1999-2000 (RCT)

- Caregiver Education:
  - < High School = 39.3%
  - HS Grad – 26.6%
  - Some College – 26.2%
  - College Grad – 7.9%
- Renting = 82.2%
- Ped Asthma CQOL = 4.3
- Pet in home = 22.9%
- Roaches = 17.8%
- Rodents = 1.9%
- Caregiver smokes = 23.4%

Baltimore - Reported Changes

Measure	Baseline %	Follow-up %
Asthma Action Plan (AAP)		
Family has AAP	33.6	72.7
School has AAP	18.0	48.4
Other caregiver has AAP	12.5	23.4
Caregiver used plan	10.2	32.0
Uses spacers most/all time	68.0	77.9

Baltimore – Reported Changes

Measure	Baseline %	Follow-up %
Child has peak flow meter	23.8	72.8
Used PFM during last attack	20.8	37.7
System for changing meds - most of the time	12.4	28.0
In last year: Child's asthma is better	37.9	76.2
Child's asthma is worse	26.6	3.2

Pediatric Asthma Caregiver Quality of Life

Measure	Baseline Mean (95% CI)	Follow-up Mean (95% CI)
Overall score	5.45 (5.22-5.68)	6.47 (6.30-6.64)
Activity Domain	5.34 (5.06-5.61)	6.42 (6.21-6.62)
Emotional Domain	5.49 (5.25-5.73)	6.49 (6.32-6.66)
Children aged 7-17 only		
Overall score	5.67 (5.38-5.96)	6.57 (6.33-6.80)
Activity Domain	5.57 (5.22-5.91)	6.55 (6.30-6.81)
Emotional Domain	5.70 (5.40-6.00)	6.56 (6.33-6.80)

Environmental Exposures

Measure	Baseline %	Follow-up %
Pets in the home	38.3	37.8
Cockroaches – last 3 mos	51.6	40.2
Mice/rats – last 3 mos	67.2	55.9
Cigarettes per day	8.1	8.8
Days smoked/month	24.7	28.9
Smoking inside:		
Always/mostly inside	42.2	26.3
Rarely/never inside	28.9	34.2

Pests in the Home

Measure	Mean Score (95%CI) Baseline	Mean Score (95%CI) Follow-up
Presence in 3 rooms		
Cockroaches (total score 0-6)	1.26 (0.95-1.57)	0.65 (0.46-0.83)*
Mice (total score 0-9)	2.89 (2.43-3.35)	1.32 (1.03-1.62)*
Total Seen in 3 rooms		
Mice	3.39 (2.57-4.20)	1.93 (1.31-2.55)*
Rats	0.13 (0.02-0.23)	0.06 (-0.16-0.13)

Provider Communication

Measure	Baseline % all the time	Follow-up % all the time
Treated you with respect	74.8	79.6
Listened to you	70.1	78.0
Explained so you understood	63.0	75.6
Told you when to return	76.4	84.3
Spent enough time	64.6	77.2
Tried to manage asthma	52.0	71.4
Asked if you had questions	69.1	79.4
You asked question	56.7	76.8
Understood what you said	62.7	77.0
Total Score (95% CI)*	**39.1 (38.0-40.3)**	**42.0 (41.0-42.9)**

Self Efficacy

MEASURE	Baseline % very sure	Follow-up % very sure
Know how well child's asthma under control	42.5	83.6
Can detect early signs asthma is worse	63.0	90.6
Can keep child from coughing/wheezing	28.4	71.9
Can keep symptoms from getting worse	53.2	78.1
Know when to use reliever medication	74.0	93.7
Child can take meds as prescribed	85.0	94.5
Know what to do if asthma is worse	86.6	96.1
Can ID things that set off asthma	50.0	85.2
Can ID things that set off asthma outside	50.4	82.0
Can get questions answered by doctor	75.6	94.5
Can understand what doctor tells you	82.7	94.5
You can take care of child's asthma	73.2	93.8
Mean self efficacy score (total)*	17.4	13.6

Mean Reported Changes in Symptoms

Mean # events/last 14 days	Baseline	Follow-up	Change
Days with symptoms	3.5	1.8	↓1.7 days*
Days with activity limitations	2.9	0.8	↓ 2.0 days*
Nights with symptoms	3.5	1.6	↓ 1.9 days*
Days used rescue meds	4.6	2.1	↓ 2.6 days*
Days used controller meds	9.0	9.8	↑ 1.3 days
Reported ED visits (last yr)	2.52	1.47	↓ 1.0 visit*
Reported hospitalizations (last yr)	0.46	0.28	↓0.22 visit**

*$p \leq 0.0001$; **$p = 0.032$

Reported ED Visits and Hospitalizations

- 22 fewer hospitalizations**
  - # Hospital stays at baseline = 56
  - # Hospital stays at follow-up= 34
  - Average asthma hospitalization cost: **$7,866**

- 129 fewer ED visits*
  - # ED Visits at baseline = 310
  - # ED Visits at follow-up = 181
  - Average asthma ED visit cost : **$772**

Change in mean number of **ED visits** - ↓ **1.0 visit***
Change in mean number of **hospitalizations** - ↓ **0.22 visit****

*p=<0.0001 **p=0.023

Total RAD Program Costs = **$1,386.14/case**

- **SUPPLIES AND EQUIPMENT (Variable Cost) = $291.95/case**
  - IPM Kit
  - Green Cleaning Kit
  - Bedding Encasements
  - Equipment - mat, trash can, vacuum, air filter (1/3 of homes)

- **ANNUAL OVERHEAD COSTS (Fixed Cost) = $176.79/case**
  - Rent/utilities
  - Office supplies
  - Transportation
  - Parking stickers
  - Asthma educational materials

- **PERSONNEL COSTS (includes fringe) $917.40/case**
  - Scheduling/visit coordination: 4 hours
  - Community Health Worker: 30 hours
  - RN supervision: 6 hours

Cost Savings Analysis

Comparison: 1yr before to 1yr after enrollment

- Costs averted (hospitalizations & ED visits)
  - $272,640 ($2,217/child)
- Home visiting program costs
  - $170,478 ($1,386/child)
- Potential cost-savings for third-party payers
  - $102,162 ($831/child)

Challenges and Opportunities

- RAD funding ended 2012 – program not currently funded
- Met with stakeholders to discuss results
  - Findings met with interest
  - No additional funding secured
- Baltimore City Health Department offers shorter program to interested families who have a child with asthma

Thank you!

- Brandi Sanders, Carla Hardy, and Tyra Pierce, Community Health Workers
- Melissa Luke, Referral Coordinator
- Carol Kawecki, RN and Dottie Freeman, RN, Program Mangers
- Ida Ganao, Data Manager
- Pat Breysse, PhD and Greg Diette, MD, co-investigators
- Deborah Greenberg, MA, Research Analyst
- Centers for Disease Control and Prevention

Questions?

