



BUILDING A FRAMEWORK FOR HEALTHY HOUSING

A “Business Case” for Asthma Education & Home-Based Environmental Interventions

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Best Practices for Asthma Management: NAEPP/NHLBI Guidelines

1. Lung function measurement
 2. Comprehensive pharmacologic therapy
 3. Control of environmental triggers
 4. Patient education that fosters a clinician/patient partnership
- Less headway made on #3 & #4
 - New guidelines underscore importance of patient education & environmental interventions



Effectiveness of Asthma Education & Home-Based Environmental Interventions on Health Outcomes

- Across risk levels
 - Increased symptom free days & other quality of life measures
 - Improved lung function
 - Reduced use of rescue medications



Challenges to Delivering Asthma Education

- Disease highly complex, requiring tailored education & interventions
- Time in standard office or sick visit insufficient
- Limited coverage for discrete asthma education visits
- Range of providers not reimbursed



Challenges to Delivering Home-Based Environmental Interventions

- Evidence of health effectiveness relatively new
- Lack of awareness among clinicians
- Environmental interventions considered beyond the scope of medical care
- Lack of evidence regarding cost-effectiveness
- Lack of sustainable funding sources

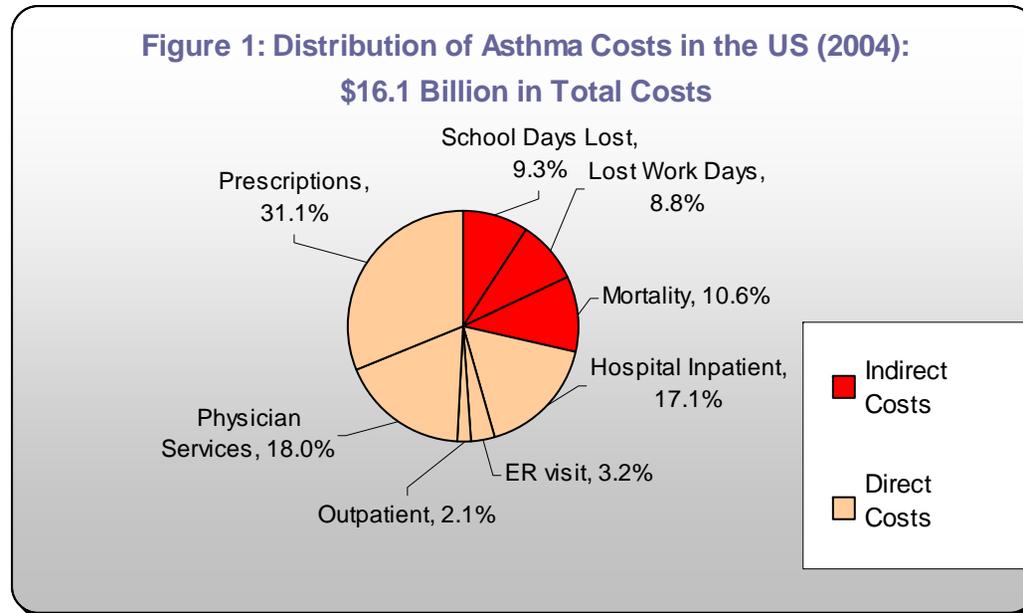


Who Pays for Environmental Interventions and Asthma Education?

- Federal Grants
- State & Local Health Departments
- Some Private Foundations
- Some Health Plans (clinic-based education)



Why Should the Health Sector Care?



- Nationally: Asthma costs over \$16 billion in direct & indirect expenses
- Over 70% of costs borne by the health sector
- Many costs preventable

Establishing a Business Case for Health Care Decision-making

- Are there cost savings?
 - Savings from reduced health expenditures exceed the cost of the program
- Is there cost-effectiveness?
 - Investments in a new service are reasonable for a given health outcome



Primary Findings

- The health sector stands to benefit from investing in asthma education & home-based environmental interventions
 - Education
 - Services targeted to high risk patients realize **cost-savings**
 - Home-based environmental interventions
 - Assessment, services & supplies targeted to high risk patients are **cost-effective**



Evidence on Costs

- Literature review: 1986-2006

Dozens of research intervention studies



Fewer rigorous studies (RCT or well-designed pre-post)



Fewer including a cost evaluation

- 16 asthma education studies; 2 home-based environmental intervention studies
 - Additional cost evaluations needed
 - Standardized cost evaluation approaches needed



Evidence on Costs: Education

- **Findings: Vast majority of studies demonstrated cost savings.** Across the 20-years of studies: Savings ~\$7 to \$36 for every \$1 invested in asthma education
 - High risk patients → lower health service utilization → cost savings
 - Lower risk patients, not as high health service utilization → less cost savings, but increase in quality of life measures.
- **Studies vary:**
 - Setting: clinic, telephone, hospital or home; individual or group
 - # of visits: 1-8
 - Personnel: nurse, physician, respiratory therapist, medical social worker, health educator
- **Similar educational content:**
 - basic physiology of asthma
 - medications and medication compliance
 - asthma triggers and trigger avoidance
 - self management techniques



Evidence on Costs: Home-Based Environmental Interventions

- **Findings: Program costs not offset by utilization; yet evidence of cost effectiveness. Cost:\$2-\$28 per symptom free-day gained (SFD).**
- Study design:
 - Setting: home
 - # of visits: 5-9
 - Personnel: environmental counselor & community health worker
- Interventions
 - Home assessment
 - Extensive education regarding trigger avoidance
 - Mattress/pillow encasements
 - Pest abatement
 - Vacuum cleaner w/ HEPA filter
 - Smoking cessation



Are Costs for Environmental Interventions Reasonable?

