Welcome!

North Carolina Forum on Sustainable, In-home Asthma Management

September 13, 2016.
William Friday Center at Chapel Hill. 8:30 A.M.- 4:00 P.M.
Making Stone Soup
Thank you to our Sponsors, Partners and Participants!!

And all of YOU!
Asthma Control

Asthma is a chronic lung disease with recurring symptoms. Symptoms include wheezing, breathlessness, chest tightness, and coughing.

- 1 in 11 children, and 1 in 12 adults have asthma (CDC) [PDF - 531 kB].
- Asthma costs the United States $56 billion each year (CDC) [PDF - 531 kB].
- There's no cure for asthma. People with asthma can manage their disease with medical care and prevent attacks by avoiding triggers (CDC) [PDF - 531 kB].

Task Force Recommendations and Findings

This table lists interventions reviewed by the Community Guide, with a summary of the Task Force finding (definitions of findings). Click on an underlined intervention title for a summary of the review.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Task Force Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home-Based Multi-Trigger, Multicomponent Environmental Interventions</strong></td>
<td></td>
</tr>
<tr>
<td>For Children and Adolescents with Asthma</td>
<td>Recommended June 2008</td>
</tr>
<tr>
<td>For Adults with Asthma</td>
<td>Insufficient Evidence June 2008</td>
</tr>
</tbody>
</table>
Asthma In North Carolina: Data Update

Prepared By: Kathleen Jones-Vessey
North Carolina Department of Health & Human Services Division of Public Health
State Center for Health Statistics

Delivered By: Annie Hirsch, MPH, CPH
Environmental Epidemiologist
Division of Public Health, Occupational and Environmental Epidemiology Branch
North Carolina Department of Health and Human Services
Adult Asthma
Prevalence

Current Asthma
- NC: 7.8%
- US: 8.9%

Lifetime Asthma
- NC: 11.5%
- US: 13.5%

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (BRFSS)
Map L1
Adult Self—Reported Lifetime Asthma
Prevalence Rate (Percent) by State: BRFSS 2014

Footnote: Ranges are based on quintiles of the overall prevalence estimates from year 2011 data.

Air Pollution and Respiratory Health Branch, National Center for Environmental Health
Centers for Disease Control and Prevention

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (BRFSS)
Percentage of North Carolina Adults Who Answered Yes to "Has a doctor, nurse, or other health professional ever told you that you had asthma?"

by North Carolina Association of Local Health Directors (NCALHD) Regions, 2014

Legend

Percent

- 10.0 - 10.3
- 10.4 - 11.2
- 11.3 - 11.7
- 11.8 - 13.4

NCALHD Regions
County Boundary

Source: 2014 Behavioral Risk Factor Surveillance System (BRFSS)
Percentage of North Carolina Adults Who Answered Yes to "Do you still have asthma?"
by North Carolina Association of Local Health Directors (NCALHD) Regions, 2014

Legend
Percent
70 - 71
72 - 77
78 - 8.4
8.5 - 9.5
NCALHD Regions
County Boundary

Region 3
Region 5
Region 7
Region 1 & 2
Region 4
Region 6
Region 8
Region 9 & 10

Source: 2014 Behavioral Risk Factor Surveillance System (BRFSS)
*Adults without asthma are included in the denominator to estimate current asthma prevalence.
NC Adult Current Asthma Prevalence Rates by Gender, 2014

Source: North Carolina State Center for Health Statistics, NC Behavioral Risk Factor Surveillance System (NC BRFSS)
NC Adult Current Asthma Prevalence Rates by Race/Ethnicity, 2014

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>8.1</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>8.7</td>
</tr>
<tr>
<td>Non-Hispanic Am Indian</td>
<td>8.6</td>
</tr>
<tr>
<td>Non-Hispanic Other</td>
<td>9.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, NC Behavioral Risk Factor Surveillance System (NC BRFSS)
NC Adult Current Asthma Prevalence Rates by Age Group, 2014

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-34</td>
<td>7.1</td>
</tr>
<tr>
<td>35-44</td>
<td>7.4</td>
</tr>
<tr>
<td>45-54</td>
<td>7.7</td>
</tr>
<tr>
<td>55-64</td>
<td>9.9</td>
</tr>
<tr>
<td>65-74</td>
<td>8.4</td>
</tr>
<tr>
<td>75+</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, NC Behavioral Risk Factor Surveillance System (NC BRFSS)
### NC Adult Current Asthma Prevalence Rates by Household Income, 2014

<table>
<thead>
<tr>
<th>Household Income</th>
<th>Prevalence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $15,000</td>
<td>13.6</td>
</tr>
<tr>
<td>$15,000-24,999</td>
<td>8.8</td>
</tr>
<tr>
<td>$25,000-34,999</td>
<td>7.3</td>
</tr>
<tr>
<td>$35,000-49,999</td>
<td>6.6</td>
</tr>
<tr>
<td>$50,000-74,999</td>
<td>5.8</td>
</tr>
<tr>
<td>$75,000+</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, NC Behavioral Risk Factor Surveillance System (NC BRFSS)
NC Adult Current Asthma Prevalence
Comorbid Conditions/Risk Factors, 2014

- Uninsured: 7.0%
- Current Smoker: 7.1%
- Diabetes: 13.1%
- Obesity: 10.6%
- CVD: 14.1%
- Disability: 16.3%
- COPD: 31.5%

Source: North Carolina State Center for Health Statistics, NC Behavioral Risk Factor Surveillance System (NC BRFSS)
Asthma Mortality
### NC Resident Deaths with Asthma Listed as a Primary Cause, CY2014

<table>
<thead>
<tr>
<th>Total Asthma Deaths</th>
<th>106</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude (unadjusted) Mortality Rate</td>
<td>10.7</td>
</tr>
<tr>
<td>Age-adjusted Mortality Rate</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, Death Certificate Data
Asthma Hospitalizations
### 2014 NC Resident Inpatient Hospitalizations with A Primary Diagnosis of Asthma