Community Asthma Prevention Program: Closing the Circle of Care

Tyra Bryant-Stephens, MD, Director and Founder of the Community Asthma Prevention Program of Philadelphia
The Children's Hospital of Philadelphia

CAPP History

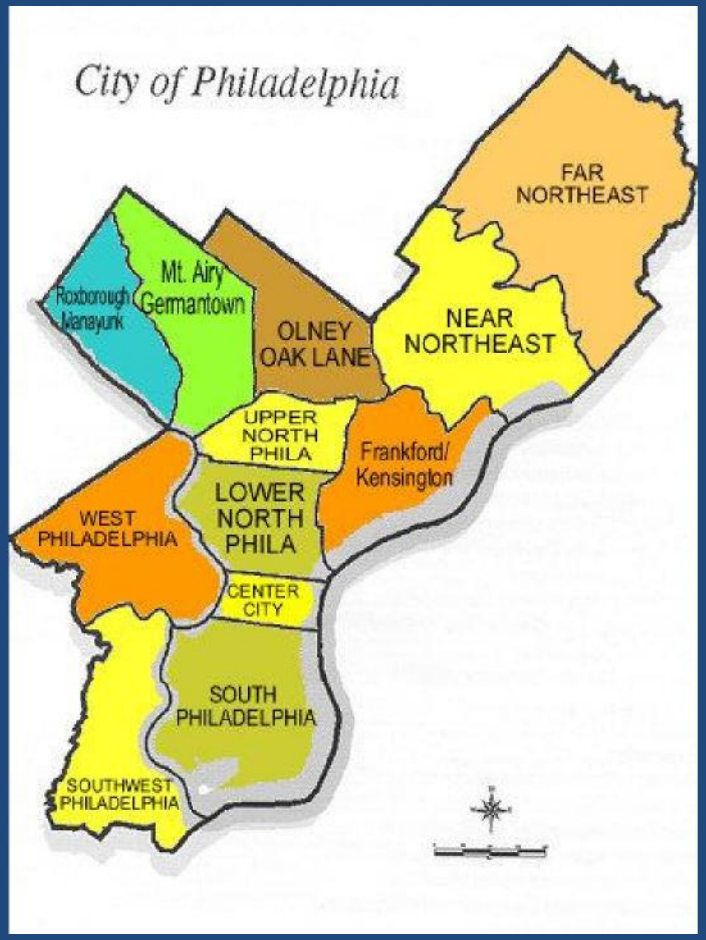
- Founded in 1997
- Premise: Despite medical advancements, children in West Philadelphia urban primary care practice continued to go to the ED and hospital for asthma exacerbations
- Clearly a gap existed between medical management and self-management behavior

Goals of CAPP

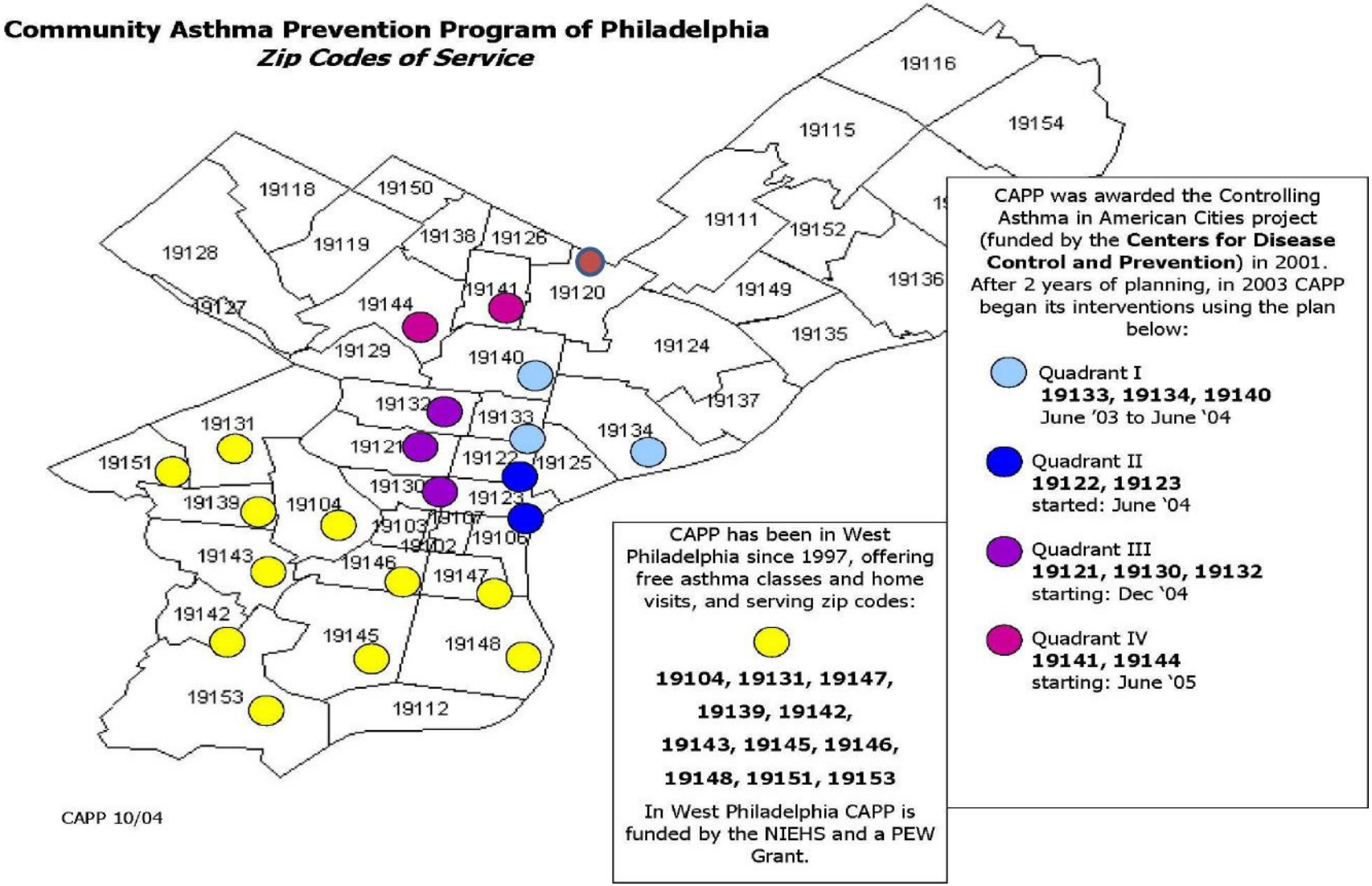
- To increase asthma knowledge and improve asthma self-management behavior
- To improve quality of life for children with asthma
- To equip members of the community to become neighborhood asthma experts
- To promote asthma-safe home and school/child care environments;
- To reduce burden of asthma on disparate populations

Target Populations

- West, Southwest, South, and North Philadelphia
- Urban, poor, predominately African-American and Latino communities



CAPP's Outreach from 1997- present



CAPP Building Blocks

CAPP Collaborative Partners

Community Groups

- Philadelphia Allies Against Asthma
- Germantown Settlement
- Congreso de los Latinos Unidos
- Beloved St John Evangelistic Church
- YMCA- Columbia North
- Casa Del Carmen
- Children's Services, Inc
- Habitat for Humanity
- CAPP Collaborative
- CAPP Community Advisory Board

Hospitals

- Children's Hospital of Philadelphia
- Temple Children's Hospital
- Thomas Jefferson Hospital
- Albert Einstein Hospital