- Findings: \$2-\$28 per symptom free-day gained (SFD)
- Limitations: Based on 2 published cost evaluations
- Comparison with accepted pharmacotherapy:
 - \$7.50 per SFD for inhaled corticosteroid
 - \$11.30 per SFD for budesonide
 - \$523 per SFD for Xolair



Evidence on Costs: Practice Literature

- Combining asthma education & home-based environmental interventions
 - Optima Health: saved \$4.10 for every \$1 spent on their high-risk member program
 - Monroe Plan for Medical Care: realized a 20% reduction in total asthma-related medical costs



Framework for Implementation

TABLE 1:

MODEL INTERVENTIONS

Asthma Education and Environmental Interventions

LOW INTENSITY

SETTING

Individual or Group; Clinic and/or Phone-based (1+ visits)

STAFFING

Nurse, Respiratory Therapist or Health Educator

EDUCATION

Address asthma physiology; medical self-management, written asthma management plan, & control of triggers

SERVICES

Smoking cessation and referrals to other programs/resources

SUPPLIES

Peak flow meters, spacers, environmental supplies as needed

HIGH INTENSITY

SETTING

Individual; Clinic then Home-based (1-5 visits); phone calls to supplement

STAFFING

Nurse, Respiratory Therapist, Medical Social Worker or Health Educator (Medical Education); Community Health Worker or Environmental Counselor (Environmental Interventions); Staffing combinations may be appropriate.

EDUCATION

Same as low intensity

SERVICES

Same as low intensity as well as in-home environmental assessment and remediation services as indicated (e.g. IPM or Mold)

SUPPLIES

Same as low intensity, plus environmental trigger source reduction (e.g., HEPA air filter for smoking, pest control).



Mechanisms for Implementation: Public & Private Payers

- Pay for supplies and services shown to reduce exposures to environmental triggers
- Structure reimbursement mechanisms for the range of providers of asthma education and home-based environmental services
- Establish incentives for providers to classify patients and make referrals to clinical and in-home sessions



Mechanisms for Implementation: Health Provider Groups & Employers

- Provider Groups:
 - Support asthma educators
 - Encourage referrals to home-based asthma management programs
- Employers
 - Request coverage for comprehensive asthma services through health insurance contract negotiations



Mechanisms for Implementation: Policymakers

- Create state-wide reimbursement mechanisms to support best practices in asthma education & environmental interventions



ARC/UML Environmental Investments Initiative

- Research on Payer Decision-making
- Payer Symposium
- Health Department Case Studies
- Health Department Symposium
- Provider Survey
- Provider Consensus Statement
- Provider Conference, with Payer and Policy Maker Participation





BUILDING A FRAMEWORK FOR HEALTHY HOUSING

Investing in Best Practices for Asthma: A Business Case for Education and Environmental Interventions

Michigan Department of Community Health
Healthy Homes Section
Courtney L. Wisinski

Overview of Presentation

- Background
- Methodology
- Limitations
- Evaluation Plan
- Results
- Costs



Background

- \$989,717 HUD funds
- \$319,724 Leveraged funds to date
- November 1, 2005- October 30, 2008
- 300 low-moderate income families with a child diagnosed with asthma residing in Ingham County, MI
- Basic and Custom Intervention



Methodology

- Each family received:
 - Initial Site Visit
 - Baseline Site Visit
 - 1-Month Phone Visit
 - 3 and 6-Month Follow-up Visits



Methodology-Initial Site Visit

- Family Introductions
- Informed Consent
- Participation Agreement
- Visual Assessment
- Schedule Baseline Visit

Family Room		Baseline	3-Month	6-Month				
I10.	Is there carpeting (or a rug) in the TV/family room?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)				
I26.	Are there windows in the TV/family room?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)				
	Can they be opened?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2)				
J08.	Are there outlet covers on exposed outlets?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)				
J12.	Do the rugs have non-slip padding or gripper tape?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)				
J14.	Is there a poison control center number on or near the phone?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)				
J17.	Do the window blinds have wind-ups for the cords?	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)	<input type="checkbox"/> Yes (1) <input type="checkbox"/> No (2) <input type="checkbox"/> NA (66)				
Basic Products	Present (# or NA)	Damaged	# to Install	Location/Date Installed	TA Installed	3-Month FU Y/N	6-Month FU Y/N	Comments
D Batteries								
9V Batteries								
CO Detector								
Entry Door Mat								
Filter Bags								
HEPA Vacuum								
Nightlight								
Outlet Covers								
Pull-Cord Wind Up								
Plug Gripper Tape								
Smoke Alarms								
Custom Products								

Page 1



Methodology-Baseline Site Visit

- Questionnaire:
 - Demographics
 - Family History
 - Asthma Severity
 - Medical Visit Frequency
 - Asthma Medication
 - Asthma Trigger Knowledge
 - Home Cleaning Frequency
 - Injury Knowledge

SECTION C: ASTHMA SEVERITY

****FOR INTERVIEWER**** The next questions ask about how often asthma has affected you or your child. It is important to be as accurate as possible. Asthma symptoms include wheezing, coughing, tightness in chest, shortness of breath, waking up at night because of asthma symptoms, and slowing down of usual activities.