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Hospital Discharges</td>
<td>9,035</td>
</tr>
<tr>
<td>Discharge Rate per 100,000 Population</td>
<td>90.9</td>
</tr>
<tr>
<td>Average Length of Stay (in days)</td>
<td>3.2</td>
</tr>
<tr>
<td>Total Charges</td>
<td>$139,306,354</td>
</tr>
<tr>
<td>Average Charge per Day</td>
<td>$4,872</td>
</tr>
<tr>
<td>Average Charge per Hospitalization</td>
<td>$15,420</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, Inpatient Hospital Discharge Data
2014 NC Resident Inpatient Hospitalizations with A Primary Diagnosis of Asthma by Payer

- Medicaid: 38%
- Medicare Part A: 25%
- Blue Cross & Blue Shield: 10%
- Self Pay: 9%
- All Other: 18%

Source: North Carolina State Center for Health Statistics, Inpatient Hospital Discharge Data
2005-2014 Asthma Hospital Discharge Rates per 100,000 Resident Population

* Primary Diagnosis of Asthma

Source: North Carolina State Center for Health Statistics, Inpatient Hospital Discharge Data
North Carolina
2014 Hospital Discharge Rates with the Primary Diagnosis of Asthma, by County

Rate per 100,000 Population
- 0.0 - 43.2
- 43.3 - 85.8
- 85.9 - 151.2
- 151.3 - 318.3

Source: North Carolina Hospital Discharge Data
Data includes only North Carolina resident data, served in North Carolina hospitals. It is provisional data and is subject to change.

*Rates based on small numbers (fewer than 10 cases) are unstable and should be interpreted with caution.
North Carolina
2014 Hospital Discharge Rates with the
Primary Diagnosis of Asthma for Ages 0 to 14, by County

Rate per 100,000
Population Ages 0 to 14
- 0.0 - 50.6
- 50.7 - 126.3
- 126.4 - 222.1
- 222.2 - 486.2

Source: North Carolina Hospital Discharge Data
Data includes only North Carolina resident data, served in North Carolina hospitals. It is provisional data and is subject to change.

* Rates based on small numbers (fewer than 10 cases) are unstable and should be interpreted with caution.
Emergency Department Visits for Asthma
<table>
<thead>
<tr>
<th>Age Group</th>
<th># ER Visits</th>
<th>Rate per 10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>19,762</td>
<td>103.8</td>
</tr>
<tr>
<td>15-44</td>
<td>22,854</td>
<td>119.8</td>
</tr>
<tr>
<td>45-64</td>
<td>11,642</td>
<td>44.6</td>
</tr>
<tr>
<td>65+</td>
<td>3,958</td>
<td>28.2</td>
</tr>
<tr>
<td>Total</td>
<td>58,216</td>
<td>58.5</td>
</tr>
</tbody>
</table>

Source: North Carolina State Center for Health Statistics, Emergency Department Data
North Carolina
2014 Emergency Department Visits with the Primary Diagnosis of Asthma, by County

Rate per 100,000 Population
- 103.2 - 400.0
- 400.1 - 637.7
- 637.8 - 1015.3
- 1015.4 - 1696.0

Source: North Carolina Hospital Discharge Data
Data includes only North Carolina resident data, served in North Carolina hospitals. It is provisional data and is subject to change.

August 2016
North Carolina
2014 Emergency Department Visits with the Primary Diagnosis of Asthma for Ages 0 to 14, by County

Rate per 100,000 Population Ages 0 to 14
- 214.6 - 804.1
- 804.2 - 13870
- 13871 - 2218.5
- 2218.6 - 3358.2

Source: North Carolina Hospital Discharge Data
Data includes only North Carolina resident data, served in North Carolina hospitals. It is provisional data and is subject to change.

*Rates based on small numbers (fewer than 10 cases) are unstable and should be interpreted with caution.

August 2016
Asthma & NC Children
## Prevalence of Asthma Among NC Resident Children

<table>
<thead>
<tr>
<th></th>
<th>Ever Asthma</th>
<th>Current Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>17.5%</td>
<td>13.6%</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>18.5%</td>
<td>14.2%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>16.4%</td>
<td>13.0%</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>14.4%</td>
<td>9.9%</td>
</tr>
<tr>
<td><strong>African American/Black</strong></td>
<td>28.1%</td>
<td>25.6%</td>
</tr>
<tr>
<td><strong>Other Minorities</strong></td>
<td>11.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td>8.5%</td>
<td>*</td>
</tr>
</tbody>
</table>

*Statistically unreliable estimate.

Source: North Carolina State Center for Health Statistics, Child Health Assessment Monitoring Program (CHAMP)
Most Common Chronic Health Conditions Reported to School Nurses, 2014-15

- Asthma: 93,106
- ADD/ADHD: 57,020
- Severe allergies: 42,163
- Non-Specific Emotional Disorders: 11,375

# School Nurse Asthma Case Management Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>% of Asthmatic Students Demonstrating Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consistently verbalized accurate knowledge of the pathophysiology of their condition</td>
<td>78%</td>
</tr>
<tr>
<td>2. Consistently demonstrated correct use of asthma inhaler and/or spacer</td>
<td>83%</td>
</tr>
<tr>
<td>3. Accurately listed his/her asthma triggers</td>
<td>62%</td>
</tr>
<tr>
<td>4. Remained within peak flow/pulse oximeter plan goals</td>
<td>66%</td>
</tr>
<tr>
<td>5. Improved amount and/or quality of regular physical activity</td>
<td>77%</td>
</tr>
<tr>
<td>6. Improved grades</td>
<td>64%</td>
</tr>
<tr>
<td>7. Decreased number of school absences</td>
<td>70%</td>
</tr>
</tbody>
</table>

Asthma &
Environmental Health
Environmental Public Health Tracking Program: NC Trends Data

http://ephtracking.cdc.gov/showHome.action
Contact Information

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* Raleigh, NC 27603-1392
* Phone: 919-715-9692
* Fax: 919-733-8485
* Kathleen.Jones-Vessey@dhhs.nc.gov
* www.schs.state.nc.us
Icebreaker
Federal Initiatives and Perspectives for Collaboration and Promotion of Home Interventions for Pediatric Asthma
HUD and Partner Activities to Improve Childhood Asthma