Managed Care Organizations

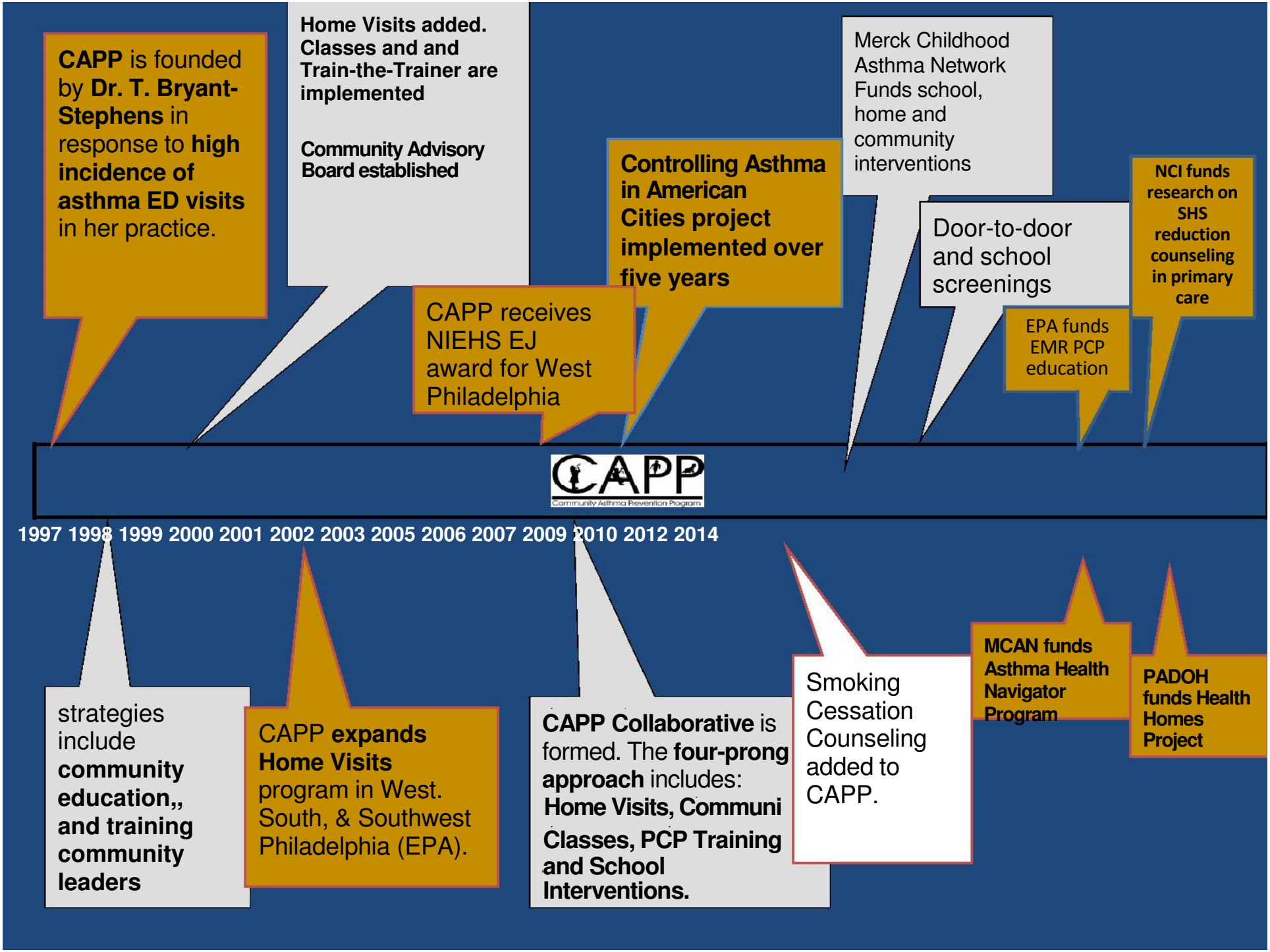
Health Partners

Keystone Mercy Health Plan

- The School District of Philadelphia
- US EPA, Region 3
- Pennsylvania Dept of Health
- Pennsylvania Asthma Partnership
- Health Promotions Council
- Philadelphia Health Management Corp

HealthCare Providers

- Temple Health Connections
- Philadelphia Department of Health
- Maria de los Santos
- Fairmount Health Center
- Children's Hospital of Philadelphia CARE Network


CAPP is founded by **Dr. T. Bryant-Stephens** in response to **high incidence of asthma ED visits** in her practice.
Home Visits added. Classes and and Train-the-Trainer are implemented
Community Advisory Board established
CAPP receives NIEHS EJ award for West Philadelphia
Controlling Asthma in American Cities project implemented over five years
Merck Childhood Asthma Network Funds school, home and community interventions
Door-to-door and school screenings
EPA funds EMR PCP education
NCI funds research on SHS reduction counseling in primary care
CAPP
Community Asthma Prevention Program
1997 1998 1999 2000 2001 2002 2003 2005 2006 2007 2009 2010 2012 2014
strategies include **community education,, and training community leaders**
CAPP **expands Home Visits** program in West. South, & Southwest Philadelphia (EPA).
CAPP Collaborative is formed. The **four-prong approach** includes: **Home Visits, Communi Classes, PCP Training and School Interventions.**
Smoking Cessation Counseling added to CAPP.
MCAN funds Asthma Health Navigator Program
PADOH funds Health Homes Project

Types of Community-Based Interventions over 14 years

- Community asthma self-management education
- Individual home asthma self-management education
- Home environmental remediation
- Primary provider education
- School professional education
- School student education
- School screening
- Door-to-door screening
- Community evaluation
- Asthma navigators

Home Environmental Interventions for Children with Asthma

- CAPP delivers environmental interventions in homes by:
  - Training CHWs recruited from the community to deliver in-home evidence-based asthma education and environmental mitigation
  - Reviewing symptom diaries with patients to help better manage asthma
  - Promoting self-management of environmental exposures by demonstrating medication use, asthma devices, trigger avoidance techniques, reviewing AAPs and connecting families to resources

Evidence-based Home Environmental and Education for Children with Asthma Coordinated through:

- Referrals from CHOP's patient database, community primary care providers and school nurses to identify high-risk children
- Closely spaced interventional home visits initially then at least monthly visits for one year
- Evaluation of improved ability to self-manage asthma, visual assessments of the home environment and tracking health care utilization for enrolled children
- Feedback to clinical providers

Home Environmental Intervention Methods

- Assessment of child's bedroom and general living areas
- General asthma education provided including AAP, proper use of devices and medication
- Parents taught how to make simple environmental interventions in child's bedroom and general living area
- Supplies given to facilitate interventions
- Inspection of rooms at f/u visits
- Education reinforced at each visit with teach back

Before

After

Changes made from intervention

- Mattress and Pillow Covers Used
- Clothing and toys placed in rubber bins
- Tile replaced worn carpet

CHW Training

Training Community Health Workers

- Overview of CAPP and specific project
- Basic Asthma Knowledge
- Skill building-asthma devices
- Teaching Techniques
- Mock teaching from Lesson Plans
- Scenarios encountered in the Home
- Protocol for project

CHW
Ongoing Training and Monitoring

1)Monthly data meetings

2)Demonstration of lesson for peer review

3)On-site observation

4)buddy visits

5)independent visits

6) monthly booster sessions

Evaluation

CAPP Logic Model for Home Visits

Activities	Initial Outputs	Short-Term outcomes	Long Term Outcomes
• Train CHWs to deliver home-based asthma education, environmental home assessments and trigger mitigation	• Number of children with poorly controlled asthma receive home educational and environmental mitigation visits • Number of children with AAPs that include trigger identification	•Improved self-management of medications and home environment •Reduced exposure to environmental triggers	• Increase in QOL as measured by increased symptom free days • Reduced ED visits and hospitalizations

Status Home Environmenta l and Education Interventions

- Six home visitors trained. Most retained for at least 5 years.
- Over 2000 families participated in Home Visit Program
- Average retention for 6 month projects- 95%
- Average retention for 12 month projects-87%

Home Asthma Ed ucation and Environmental Intervention

Demographics of Home Visit Families n=339 children, n=256 families	
	Mean
Age	7.4 years, ± 4.2
Sex	54.0% male
Race	85.8% African American
Ethnicity	8.8% Hispanic