****FOR INTERVIEWER**** The following questions are now referring to the past 30 days.

+	C06.	During the past 30 days, how many days did [CHILD] have wheezing first thing in the morning?	_____ # of Days 99 <input type="checkbox"/> Don't Know
	C07.	During the past 30 nights, how many nights did [CHILD] wake up because of wheezing or tightness in the chest or a cough?	_____ # of Nights 99 <input type="checkbox"/> Don't Know
	C08.	During the past 30 days, how many days did [CHILD] have shortness of breath because of asthma?	_____ # of Days 99 <input type="checkbox"/> Don't Know
	C09.	During the past 30 days, how many days did [CHILD] have wheezing or tightness in the chest or cough?	_____ # of Days 99 <input type="checkbox"/> Don't Know
	C10.	During the past 30 days, how many days did [CHILD] have itchy or watery eyes?	_____ # of Days 99 <input type="checkbox"/> Don't Know
	C11.	During the past 30 days, how many days did [CHILD] have a stuffy, itchy, or runny nose?	_____ # of Days 99 <input type="checkbox"/> Don't Know
	C15.	During the past 30 days, would you say [CHILD] limited	<input type="checkbox"/> Not at all



Methodology-Baseline Site Visit



- Education:
 - Questionnaire
 - Course Manual
 - Hands on training



Methodology- Basic Interventions

- What works:
 - HEPA vacuum
 - Mattress and pillow covers
 - Green cleaning products
 - Fire extinguisher
 - CO detector
 - Fans
 - Caulk



Methodology- Custom Intervention

Before



After



- AC unit
- HEPA room unit
- Beds
- Moisture reduction
Dehumidifiers, roof
repair, gutters



Methodology- Referrals



Help for Children with *Asthma*

Who is eligible for services?

- Children less than 18 years old with asthma
- Low-moderate income households in *Ingham County*, Michigan

What is the cost?

- **FREE**

What help is available?

- We will inspect your home and install the following products to reduce asthma triggers and prevent injuries.
- We will provide any education that you may need to help reduce asthma triggers within your home.

Basic Products for EVERY Family	Custom Products/Services for eligible families
<ul style="list-style-type: none"> • Child safety plugs • HEPA vacuum • Door mats • Fire extinguisher • Mercury-free thermometers • Plastic food containers • Nightlights and flashlights • Green cleaning supplies • Pest gels and baits • New-lead cord window-paint • Low-voltage furnace filters 	<ul style="list-style-type: none"> • Carbon monoxide and smoke detectors • Cabinet safety locks • Skid proof bath mat • Gun trigger locks • Trash can with lid • Smoking cessation kits • Fans • Pillow and mattress covers • Foam crack sealant and caulk • Snap stool • Child safety gate
	<ul style="list-style-type: none"> • Sec. pillows and mattresses • HEPA filter unit • Humidity control • Minor roof repairs • Carpet removal • Floor refinishing • Bathroom vent installation • Garbage removal • Outdoor play equipment improvements • Gutter installation • Plumbing repairs • Pest intrusion prevention • Bath removal/renovating • Window air-conditioning unit • Dehumidifier

Getting started is easy!
If you would like a Healthy Homes University Program application mailed to you, just complete the information requested below and return this sheet by mail or fax or e-mail.

Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Referred by: _____

If you are interested in referring families, please contact:

Courtney Wisinski
Linda Stewart
Michigan Dept of Community Health
Healthy Homes Section
P O Box 30195
Lansing, MI 48909

Phone: 517.335.8252
Phone: 517.335.8867
Fax: 517.335.8800
E-mail: wisinski@michigan.gov
stewartl@michigan.gov

- Medical
- Housing
- School
- Social services
- Community and faith-based organizations



Methodology-Follow-up Site Visits

- Questionnaire
- Additional Education
- Incentive Products



Limitations

- Number of site visits
- Follow-up adherence
- Product procurement
- Product storage/delivery

SITE VISIT PACE												
	J	F	M	A	M	J	J	A	S	O	N	D
INITIAL	█							12	█			
BASELINE		█						12	█			
1-MONTH			█					12	█			
3-MONTH				█			12	█				
6-MONTH					█		16	█				