North Carolina Forum on Sustainable in-Home Asthma Management

September 13, 2016

Peter J. Ashley, DrPH
HUD Office of Lead Hazard Control and Healthy Homes
Why is a housing agency involved in this health issue?
Potential Impacts of Unhealthy Housing

**Hazards**
- Lead
- Pests
- Dampness
- Mold
- VOCs
- Tobacco smoke
- Radon
- Fall hazards
- Electrical/Fire hazards
- Poisoning hazards

**Health Effects**
- Lead poisoning, which causes
  - Health problems
  - Hyperactivity
  - Reduced IQ
  - Behavioral Problems
  - Learning Disabilities
- Asthma
- Cancer
- Unintentional Injuries
- Other Health Impacts

**Other Impacts**
- Costs to the Individual
  - School absenteeism (asthma is a leading cause)
  - Missed work days for caregiver
  - Diminished quality of life
  - Learning difficulties (lead exposure)
  - Increased medical expenses

- Costs to Society
  - Increased healthcare costs
  - Reduced productivity
  - Lower educational attainment
  - Increased risk of delinquency and criminal behavior (lead poisoning)
U.S. Homes With Moderate or Severe Physical Problems by Household Poverty Status (2013)

American Housing Survey, 2013
Odds Ratios for **Cockroaches** Seen Daily or Weekly by Demographic and Housing Characteristics (2011 American Housing Survey)
Addressing asthma triggers in the home is recommended in national guidelines on asthma management.
Effective asthma care must be comprehensive and include four key components:

- Assess and monitor asthma severity and patient ability to manage and control
- Educate to improve self-management skills of the patient and their family
- Reduce environmental exposures that worsen asthma
- Use appropriate medications
NAEPP Guidelines: Recommendations on in-Home Control of Asthma Triggers

○ Evaluate the potential role of allergens and irritants
  – Identify allergen and pollutants/irritant exposures
  – Persistent asthma: use skin or in vitro testing to assess sensitivity to perennial indoor allergens

○ Advise patients to reduce exposure to allergens and pollutants/irritants
  – Multifaceted allergen control educational programs provided in the home setting can help patients reduce exposure to cockroach, dust-mite, and rodent allergens and, consequently, improve asthma control.
Multiple federal agencies have identified reduction of racial and ethnic asthma disparities as a national priority.
Asthma Disparities Action Plan Received a High Level Launch (May 31, 2012)
Organization:

• Inter-agency task force co-chaired by officials from the EPA (Dr. Ruth Etzel, Office of Children’s Health Protection) and the DHHS (Sandra Howard, Office of the Asst. Secretary for Health)

TF Mission:

• Identify priority issues of environmental health and safety risks to children that can best be addressed through interagency efforts
• Recommend and implement interagency actions
• Communicate to federal, state, and local decision makers information to protect children from risks

Priority Areas:

• **Asthma Disparities**
• Settings where children live, learn, and play (e.g., healthy homes)
• Potential impacts of climate change on children’s health
The focus of the plan is on: “preventable factors that contribute to disparities in the burden of asthma”, including:

• Barriers to the implementation of guidelines-based asthma care:
  – Medical care factors
  – Physical and psychosocial environmental factors

• Lack of local capacity to deliver community-based, integrated, comprehensive asthma care

• Gaps in capacity to identify and reach children most at risk
Strategy 1: Reduce barriers to the implementation of guidelines-based asthma management

Priority Actions:

1.1 Explore strategies to expand access to asthma care services
   • including: patient education, home interventions, medications, subspecialty services when needed

1.2 In health care settings, coordinate existing federal programs in underserved communities to improve the quality of asthma care

1.3 In homes, reduce environmental exposures

1.4 In schools and child care settings, implement asthma care services and reduce environmental exposures
Strategy 2: Enhance local capacity to deliver integrated, comprehensive care

Priority Actions:

2.1 Promote cross-sector partnerships among federally supported, community-based programs targeting children with a high burden of asthma.

- (e.g., tobacco control, obesity prevention, radon, healthy homes, weatherization, lead hazard control)

2.3 Conduct research to evaluate models of partnerships that empower communities to identify and target disparate populations and provide comprehensive, integrated care at the community level.
Sponsoring asthma summits

– 8 summits held starting with Cleveland in Oct, 2012 in coordination with federal partners (EPA, CDC/HHS) and have collaborated on several others

Promoting smoke-free multifamily housing

– Starting in 2009 HUD program offices issues notices encouraging adoption of SF housing policies (covering public housing and assisted multifamily housing)
– Published additional guidance on adopting SF policies
– Nov, 2015: published proposed rule to prohibit smoking in public housing

Sponsoring integrated pest management training
StopPests is Funded by HUD via USDA to provide consultation and training to affordable housing providers to manage pests using integrated pest management (IPM). Contact StopPests for:

- In-house staff training “IPM in Multifamily Housing”
- Individual consultation and recommendations for challenging situations
- Training opportunities including recorded and live webinars and videos
- Up-to-date pest control information on StopPests.org and a blog and social media sites
In Summary: Reasons to Expand in-Home Asthma Interventions

- Recommended in national asthma management guidelines
- Exposure to residential triggers is an important contributor to asthma disparities
- Reducing asthma disparities is a national priority
- In-home interventions can improve asthma control and quality of life while reducing healthcare costs
Thank You!