Home Asthma Education and Environmental Intervention Outcomes

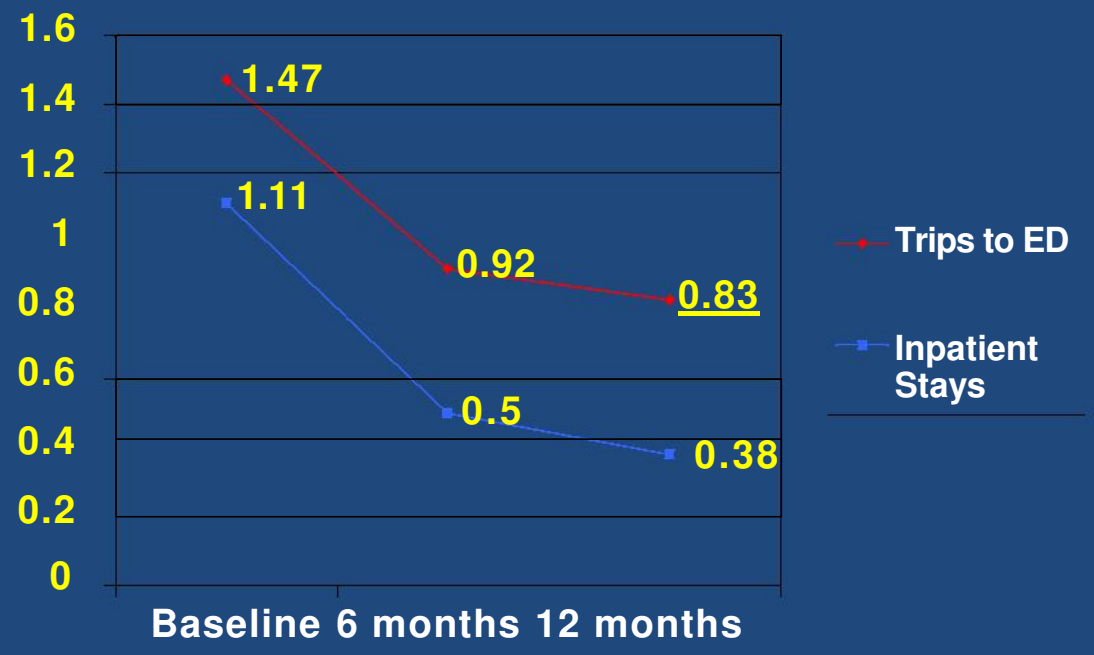
Paired Analysis n=208	Baseline	12 month	p-value
ED visits last 12 months	2.04(±1.43)	1.04(±2.1	<0.05
Hospitalizations last 12 months	.90(±2.11)	0.39(±1.0	<0.05
Missed school for any reason	7.13(±11.47)	6.13 (±7.97)	0.49
Missed school for asthma	5.85 (±10.46)	4.02 (±6.44)	<0.05

Home Asthma Education and Environmental Intervention Outcomes

Paired Analysis n=208	Baseline	12 month	p-value
# of days using rescue meds	3.72 (±4.58)	2.18 (±3.55)	<0.05
# of days with symptoms	3.17(±4.25)	1.71(±2.92)	<0.05
# nights with symptoms	2.82 (±4.22)	1.44 (±3.29)	<0.05
# of days child slowed down because of asthma	2.90 (±4.83)	1.00 (±2.13)	<0.05

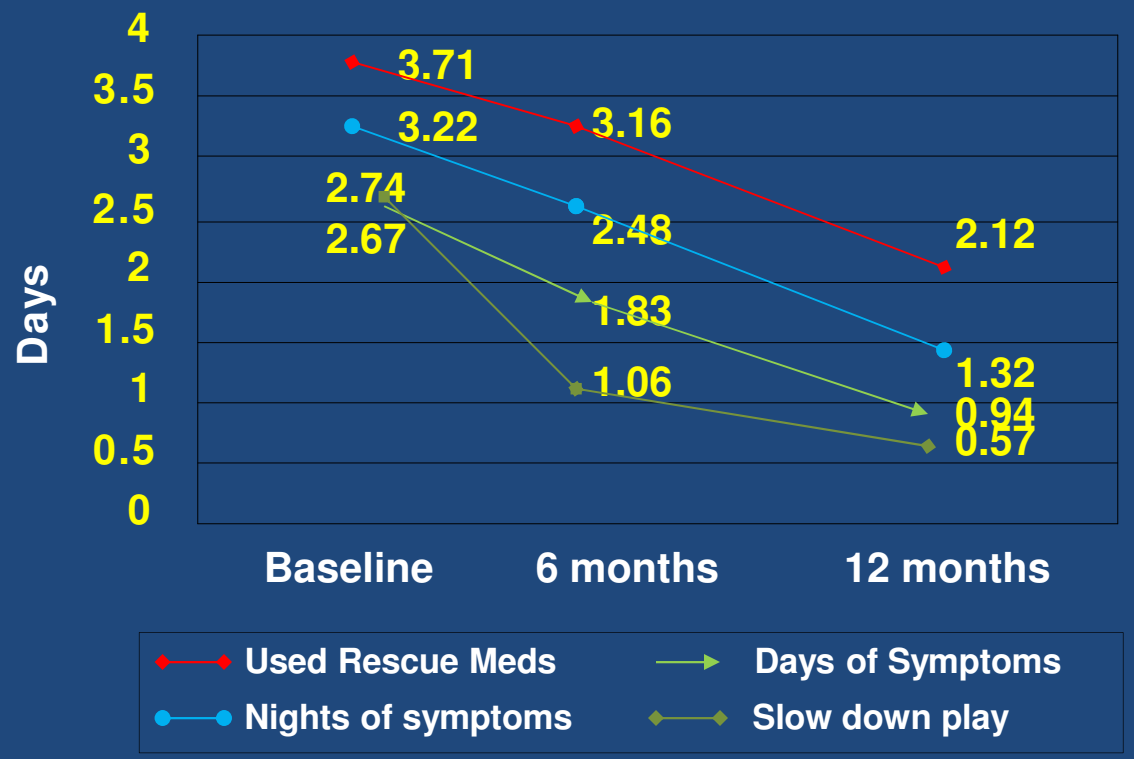
Home Asthma Ed ucation and Environmental Intervention Outcomes

In Past Year:



Home Asthma Education and Environmental Intervention Severity Change

In Past Two Weeks:



Lessons Learned

Lessons Learned

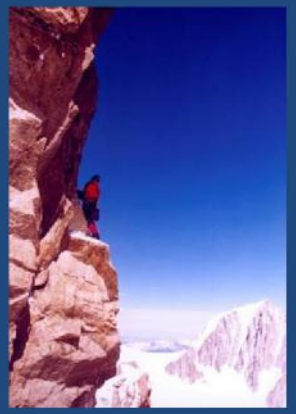
- CHW's are skilled and effective recruiters for the project
- CHW's can build valued supportive relationships with caregivers
  - Establish boundaries for CHW's and clients
  - Educate CHW's about legal ramifications
  - Important to recruit CHW's who have some experience in building relationships with clients

Lessons Learned

Lessons Learned

- Data collection has to be monitored closely
  - Review essential data elements consistently
  - Create script for CHW's when asking questions
  - Have CHW's monitor each other at monthly/weekly meetings
  - Do random chart checks
  - Create punch list for data entry clerk
- Expectations must always be inspected

Challenges



- Infrastructure
- Field supervision
- Data Collection
- Safety challenges
- Monitoring/Documentation of Daily Activities
- Sustainability

Cost Information

- Environmental Supplies- range from $50-$200. Budgeted at $100/family
- Cost/patient- $500 (JNMA 2008)
  - Includes salary and supplies
- Approach to sustainability
  - Implementing new Medicaid/CHIP rule in Pennsylvania
  - Discussions with payers in PA with CPT codes

Questions?

District of Columbia Healthy Homes Partnership

Pierre Erville, Associate Director
Lead and Healthy Housing Division

January 17, 2014

Scope of Problem

- 30% of District children live in poverty[1]
  - Highest rates in Wards 7 and 8
- 17% of District children live with asthma[2]
  - Causes > 350 annual child hospitalizations[2]
  - Leading cause of ED visits[2]
  - Primary reason for school absences[2]
  - Highest prevalence in Wards 7 and 8 (~25%)