Evaluation

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Asthma Epidemiologist

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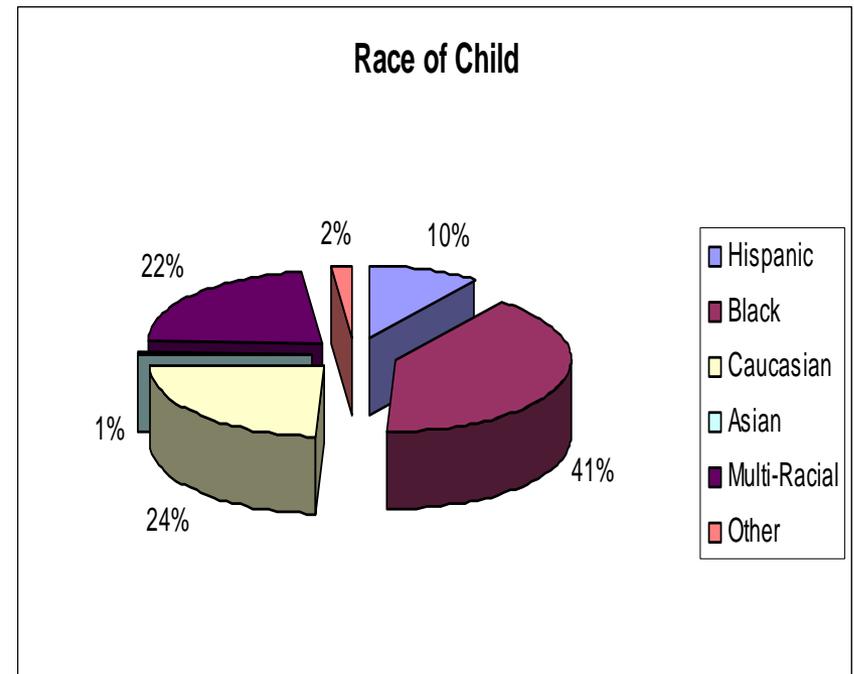
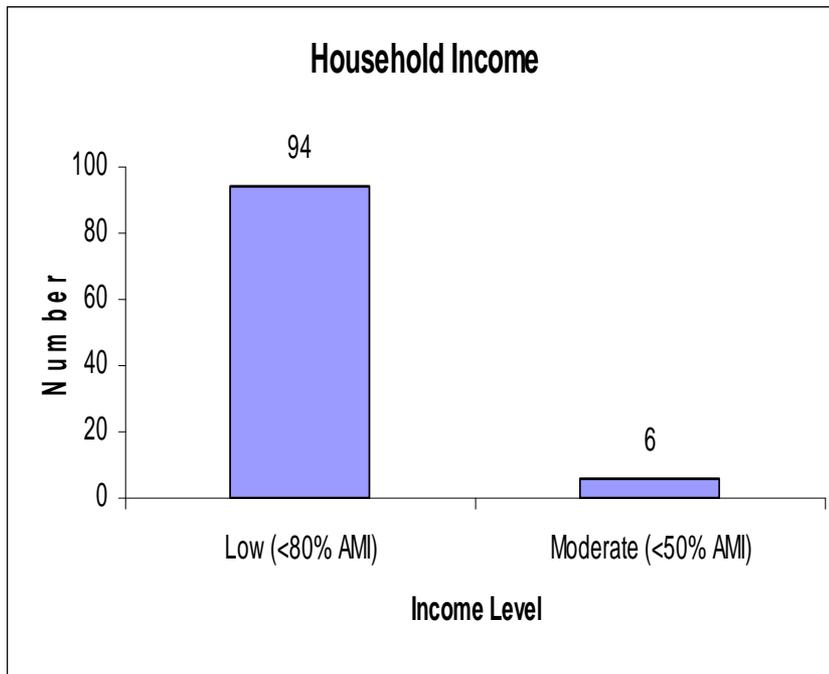
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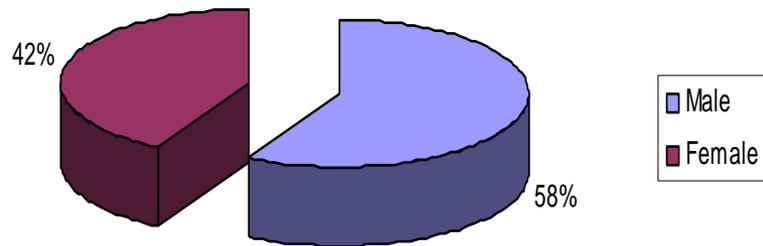