The *Action Plan* is available at: [https://www.epa.gov/asthma/coordinated-federal-action-plan-reduce-racial-and-ethnic-asthma-disparities](https://www.epa.gov/asthma/coordinated-federal-action-plan-reduce-racial-and-ethnic-asthma-disparities)


peter.j.ashley@hud.gov
The CDC 6/18 Initiative:

Promoting Public Health-Health Care Collaboration and
Reimbursement of Preventive Asthma Control Strategies

National Asthma Control Program
Air Pollution and Respiratory Health Branch
September 2016
CDC Strategic Directions

Improve health security at home and around the world

Better prevent the leading causes of illness, injury, disability, and death

Strengthen public health/health care collaboration
3 Buckets of Prevention

1. Traditional Clinical Prevention
   - Increase the use of evidence-based services

2. Innovative Clinical Prevention
   - Provide services outside the clinical setting

3. Total Population or Community-Wide Prevention
   - Implement interventions that reach whole populations

Asthma’s Impact on the Nation

- Over 22 million affected
- Costs ~$63 billion annually
- Higher prevalence: Black Americans (9.9%), Hispanics of Puerto Rican descent (14.6%), <100% of federal poverty level (10.9%)
- Asthma burden
  - 1.8 million emergency department (ED) visits
  - 439,000 hospitalizations
  - About 9 people die from asthma each day
- Burden can be reduced by controlling asthma

Sources: www.cdc.gov/asthma/most_recent_data.htm; Jang J et al., Ann Allergy Asthma Immunol, 2013; www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf
Background

Comprehensive asthma control strategies can:

- Reduce emergency department visits by as much as 68%
- Reduce hospitalizations by as much as 85%
- Show a short-term positive return on investment

Collaboration Within CDC

THE 6|18 INITIATIVE

DIVISION OF ENVIRONMENTAL HAZARDS AND HEALTH EFFECTS

Control Asthma

SIX WAYS TO SPEND SMARTER FOR HEALTHIER PEOPLE
Promoting Collaboration Between Public Health and Health Care

CDC

- Identify evidence-based prevention interventions associated with high-burden conditions

Purchasers, Payers, and Providers

- Finance and deliver care
Collaboration Within CDC to Engage Payers: Asthma Control Strategies

Promote evidence-based medical management following 2007 NAEPP guidelines

Promote strategies that improve access and adherence to asthma medications and devices

Expand access to intensive self-management education

Expand access to home visits by licensed professionals or qualified lay health workers

NAEPP, National Asthma Education and Prevention Program
Collaboration Within CDC to Engage Payers: Asthma Control Strategies

Key Accomplishments

• Established and published evidence base for this approach

• National Governors Association Paper “Health Investments That Pay Off: Strategies for Addressing Asthma in Children”

• CDC’s National Asthma Control Program White Paper “Developing a Business Case for Asthma Services in Your State”

Lessons Learned

• Both cost and quality can be valuable to health plans

• Building on existing partnerships and infrastructure can facilitate progress

• Using health plan analytics can be helpful to identify those at high risk

• Targeting individuals at higher risk can yield a higher ROI
Visit the 6|18 Website
Next Steps

- **Continue collaboration within CDC to engage payers**

- **Continue collaboration with external partners**
  - President’s Task Force on Environmental Health Risks and Safety Risks to Children
    [www.epa.gov/childrenstaskforce](http://www.epa.gov/childrenstaskforce)
  - National Center for Healthy Housing
    [www.nchh.org/program/equippingstatesforreimbursement.aspx](http://www.nchh.org/program/equippingstatesforreimbursement.aspx)
  - State asthma programs
    [www.cdc.gov/asthma/contacts/default.htm](http://www.cdc.gov/asthma/contacts/default.htm)
Next Steps

- Create, disseminate, and regularly update resources for states and other partners
- Identify and disseminate other relevant documents and trainings regarding asthma-related reimbursement
Acknowledgments

CDC National Asthma Control Program
   Elizabeth Herman
   Joy Hsu
   Tursynbek Nurmagambetov
   Lillianne Lewis
   Natalie Wilhelm

CDC Office of the Associate Director for Policy
   Laura Seeff
   Jocelyn Wheaton
   Kristin Brusuelas
   Nick Di Meo
   Christa Singleton

For more information please contact:
   National Asthma Control Program
   4770 Buford Highway, MS F-60
   Chamblee, GA 30341
   Telephone: 770-488-3700
   Visit: www.cdc.gov/asthma

The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Heidi LeSane
U.S. Environmental Protection Agency
Region 4
**Foundation:** Effective asthma care must be comprehensive & address the environment & self management skills

**Focus:** Environment, in-home asthma care, local capacity
Equip health, housing, environmental and health insurance programs to effectively support the delivery, infrastructure and/or sustainable financing of environmental asthma interventions at home and school.
Our Approach:

**Equip 300 health, housing, environmental and health insurance programs to effectively support the delivery, infrastructure and/or sustainable financing of environmental asthma interventions at home and school.**

Influence Health Plans, State Medicaid & Key Stakeholders

Equip Programs to Act
Key Interests Represented

- **People paying for services**
  - State Medicaid/Legislature
  - Health Plans

- **People delivering services**

- **People supporting and driving change**
  - Regional health, housing and environment
Key Considerations for Securing Sustainable Financing

• Delivery Provider
  – Community Health Worker
  – Nurse, RT, other licensed practitioner

• Program Components
  – Education
  – Environmental assessment
  – Intervention/Remediation

• Community Support System & Infrastructure
  – Link with clinical care
  – Connection to housing & environment programs

❖ Population served
❖ Program Outcomes & Return on Investment
Resources are bucketed for ease of use and to highlight key topic areas.
Bringing multiple streams of funding together to cover the full spectrum of in-home asthma care is often referred to as "braided funding."

The illustration here represents ways that funding for home-based asthma care services can be combined to cover critical in-home asthma care needs.
• Promote coverage of in-home asthma care services by Medicaid programs and private insurers (summits held in: Cleveland, Kansas City, Baltimore, Denver, Philadelphia and Los Angeles).

• HUD lead with assistance from EPA, CDC, and HHS Asst. Sec for Health.

• EPA is active collaborator and participant (highlights work from “local champions” and organizations that have made progress on the issue).