[1] US Census Data, 2012; [2] DC Department of Health

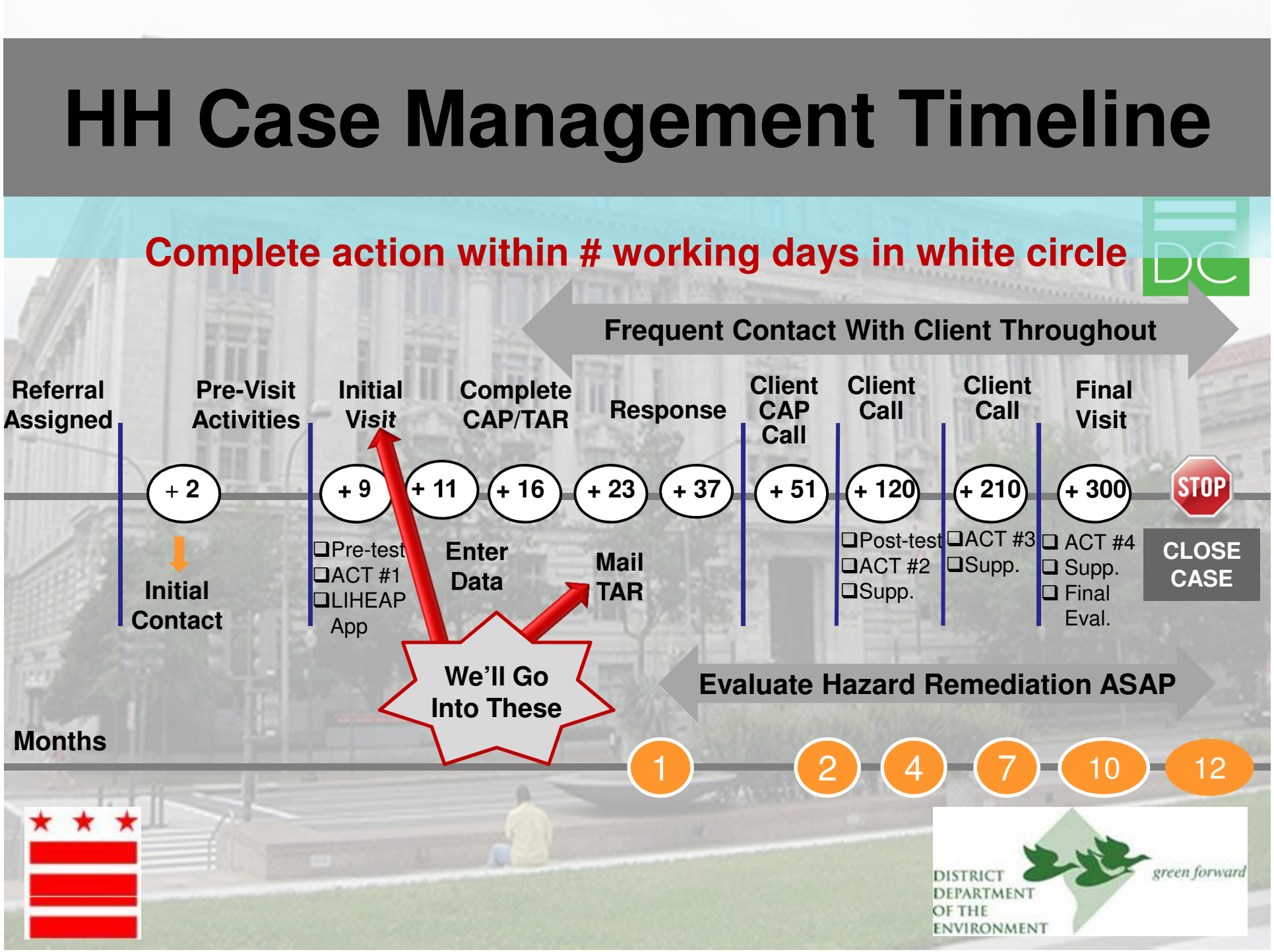
Healthy Homes Partnership

- Sister agencies and private providers
- Two main referral types:
  1. Primary Prevention Referrals: Sister agencies trained to ID HH candidates, w/ children < 6 years
  2. Asthma Referrals: Private healthcare providers, including IMPACT DC, Children's National Medical Center, Health Clinics, and HSCSN, referring individuals less than 18 years old

About Our Referrals

- Majority of asthma referrals reside in **Wards 7 and 8**
- Half the asthma referrals live in either **subsidized or public housing**
- Indoor asthma triggers typically found: **pests, mold, dust, env'l smoke**

HH Case Management Timeline



Initial Visit + Office Work

- Certified Healthy Homes (HH) Specialist conducts **home assessment** with Energy Program Auditor (oversees LIHEAP app)
- Specialist administers **Asthma Control Test** (ACT) and pre-test re HH basics; provides customized HH education / supplies; creates Technical Assistance Report and Care Plan

Technical Assistance Report

Today's Date

Dear Owner :

The following Healthy Homes report is based on an environmental assessment conducted on date/2014 at the following address: address

This report includes a list of environmental hazards identified at this property by a District Department of Environment (DDOE) environmental health specialist. The presence of these hazards places the occupants at significant risk of exposure. These environmental health threats may already be negatively affecting an occupant's health.

DDOE strongly encourages the property owner to take the measures recommended in this report and to eliminate identified hazards in an appropriate timeframe. The Lead and Healthy Housing Division is always available to answer questions, and is able to provide technical assistance, if desired.

We look forward to working with you to address the problems brought to your attention. Please be aware that the issues this report identifies may also represent housing code violations. While currently no enforcement action is being taken against the property owner on any of these issues, it is important for the property owner to address them promptly. ***Any hazards identified in this report that are not addressed within the report's recommended timeframe will be referred to the D.C. Department of Consumer and Regulatory Affairs for further review. Be aware that a failure to address code violations in the appropriate timeframe may result in immediate fines for civil infractions.***

Thank you,

Technical Assistance Report

Healthy Homes Environmental Hazard Assessment

Address	
Owner/ Management Company on Record	
Assessment Date	
Property Type	**Owner-Occupied, Rental Property, Public Housing, Subsidized Rental Property, Other: _____**
Structure Type	**Detached, Single Family, Townhouse/Row House, Multi-Unit Complex, Other: _____**

Hazard Assessment Summary:

Room ID #	**Hazard ID #**	**Hazard Description**	**Potential Health Risk**	**Suggested Corrective Measure**	**Recommended Time Frame for Correction**

Attach:

Photos (date stamped, with captions including Room and Hazard ID #)

Property Schematic showing each Room ID #

Care Plan

Program Approach Re: Property Owner

- Initial approach as **consultant**
  - Provide TA & grant info / Oversee interventions
- If needed, as **enforcement agent**
  - Referral to Code Enforcement partner
- And potentially, as **protector of tenant rights**
  - Referral to Office of Tenant Advocate (partner)

Public / Subsidized Housing

- Public/subsidized housing cases trigger communication with Housing Authority
- Case managers oversee ongoing follow-up with Housing Authority (HA) as needed
- Result: greater HA awareness of impact of HH issues and how to address them

Case Management

- Real-time communication with PCP
- Quarterly administration of ACT
- Multiple home visits, w/calls to landlord
- Referrals to support services
- Real-time tracking of case status
- Ongoing data collection

Ongoing Evaluation

- Comprehensive/continuous data analysis
  - Real-time QA/QC
    - Enables identification of data gaps and opportunities for increased efficiency
  - Program economic impact
    - Recently launched ACT supplemental form
  - Tracking trends
    - E.g., improved asthma control (ACT #1 - ACT #4)

Challenges/Opportunities

- **Challenges:**
- Some cases lost to follow-up
- Some referrals unwilling to participate

- **Opportunities:**
- **Systemic** changes in HA prop. maint. norms
- **Significant** reduction in asthma triggers
- **Improved** health for asthma patients
- **Reduction** of health disparities