Results-Demographics

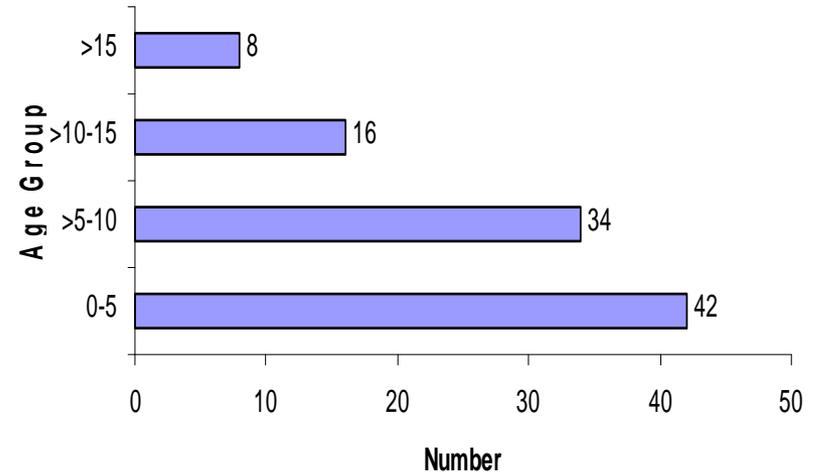


Results-Demographics

Gender of Subject Child

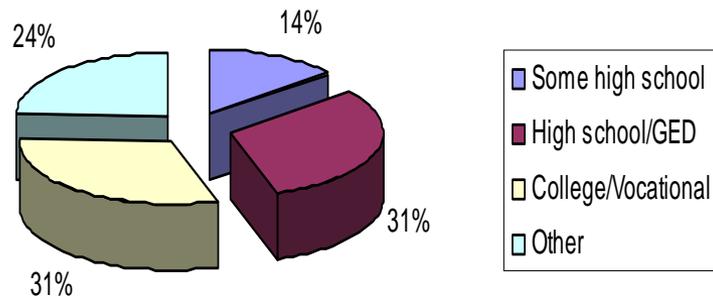


Age Range of Subject Child

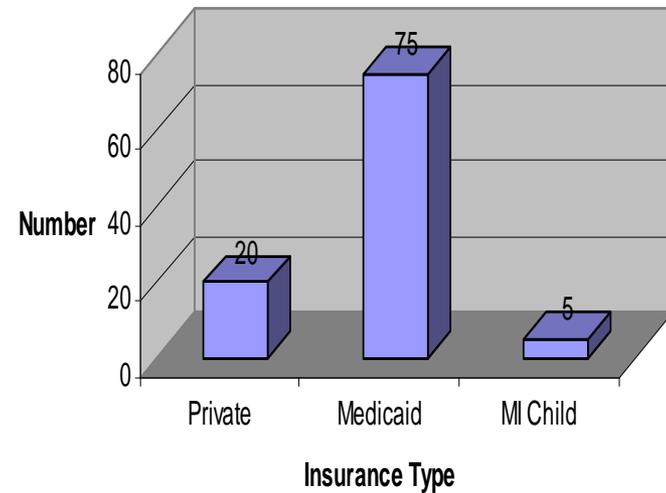


Results-Demographics

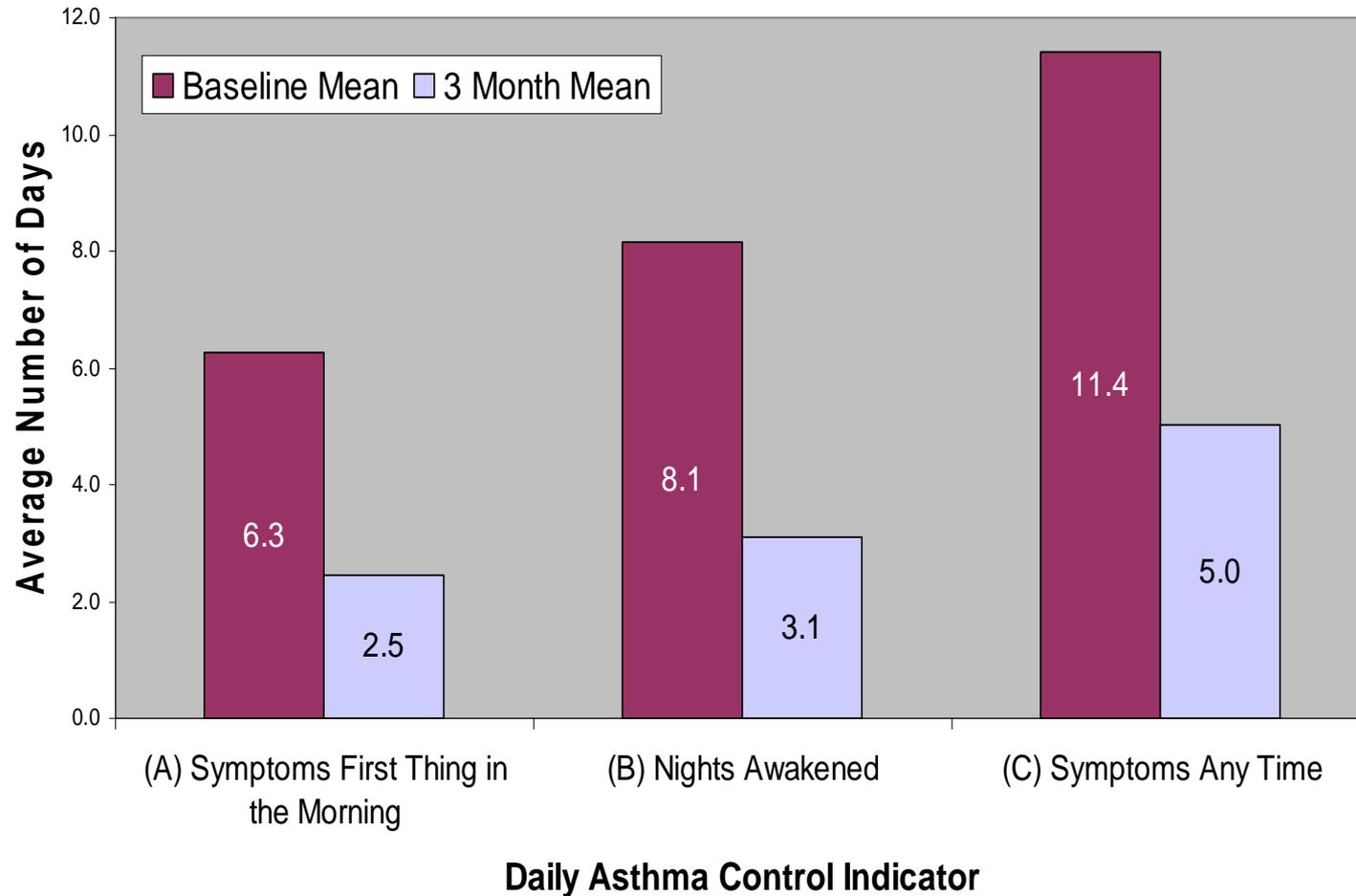
Parent's Education Level



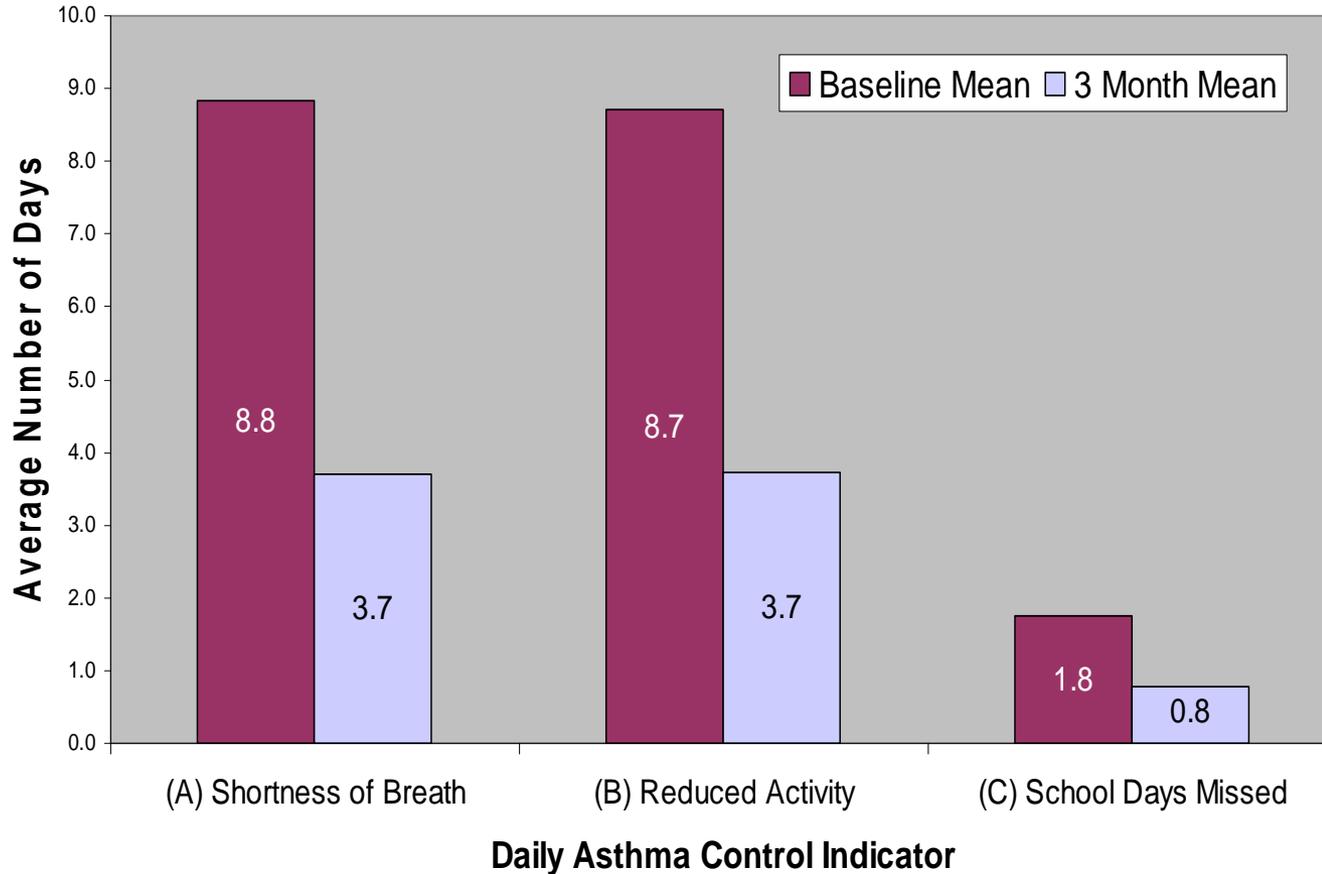
Child's Health Insurance