• Materials from summits are posted on EPA’s Asthma Community Network website: www.asthmacommunitynetwork.org/resources/conferences/
Federal Initiatives and Perspectives

Discussion
North Carolina
State of the State

Neasha Graves, Moderator
Reducing Asthma among Rural and Underserved Populations in Eastern NC

Greg Kearney, DrPH, MPH, REHS
Assistant Professor
East Carolina University,
Department of Public Health, Brody School of Medicine

Theresa Blount, RN, BSN, AE-C
Asthma Coordinator, Pediatric Asthma Program
Vidant Medical Center

North Carolina Forum on Sustainable In-Home Asthma Management
North Carolina – State of the State and Open Discussion

William Friday Center - UNC
September 13, 2016
Take a few seconds to reflect on “The River” story

References:
TIME Wednesday, Jan 06, 2010
Our Story
• The Eastern Carolina Asthma Prevention Program (ECAPP) developed as a community based, collaborative research project in 2012 between an environmental public health professor at East Carolina University and Peds Asthma Program at Vidant Medical Center in Greenville, N.C.

Our Goal
• Reduce asthma and asthma symptoms among rural, low income families that have children with moderate to severe asthma (age 5-17 years) in Eastern North Carolina.

What We Do
• Focus on children (5-17 years) with moderate to severe asthma.
• Our emphasis is on education and prevention with a research component.
• We use targeted, multi-component intervention strategies – Kings County, Seattle WA model.
• Follow NHLBI guidelines to reduce environmental exposures
• Provide guidance and resources to help families that have children with asthma.
• Work to improve respiratory health, reduce emergency department visits of children with asthma in Eastern N.C.
• Conducted over 50 individual home-based visits - Reference:
Our Target Area

• The 29-County region in eastern North Carolina; Our primary emphasis has been on African-Americans in rural and underserved areas.

Funding Sources:

• East Carolina University (Community Partnership) - $8,000 – Develop Program (ECAPP)
• Vidant Medical Center, Edgecombe - $9,500 – Asthma Interventions
• Vidant Medical Center - Pitt - $5,000 – Asthma Interventions
• Brody School of Medicine - $43,500 - Indoor Air Testing, Personal Monitors, Biomarkers (N=25)

Recent Additions to ECAPP

• Development of the Eastern Carolina Asthma Consortium (ECAC)
• Sampling Indoor Environments
Poverty’s Enduring Tradition in Rural North Carolina: How Do We Respond?

Billy Ray Hall

Fewer than 49% of rural NC are homeowners

Hall BR, Popular Government Spring/Summer, 2003
http://sogpubs.unc.edu/electronicversions/pg/pgpsm03/article3.pdf
North Carolina
2014 Emergency Department Visits with the Primary Diagnosis of Asthma, by County

Rate per 100,000 Population
- 103.2 - 400.0
- 400.1 - 637.7
- 637.8 - 1015.3
- 1015.4 - 1696.0

Source: North Carolina Hospital Discharge Data
Data includes only North Carolina resident data, served in North Carolina hospitals. It is provisional data and is subject to change.

August 2016
North Carolina
2014 Emergency Department Visits with the Primary Diagnosis of Asthma for Ages 0 to 14, by County

Rate per 100,000 Population Ages 0 to 14
- 214.6 - 804.1
- 804.2 - 1387.0
- 1387.1 - 2218.5
- 2218.6 - 3358.2

Source: North Carolina Hospital Discharge Data. Data includes only North Carolina resident data served in North Carolina hospitals. It is provisional data and is subject to change.

*Rates based on small numbers (fewer than 10 cases) are unstable and should be interpreted with caution.
“Environmental” Products to reduce Indoor Allergens

Products:

• Commercial grade Vacuum with HEPA filter
• Non-allergen mattress /pillow encasings (fit to child’s bed)
• Toxic “free” cleaning products
• Non-odor, non-toxic, pesticides and rodent baits*
• Food storage containers

*In some cases commercial pesticide/cleaning services were used
Intervention: Personalized Instructions, Education and Demonstrations on Using Products
• **Reduced cost savings** –

• Our cost $440-$500 per family for 2 scheduled home visits (included all products);*

• Avg ED visit costs = $691 and In-patient stay = $7,987**

• Other benefits: Fewer visits to ED, Physician office visits; fewer missed school and work days and less financial and emotional burden on child and family

* Does not include vacuum cleaner; For vacuum cleaner, add ~$170 (includes HEPA filter bags)

### Eastern Carolina Asthma Prevention Program (ECAPP)
#### Average Products and Service Costs (1 family/child enrolled for 6 months) for 2 home visits (12/2015)

<table>
<thead>
<tr>
<th>Product/Service</th>
<th>Count</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel (home visit)</td>
<td>20 miles X 2 Trips X $0.59/mile</td>
<td>$23.60</td>
</tr>
<tr>
<td>Staff Time - 1 nurse &amp; 1 Env. Health Specialist</td>
<td>2 staff @ 3 hrs. (includes benefits)</td>
<td>$300.00</td>
</tr>
<tr>
<td>Dust Mite Mattress encasing (full size)</td>
<td>1</td>
<td>$31.97</td>
</tr>
<tr>
<td>Dust Mite Pillow encasing</td>
<td>1</td>
<td>$4.95</td>
</tr>
<tr>
<td><strong>Toxic-Free Cleaning Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor cleaner</td>
<td>1</td>
<td>$3.00</td>
</tr>
<tr>
<td>Mice baits</td>
<td>8 (box)</td>
<td>$7.99</td>
</tr>
<tr>
<td>sponges</td>
<td>8 (box)</td>
<td>$1.19</td>
</tr>
<tr>
<td>microfiber mop</td>
<td>1</td>
<td>$7.50</td>
</tr>
<tr>
<td>Roach baits</td>
<td>5 (box)</td>
<td>$4.50</td>
</tr>
<tr>
<td>Lysol</td>
<td>2 (cans)</td>
<td>$2.25</td>
</tr>
<tr>
<td>Dust cloths</td>
<td>3 (pouch)</td>
<td>$3.00</td>
</tr>
<tr>
<td>Furniture polish</td>
<td>1 (can)</td>
<td>$3.50</td>
</tr>
<tr>
<td>Counter-top Disinfectant</td>
<td>1 (can)</td>
<td>$1.50</td>
</tr>
<tr>
<td><strong>In-home Tests</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaled Nitric Oxide Test (eNO) for inflammation</td>
<td>2 (times)</td>
<td>$19.00</td>
</tr>
<tr>
<td>Spirometry Test</td>
<td>2</td>
<td>N/C</td>
</tr>
<tr>
<td>Mouth Pieces for eNO</td>
<td>2</td>
<td>$1.60</td>
</tr>
<tr>
<td>Mouth Pieces for spirometry</td>
<td>2</td>
<td>$1.80</td>
</tr>
<tr>
<td>Nose clips</td>
<td>2</td>
<td>$0.60</td>
</tr>
<tr>
<td>Asthma Educational Material Printing Costs</td>
<td>1 packet</td>
<td>$7.50</td>
</tr>
<tr>
<td>Gift Card (incentive)</td>
<td>1 store card</td>
<td>$20.00</td>
</tr>
</tbody>
</table>