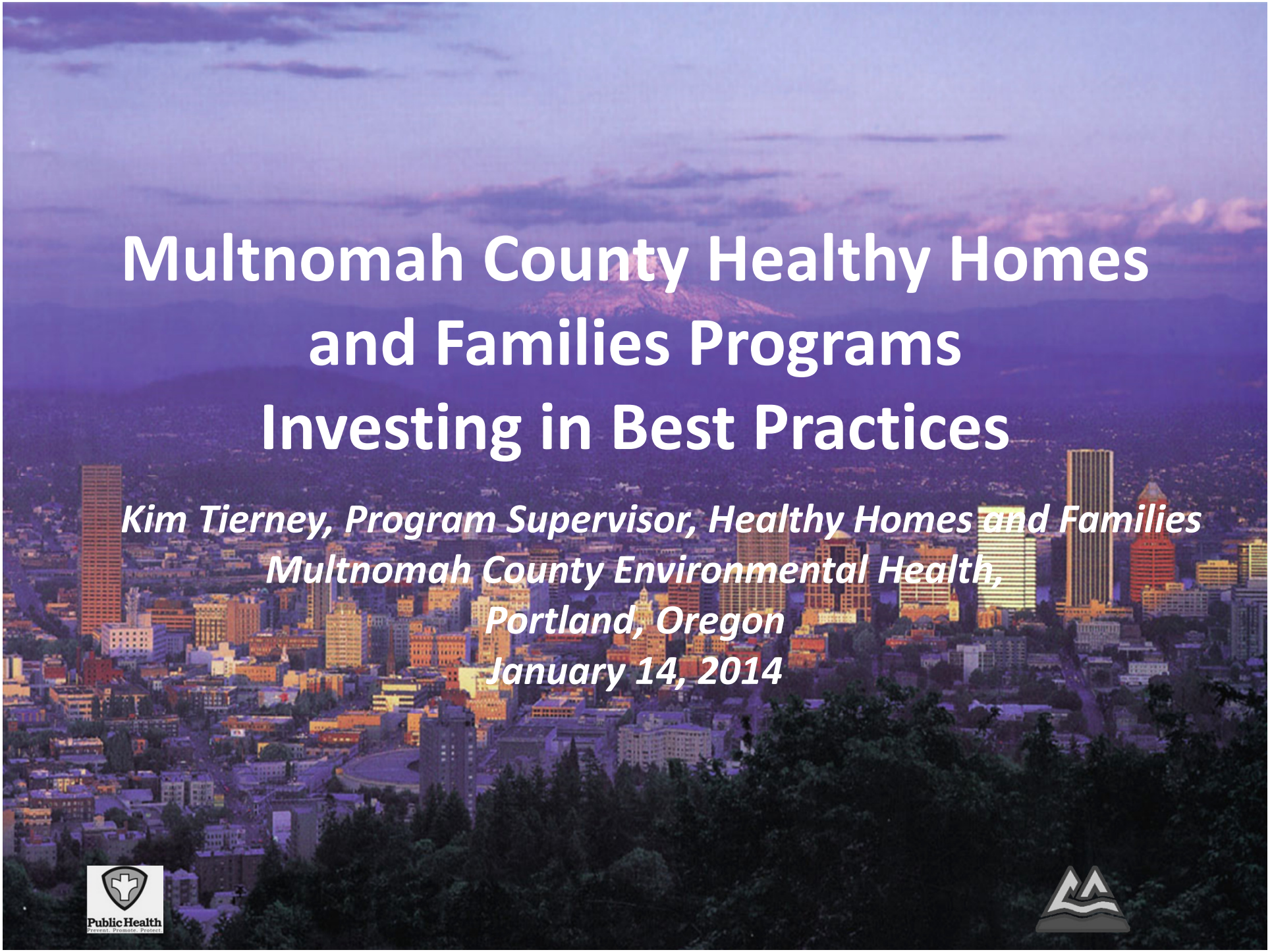
Client Families w/ Mayor & DDOE Director

SUSTAIN ABILITY DC

DISTRICT DEPARTMENT OF THE ENVIRONMENT
green forward

Client Testimonial

http://www.youtube.com/watch?v=sDWvcjM_C2s&feature=youtu.be



Multnomah County Healthy Homes and Families Programs Investing in Best Practices

Kim Tierney, Program Supervisor, Healthy Homes and Families
Multnomah County Environmental Health,
Portland, Oregon
January 14, 2014

Public Health
Prevent. Promote. Protect.

Healthy Homes and Families Programs

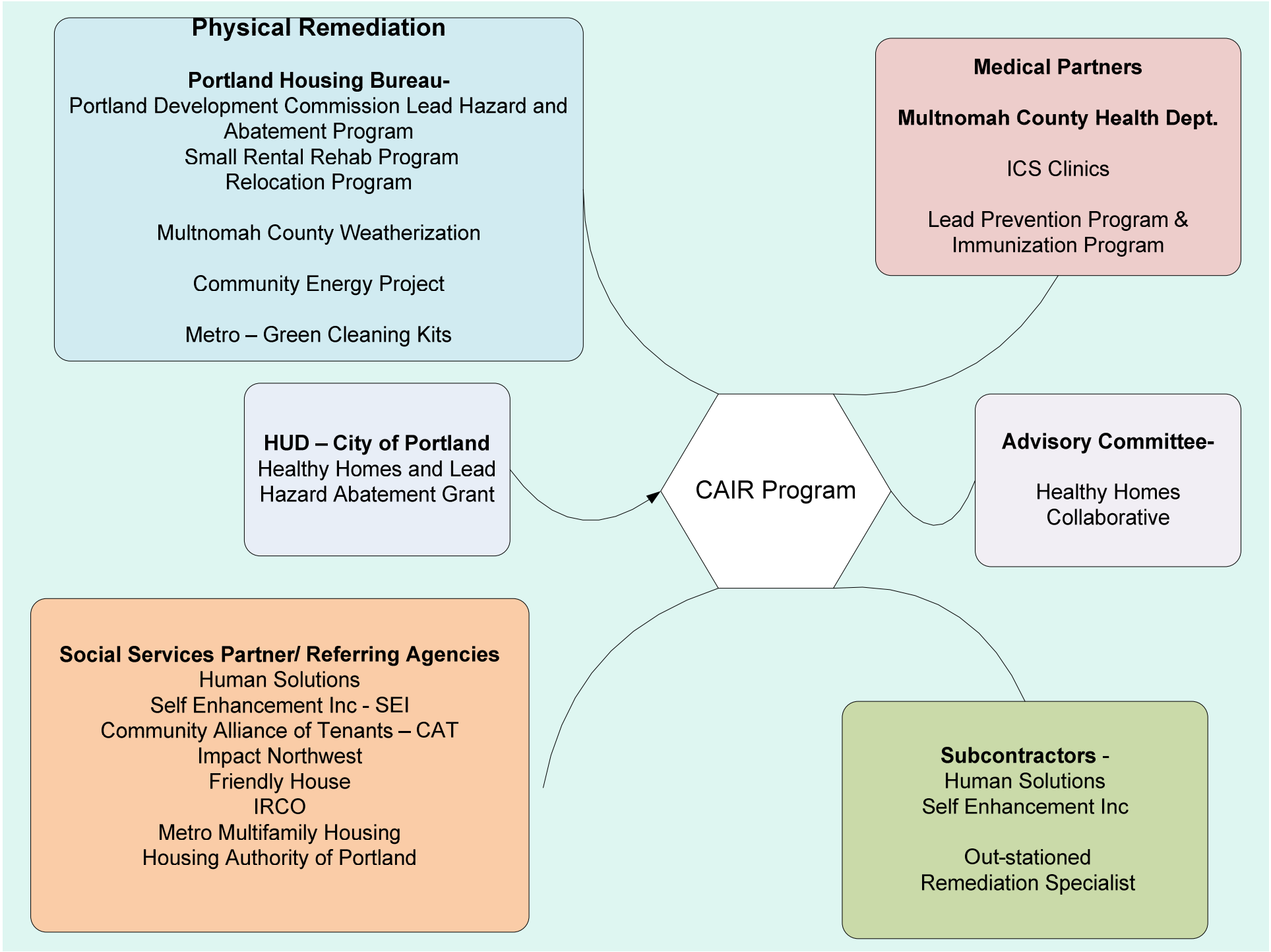
- ***2005 HUD Demonstration Grant - Healthy Homes Asthma Program*** - 6 month nursing case management program serving low income children with Asthma
- ***2009 Asthma Inspection and Referral Program (AIR)*** 2009 – One time visit by EHS with report to families and referring providers – General Fund
- ***2009 Housing Code/ Rental Inspections-General*** Fund
- ***2010 HUD Healthy Homes Demo Grant – CAIR*** – serving children with asthma and other environmentally caused health conditions
- ***Lead Poisoning Prevention Program*** – City/State Grants

CAIR Program

- The CAIR Program was a three year HUD funded Healthy Homes Demonstration program designed to assist low income families with children experiencing health issues related to living in substandard housing conditions.