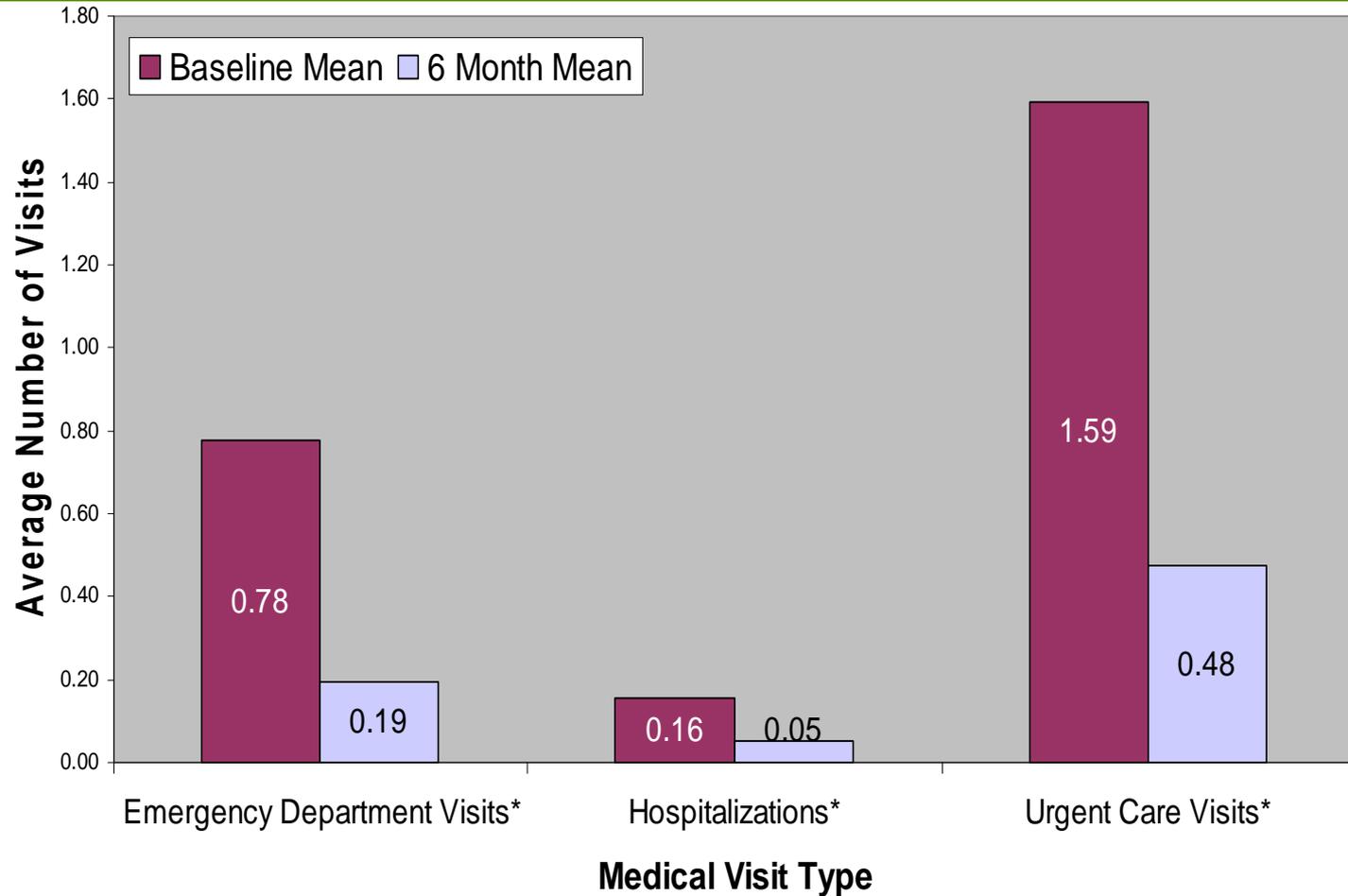
Results- Symptoms/Control



Results- Daily Asthma Control



Results- Medical Visit Frequency



Results- In Progress

- Asthma Trigger Knowledge
- Behavior Change
- Injury Knowledge



Future- Sustainable Funding

- Local Health Plans
 - Physicians Health Plan
- Medicaid
 - 75% of families were Medicaid participants



Cost of Asthma