**Total Costs** $443.65
Innovative ideas
Private funding supports research to address disease in eastern North Carolina.

By Catryn Kennedy

An exciting, private fundraising effort at East Carolina University’s Brody School of Medicine is paying dividends for the university by allowing researchers to explore new areas in their fields and attract significant federal and industry grants.

Established in 2006, the Brody Brothers Endowment is a 501(c)(3) organization that seeks to attract private funding to support medical research. The endowment has provided more than $5 million over the past ten years to support high-priority projects in areas that have the potential to have an impact on health and society.

The Brody Brothers Endowment Committee approves approximately $800,000 for the 2016 fiscal year, with the remaining funds to be divided among 11 grant proposals. Projects to earn funding this cycle included research related to cancer, diabetes, cardiovascular disease and obesity.

The awards range from $20,000 to $40,000, but in an increasingly competitive funding environment, "no-cap grants" have become essential in attracting larger awards from agencies such as the National Institutes of Health (NIH) and the National Science Foundation.

"Many of the major federal mechanisms that provide in-state grants and compete with the NIH," said Dr. Bob Lust, chair of physiology at Brody and a member of the proposal review team, "require more research to be competitive as possible on the first attempt.

Last year the Brody Brothers Endowment Committee received proposals from researchers from the medical school, "who are the first to say they are hungry for funding,’" said Lust. "This year, though, we have more proposals from researchers who are looking for funding to support their work and improve their research.

The endowment’s primary goal is to support the research of Brody faculty.

The Brody Brothers Research Endowment is a 501(c)(3) organization that seeks to attract private funding to support medical research.


"This Brody grant enabled us to back up and look at biomarkers and determine what’s contributing to their disease," said Kennedy. "We want to see a shift in how we can use this information to develop new treatments and therapies that could help people with chronic diseases.

"It’s great to see this work being done and to see how it can impact people’s lives. We want to continue to attract the best talent and support them in their work. That’s what it’s all about. It’s about making a difference in people’s lives, and that’s what this grant is all about.”
Strengths & Challenges

What worked
• Reduced ED visits and unscheduled doc visits; increase in med compliance
• Case workers - reflective of population (caring and supportive)
• Continuous 2 week follow up calls

Challenges
• Some behavioral changes, difficult or impractical (housekeeping; washing hot water; smoking in home)
• Rental Housing and Landlords issues – Majority are renters
• Sustainability
• Access to resources - pest control, carpet cleaning and mold removal
• Working with physicians that needed to be educated about FeNo testing and new technology
An Upstream Approach to a Downstream Problem

• Strategies for improving indoor environmental quality must go beyond asking household members to take environmental actions (Kreiger et al., 2005)
• Connect family with available community resources
• Make Affordable Housing, Affordable.
• Fund programs that go beyond looking under the “urban lamp post”
• Physicians Medical Training -emphasis on social determinants of health (work, play, home)
• Policies for Reimbursement on Products, Home-Based Visits; include Health Departments (EH and a community nurses)
• Develop Policies to Giving EH in CHD authority to conduct IAQ investigations
References


• Kennedy, K. Business NC, July 2016. Research Innovative Ideas: Private Funding Supports Research to Address Disease in Eastern N.C.

• NC Department of Public Health and Human Service. 2016. Asthma in North Carolina.


Regional Asthma Disease Management Program

Population Based Health Care

Melinda Shuler, BSBA, RCP, HHS, AE-C
Regional Clinical Supervisor/Principal Investigator
Asheville, NC
• Location: Asheville, North Carolina

• Type of Program: Non-profit Community Health System

• Service Area: 21 counties in Western North Carolina, including the Eastern Band of the Cherokee Indians

• Population Served: Remote, rural; Urban; Latino and Slavic communities
Building the System

Conduct Needs Based Planning:

2001 - Buncombe County Health Center Community Health Assessment

Develop RADMP to deliver asthma education and interventions.

Incorporate messages from GIP Report and EPR-3 Guidelines.

Conduct 1-3 hour environmental assessments at child care, elementary school and home sites.
Building the System

Focus on Resource Strategy at Every Step

• **Utilize Community Partnerships:**
  - Faith-based organizations
  - WNC School systems
  - WNC Child care centers
  - Charitable community partners

• **State Partnerships:**
  - NC Division of Public Health
  - NC Asthma Program
  - Asthma Alliance of NC

• **National Partnerships:**
  - National Heart, Lung, and Blood Institute
  - Asthma Allergy Foundation of America
  - National Environmental Health Association
  - National Center for Healthy Housing
Our Typical Patient

- Uninsured or underinsured
- Poor socioeconomic status
- Average patient age 8
- Variety of ethnic groups
- Single parent home
Patient Referral

- Primary Care Provider
- Hospitalist
- ED Physicians
- Specialist
- School Nurses
- School Social Worker
- Satellite clinics
Clinical Assessment

• Lung Spirometry with pre/post bronchodilator
• FeNO (a measurement of inflammation by assessment of nitric oxide concentrations)
• Exercise Challenge
• Peak Flow Meter Monitoring
• Symptom Diary Usage
• Quality of Life questionnaire
• Vital signs
Patient Education

- Pathophysiology of asthma
- Identification of triggers and avoidance measures
- Identification of early and/or late warning signs
- Appropriate use of device(s)
- Empowering the patient self-manage
Environmental Assessment