How was CAIR Unique?

- Out-stationed staff at Community Agencies
- Web based referral and data system
- Partners to provide home repair
- Partners to provide medical homes
- Broader health issues than just asthma
- Team case management through web
- Expanded interventions – Air Quality, Safety, Hazards


Physical Remediation
Portland Housing Bureau-
Portland Development Commission Lead Hazard and Abatement Program
Small Rental Rehab Program
Relocation Program
Multnomah County Weatherization
Community Energy Project
Metro – Green Cleaning Kits
Medical Partners
Multnomah County Health Dept.
ICS Clinics
Lead Prevention Program & Immunization Program
HUD – City of Portland
Healthy Homes and Lead Hazard Abatement Grant
CAIR Program
Advisory Committee-
Healthy Homes Collaborative
Social Services Partner/ Referring Agencies
Human Solutions
Self Enhancement Inc - SEI
Community Alliance of Tenants – CAT
Impact Northwest
Friendly House
IRCO
Metro Multifamily Housing
Housing Authority of Portland
Subcontractors -
Human Solutions
Self Enhancement Inc
Out-stationed Remediation Specialist

Create Sustainable Funding for Healthy Homes Interventions

Goal: Amend the State Health Plan to provide Targeted Case Management reimbursement for Healthy Homes and opportunities for other Health Departments to provide this service

"New Program Highlights Household Asthma Triggers"

PORTLAND, OR 2006-08-10 The Multnomah County Health Department has started a new program to raise awareness about asthma and to help struggling families.

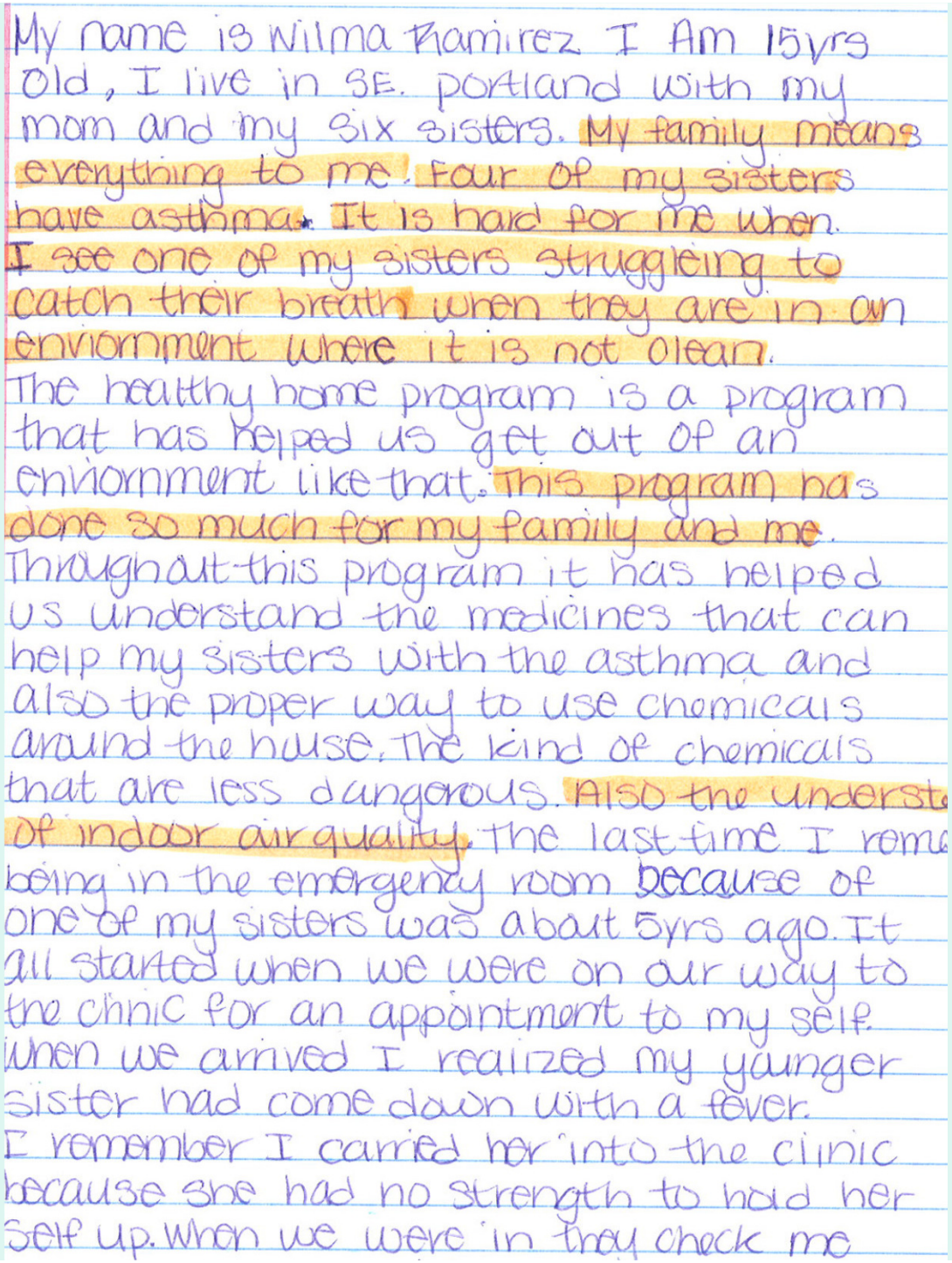
Asthma is becoming increasingly common in the U.S. It's a disease that leaves people wheezing and panting for breath. Those who live in cities are at higher risk, but asthma is growing even faster among minority populations, who often live in older homes and closer to large industrial areas.

Maribel Correa, who moved to the U.S. from Colombia 7 years ago, lives in Northeast Portland with her husband and four kids. Her two youngest have had problems with asthma. Last spring one got sick with a cold.

"It started to fill up his throat and she went to the hospital and they said he had bronchitis, and it had never happened before and she got scared," translates Correa's 11-year-old daughter, Melissa. "They gave her some medicine to give to the kids and in three days it got worse and so she took him to the hospital." Correa says eventually they found out it wasn't bronchitis - it was asthma. Doctors told her that her son's respiration was half the level it should be.