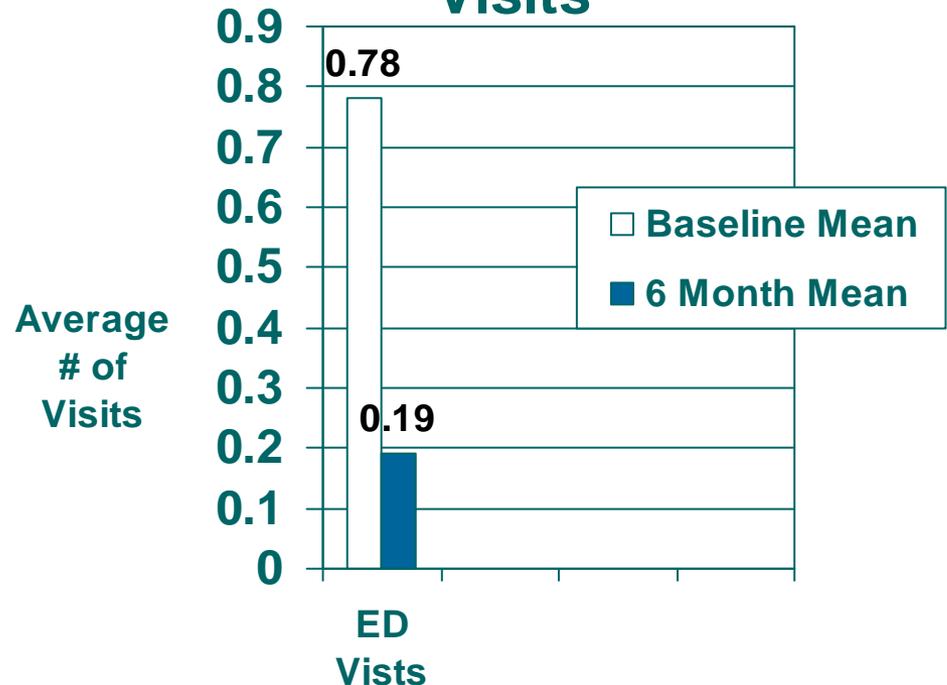
- The total cost of asthma in Michigan is over \$394,000,000 per year;
 - indirect costs over \$170,000,000
 - direct costs over \$224,000,000



Cost Analysis- Emergency Department Visits

- The average cost of an asthma ED visit is \$532*.
- Based on the 0.59 reduction in ED visits per person, resulted in a post-intervention saving of \$314/person on average.