Conduct 1-3 hour environmental assessments at child care, elementary school and home sites.
Social Determinants of Health

- Environmental
- Financial
- Social
- Community Resources
Health Promotion

- World Asthma Day
- Fit Together
- Environmental Assessments
- Health Fairs
- Asthma In-services
Evaluating the System

Collect health data

- Level of Severity
- Level of Control
- Environmental trigger exposure
- ED visits
- Hospitalizations
- Lung spirometry and exhaled nitric oxide
- Quality of Life Questionnaires
- Missed school days
- ACT score
National Asthma Control Initiative (NACI)

- Funded by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institute of Health.
### Demographics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>n=50</td>
</tr>
<tr>
<td><strong>Average Age</strong></td>
<td>8 years</td>
</tr>
<tr>
<td><strong>Age Range</strong></td>
<td>3-12 years</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>56%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>44%</td>
</tr>
<tr>
<td><strong>Caucasian</strong></td>
<td>38%</td>
</tr>
<tr>
<td><strong>American Indian</strong></td>
<td>28%</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td>6%</td>
</tr>
<tr>
<td><strong>Mexican American</strong></td>
<td>4%</td>
</tr>
<tr>
<td><strong>African American</strong></td>
<td>24%</td>
</tr>
</tbody>
</table>
## NACI ASTHMA GRANT DIAGNOSTICS AND COST ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>12 Months Prior to Intervention</th>
<th>24 Months Post Intervention</th>
<th>24 Months Cost Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ED Utilization</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Visits</strong></td>
<td>158</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td><strong>IMPACT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>$150,583</td>
<td>$8,577</td>
<td>$142,006</td>
</tr>
<tr>
<td><strong>HOSPITALIZATION/ED</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospitalizations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Hospitalizations</strong></td>
<td>60</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total Charges</strong></td>
<td>$723,660</td>
<td>$36,183</td>
<td>$687,477</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>$745,067.92</td>
</tr>
<tr>
<td><strong>QUALITY OF LIFE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School Absences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Average missed days</strong></td>
<td>17</td>
<td>9</td>
<td>10**</td>
</tr>
<tr>
<td><strong>MEASUREMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLINICAL OUTCOMES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FVC</strong></td>
<td>95.2</td>
<td>102.5</td>
<td>7.2**</td>
</tr>
<tr>
<td><strong>FEV1</strong></td>
<td>85.6</td>
<td>98.7</td>
<td>13.1**</td>
</tr>
<tr>
<td><strong>FEF25-75</strong></td>
<td>67.5</td>
<td>88.4</td>
<td>21.1**</td>
</tr>
<tr>
<td><strong>FeNO</strong></td>
<td>23.9</td>
<td>21.1</td>
<td>3.4**</td>
</tr>
</tbody>
</table>

Source: Decision Support 2011 Data: $953.06/ED Visit  
Source: NC State Center for Health Statistics, 2009 Provisional Hospital Discharge Data: $12,061

*** Inclusive of all subjects--SABA, Oral Steroids, Air-trapping
Statistically Significant denoted as * p<0.05 and ** p<0.01 by parametric (paired t-test) and by non-parametric (Wilcoxon Signed Rank) tests

SAS/STAT®. SAS Institute Inc., SAS Campus Drive, Cary, NC 27513
## NACI Social Determinants of Health -- Asthmatic Children

<table>
<thead>
<tr>
<th>Approximate Value</th>
<th>Social Determinants of Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3,800</td>
<td>Bedding encasement ($76 per person)</td>
</tr>
</tbody>
</table>
| $1,940            | Dodson Pest Control ($125 per visit)  
                  | Waste Pro Large dumpster |
| $2,500            | HVAC System (1 family) |
| $3,000            | Flooring, windows, doors,... |
| $960              | Plumber (12 hours at $80 per hour) |
| $4,920            | Bathroom replacement (4 homes) |
| $1,350            | Roof repair/replacement/sealant |
| $5,800            | Furniture-beds, sofa, chairs, end tables, lamps, TVs |
| $180              | Pillows, sheets |
| $12,384           | Food referrals--Hearts with Hands, Manna, Upward Ministries,  
                  | $1.72 x 20 pound box = $34.40 (Feeding America National Average) (30 families-12 boxes per family) |
| $8,400            | Heating Assistance, $600 per family |
| $5,100            | Emergency Assistance, $300 per family |
| $1,200            | Christmas - toys, clothes, and presents (4 families) |
| $180              | Car Seats ($60 each) |
| $2,000            | Clothing Referrals ($100 each) |
| $240              | Dehumidifier (2) |
|                   | Donations:  
|                   | $200 Target  
|                   | $575 Wal Mart  
|                   | $200 Sam's Club  
| $1,024            | Cracker Barrel - 16 family pack dinners at $64 each  
| $900              | Chic-Fil-A - 300 gift cards for Kid's meal  
| $600              | Belks - clothing for two 4-person families  
| $400              | Dillards - shoes for two 4-person families  
| $7,792            | Volunteer hours--assistance with home remediation, cleaning, etc.; 20 volunteers X 20 hours each = 400 hours X $19.48 per hour  
| $300              | Back to school assistance |
## Social Determinants of Health