Media Engagement

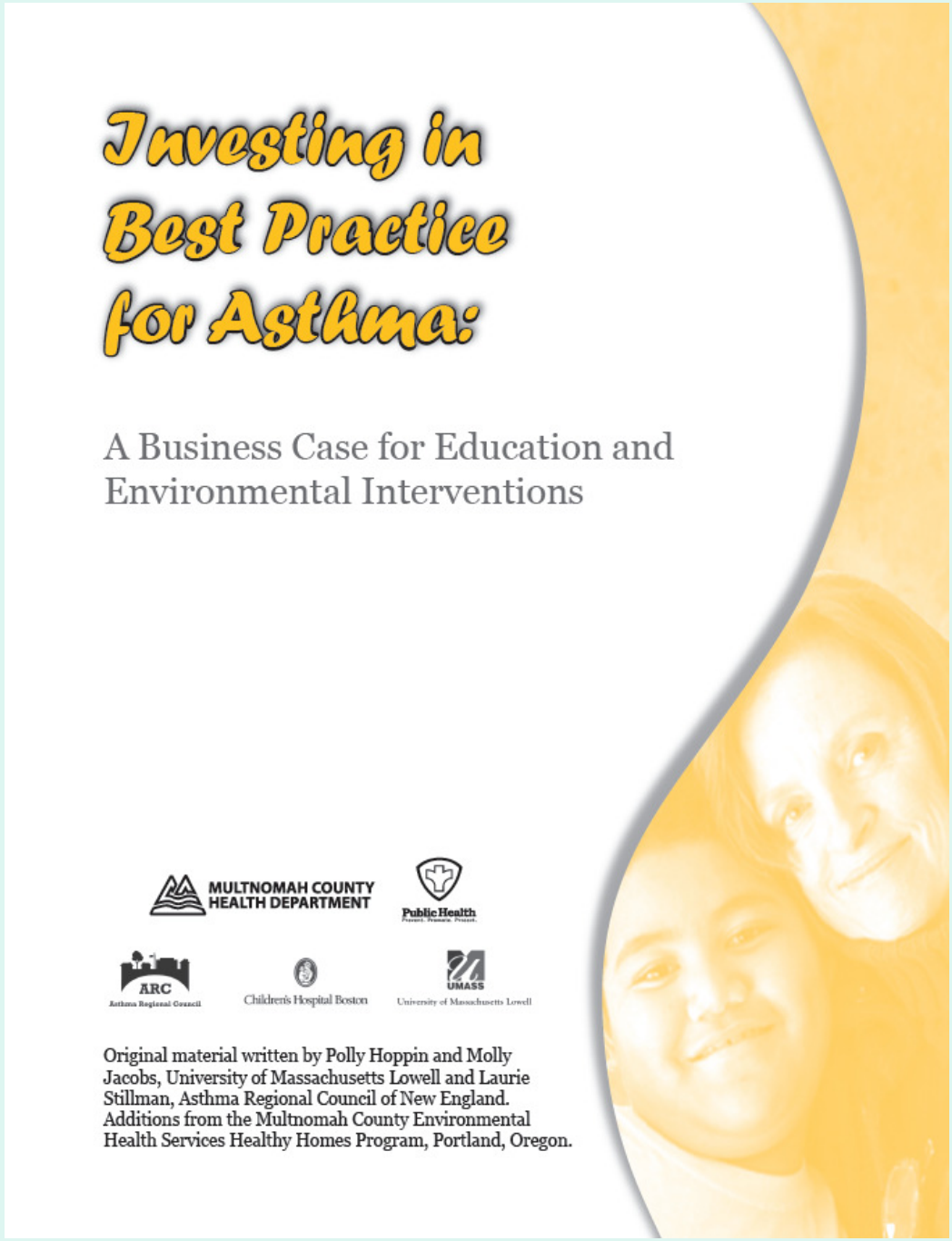
Getting your message out to decision makers and the public.



My name is Wilma Ramirez I Am 15yrs old, I live in SE. portland with my mom and my six sisters. My family means everything to me. Four of my sisters have asthma. It is hard for me when I see one of my sisters struggleing to catch their breath when they are in an enviornment where it is not clean. The healthy home program is a program that has helped us get out of an enviornment like that. This program has done so much for my family and me. Throughout this program it has helped us understand the medicines that can help my sisters with the asthma and also the proper way to use chemicals around the house. The kind of chemicals that are less dangerous. Also the underste of indoor air quality. The last time I reme being in the emergency room because of one of my sisters was about 5yrs ago. It all started when we were on our way to the clinic for an appointment to my self. When we arrived I realized my younger sister had come down with a fever. I remember I carried her into the clinic because she had no strength to hold her self up. When we were in they check me

Public Engagement

Building awareness and support



Direct Advocacy

Educating and influencing decision makers on public policy.

Key steps to sustainable funding

- Research national efforts
- Measure outcomes
- Communicate Return on Investment (ROI)

- Convene and enlist support from:
  - Directors of Managed Care Plans
  - Politicians
  - Champion within Medicaid Program

- Identify key steps to implementing Targeted Case Management

Key steps to sustainable funding

- Develop a plan and timeline and coordinate monthly meetings with DMAP staff.
- Submit a State Plan Amendment (SPA) waiver to Center for Medicaid Services
- Implement immediate time study
- Analyze policy to determine billable activities
- Negotiate rate with DMAP
- Begin TCM!

Targeted Case Management (TCM) Implementation

- Develop TCM Chart Forms/Standards
- Develop Billing System
- Develop Workflow
- Quarterly Time Studies
- Evaluate Program
- Audit Charting
- Revise Productivity down
- Revise Costs upward

TCM Healthy Home - Risk Criteria

Target group: Medicaid eligible children with poorly controlled asthma or a history of environmentally induced respiratory distress which can result in a life threatening asthma exacerbation or exacerbation of respiratory distress.

Risk factors could include, **but are not limited to**:

- (a) Unscheduled visits for emergency or urgent care;
- (b) One or more in-patient stays;
- (c) History of intubation or Intensive Care Unit care;
- (d) A medication ratio of less than or equal to .33;
- (e) Environmental or psychosocial concerns raised by medical home;

TCM Healthy Home – Description of services

Comprehensive assessment of individual needs:

- Taking client history;
- Evaluation of the extent and nature of recipient's needs (medical, social, educational, housing, environmental, including assessment for risk of lead exposure and existence of second hand smoke and other specified asthma triggers and irritants, and other services) and completing related documentation;
- Gathering information from other sources to complete assessment

Development of specific care plan

Monitoring and follow-up activities

Linking/Referral, etc

Reassessment

TCM Healthy Home – Provider Requirements

The case manager must be a licensed Registered Nurse, registered Environmental Health Specialist, Asthma Educator certified by the National Asthma Education and Prevention Program, Community Health Worker certified in the Stanford Chronic Disease Self-Management Program, or worker working under the supervision of a licensed Registered Nurse or a registered Environmental Health Specialist.

Demonstrate Return on Investment Collect Data

- Emergency Room Visits
- Hospitalization
- Medication Ratio
- Change in Environmental Scores
- ACT or TRACK Scores
- Quality of Life questions
- Work or School Days lost

Lessons Learned

Resources for Home Repair CDBG

Medical Homes

Community Partners

Program Income

Underestimating the need

Out-stationed Staff

Difference between CAIR / Healthy Homes

Challenges

- New Technology
- Data Base development
- Enrollment
- Partner timelines
- Community Health Worker scope
- Charting
- Caseload Management
- Landlord Tenant Issues

ER Visits (Closed Cases)

- Healthy Homes – Asthma
- 61 clients total
- 56% No Change
- 5 % Increased
- 39% Decreased
- 2.5 visits saved in 6 months
- 5 visits saved per client/ per year X cost of ER visit
- 122 visits saved over 2 yrs

- CAIR –Asthma and other conditions
- 149 clients total
- 70% No Change
- 7 % Increased
- 22 % Decreased
- 2 visits saved in 6 months
- 4 visits saved per client/ per year X cost of ER visit
- 132 visits saved over 2 yrs

ACT Score Changes

Healthy Homes

- 83% of Cases showed an increase in ACT score
- Average ACT score change was 6.1 for all clients.
- Average ACT score change was 7.8 for all clients whose ACT score improved

CAIR

- 71% of Cases showed an increase in ACT score
- Average ACT score change was 3.7 for all clients.
- Average ACT score change was 6 for all clients whose ACT score improved

Qualitative Questions

	CAIR	HH		OR (CAIR)	CI
1. How would you rate the health of your family	100%	132%		2.3	[0.9-6.1]
2. Housing as the source of illness	-93%	-85%		**13.8**	[2.9-64.5]
3. Emergency room visits for household in the last 6 months (self reported)	-59%	-29%		2.1	[0.8-5.0]
4. Average number of visits in last 6 months	-2.5	-1.9		1.79	[0.7-4.1]
5. Household members had access to health care	61%	0%		**7.5**	[3.5-16.4]
6. Comfort with Landlord	-56%	-29%		**2.7**	[1.1-6.1]

OR is from logistic regression model predicting final scores from program type, controlling for pre scores.

Percents are relative changes from baseline.

In all cases, CAIR has superior results, with Questions 2, 4, and 5 being statistically significant

Questions and feedback:

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503 988 3663 x 22850

http://web.multco.us/health/healthy-housing