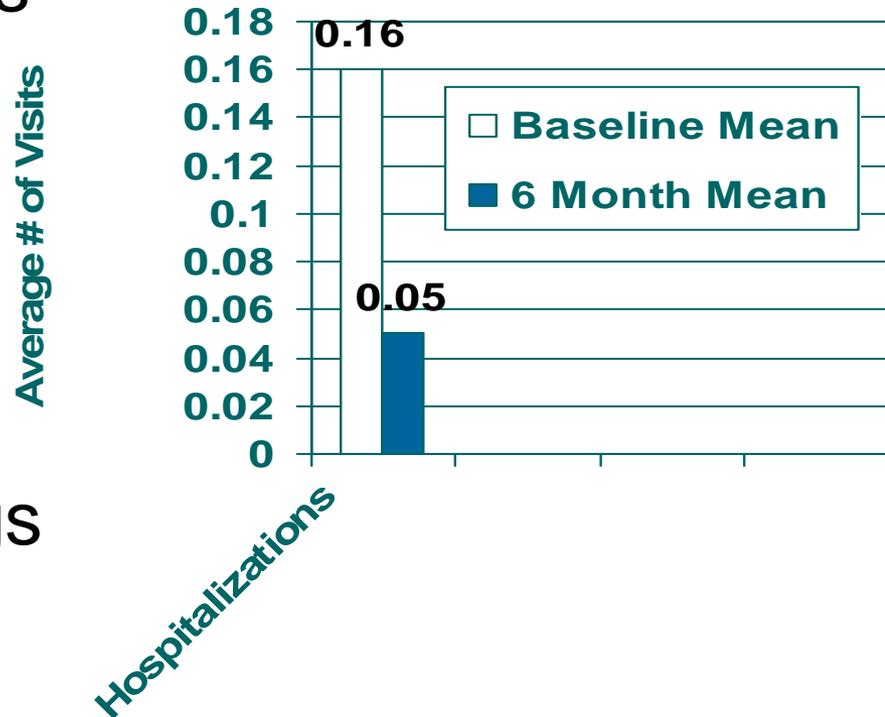
Emergency Department Visits



Cost Analysis- Hospitalizations

- The average cost of an asthma hospitalization is \$10,025.
- Based on the 0.11 reduction in hospitalizations per person, resulted in a post-intervention savings of **\$1,103/person** on average.

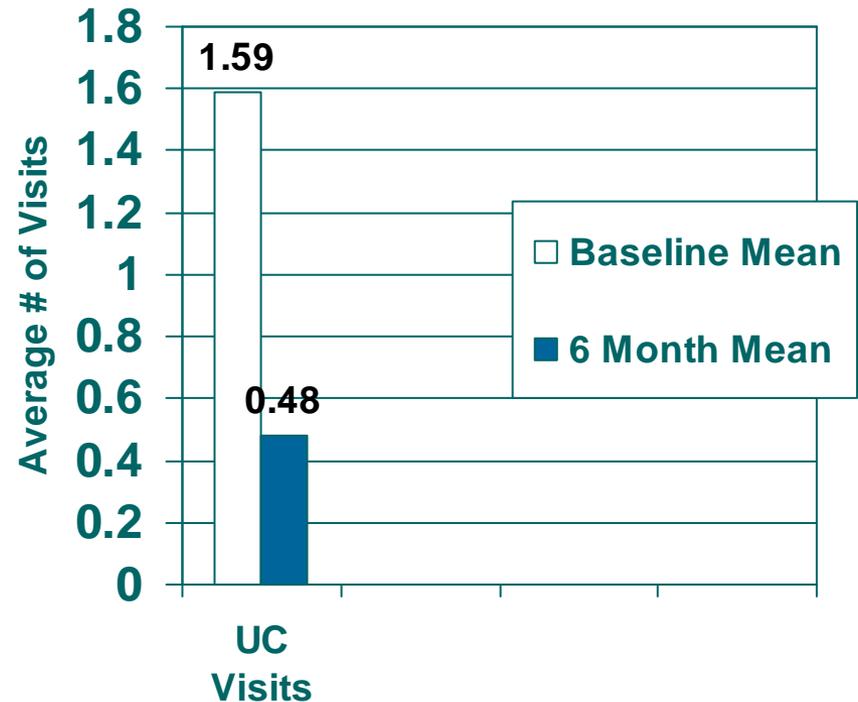
Hospitalizations



Cost Analysis- Urgent Care Visits

- The average cost of an asthma hospitalization is \$84.
- Based on the 1.11 reduction in hospitalizations per person, resulted in a post-intervention savings of \$93/person on average.

Urgent Care Visits



Savings

- The average cost of the an HHU intervention (basic and custom) is \$572.
- Savings = \$1510/person every six months.
- If we used this approach with 1,000 children we would save about \$3 million annually.



Cost Analysis- Other

- Missed school days
- Missed work days
- Unscheduled doctors visits



Questions?



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