<table>
<thead>
<tr>
<th>Approximate Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3,800</td>
<td>Bedding encasement ($76 per person) x 50</td>
</tr>
<tr>
<td>$1,500</td>
<td>Dodson Pest Control (12 visits at $125 per visit)</td>
</tr>
<tr>
<td>$440</td>
<td>Waste Pro - large dumpster delivery and pickup</td>
</tr>
<tr>
<td>$1,640</td>
<td>Bathroom replacement 1.5 bathrooms (shower, 2 toilets, 2 sink/vanity, faucets) and 8 hours plumber at $80 per hour</td>
</tr>
<tr>
<td>$340</td>
<td>Bathroom floor replacement (plywood, vinyl) and 3 hours labor at $80</td>
</tr>
<tr>
<td>$960</td>
<td>Plumber for sewage problems, 12 hours at $80</td>
</tr>
<tr>
<td>$400</td>
<td>Futon--Sam's Club</td>
</tr>
<tr>
<td>$1,600</td>
<td>Furniture--sofa, chairs, 2 end tables, 2 lamps, 2 TVs)</td>
</tr>
<tr>
<td>$30</td>
<td>Pillows, sheets</td>
</tr>
<tr>
<td>$800</td>
<td>Kitchen--china hutch, table, microwave, stove, refrigerator</td>
</tr>
<tr>
<td>$1,100</td>
<td>Ashley Furniture--full bed and headboard; 2 twin beds with headboards</td>
</tr>
<tr>
<td>$270</td>
<td>Roof sealant for mold remediation and 3 hours labor</td>
</tr>
<tr>
<td>$447</td>
<td>Food referrals--Hearts with Hands, Manna, Upward Ministries, $1.72 x 20 pound box = $34.40 (Feeding America National Average) x 13 boxes</td>
</tr>
<tr>
<td>$600</td>
<td>Clothing referrals, $100 each for 6 children</td>
</tr>
<tr>
<td>$1,800</td>
<td>Heating Assistance, $600 per family x 3 families</td>
</tr>
<tr>
<td>$1,500</td>
<td>Emergency Assistance, $300 per family x 5 families</td>
</tr>
<tr>
<td>$600</td>
<td>Christmas - toys, clothes, and presents for 2 families</td>
</tr>
</tbody>
</table>

### Donations:
- **$200** Target
- **$575** Wal Mart-3 bicycles at $125
- **$400** Wal-Mart four-$100 gift cards
- **$200** Sam’s Club
- **$768** Cracker Barrel - 12 family pack dinners at $64 each
- **$900** Chik-Fil-A - 300 gift cards for Kid's meal
- **$600** Belks - clothing for two 4-person families
- **$400** Dillards - shoes for two 4-person families

### Volunteer Hours
- **$390** Volunteer hours--assistance with home remediation, cleaning, etc.; 20 volunteers x 10 hours each = 200 hours x $19.48 = $389.60
- **$300** Back to school assistance

### TOTAL
**$22,560**
## NACI Summary of Outcomes 2009-2011

### Environmental Assessments/Asthma In-services

<table>
<thead>
<tr>
<th>School Tested</th>
<th># Students Enrolled</th>
<th># Participants</th>
<th>% of Adults Committing to a Smoke Free Environment</th>
<th>% of Adults Pledging to Create an Asthma Friendly</th>
<th>Smoke Free Site</th>
<th>Environmental Assessment Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buncombe County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mission Hospital Child Development Center</td>
<td>130</td>
<td>8</td>
<td>88%</td>
<td>88%</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Cherokee County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Marble Elementary Child Development Center</td>
<td>120</td>
<td>9</td>
<td>100%</td>
<td>100%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cherokee Indian Reservation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big Cove Child Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dora Reed Child Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Total: Above Child Care Center</td>
<td>250</td>
<td>58</td>
<td>93%</td>
<td>100%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Kituwah Academy/Child Care Center</td>
<td>56</td>
<td>22</td>
<td>82%</td>
<td>82%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Clay County</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Hayesville Elementary Child Care Center</td>
<td>64</td>
<td>8</td>
<td>88%</td>
<td>88%</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Graham County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robbinsville Elementary Child Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robbinsville Middle Child Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robbinsville High Child Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Total: Above Child Care Center</td>
<td>717</td>
<td>40</td>
<td>93%</td>
<td>95%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Haywood County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazelwood Elementary Child Care Center</td>
<td>505</td>
<td>33</td>
<td>94%</td>
<td>97%</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Jackson County</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Smokey Mountain Elementary Child Care Center</td>
<td>400</td>
<td>18</td>
<td>94%</td>
<td>94%</td>
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<td>Madison County</td>
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<td>Mars Hill Elementary Child Care Center</td>
<td>550</td>
<td>18</td>
<td>67%</td>
<td>83%</td>
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<td>Mitchell, Avery, Watauga and Yancey County</td>
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<td>Mountain Heritage High Child Care Center</td>
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<td>Intermountain Child Care Center (Mitchell)</td>
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<td>Cumulative Total: Above Child Care Center</td>
<td>412</td>
<td>39</td>
<td>95%</td>
<td>95%</td>
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<td>Swain County</td>
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<td>Bright Adventurers Pre-K, Swain Co. School</td>
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<td>6</td>
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<td><strong>Totals</strong></td>
<td><strong>3415</strong></td>
<td><strong>259</strong></td>
<td><strong>91%</strong></td>
<td><strong>93%</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td>Event Name</td>
<td>Description</td>
<td>Target Audience</td>
<td>Number of People impacted</td>
<td>Location</td>
<td></td>
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</tr>
<tr>
<td>------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td><strong>World Asthma Day</strong></td>
<td>Asthma education and in-service for elementary-age children</td>
<td>Elementary-age children, school teachers and principles throughout WNC</td>
<td>1,840</td>
<td>School systems in WNC</td>
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<tr>
<td><strong>WNC School Nurse Asthma In-service</strong></td>
<td>Workshop, presentation and training in regards to asthma</td>
<td>School nurses of WNC</td>
<td>120</td>
<td>Western Region of North Carolina</td>
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<td><strong>NC Asthma Summit</strong></td>
<td>Asthma Conference</td>
<td>Health Care Providers</td>
<td>530</td>
<td>Research Triangle Park</td>
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<tr>
<td><strong>Physician In-service</strong></td>
<td>Presentation of EPR - 3 Guidelines and GIP (Guidelines Implementation Panel); NACI Demonstration Project</td>
<td>PCP's from Cherokee Indian Reservation (Tallulah Valley Health Center and Snowbird Clinic); Macon County (Angel Medical Center); Haywood County; Mission Children's Specialist</td>
<td>~ 250</td>
<td>Cherokee Indian Hospital; Mission Children's Rueter Outpatient Center</td>
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<td></td>
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<tr>
<td><strong>Mission Children's Specialist &quot;Lunch and Learn&quot;</strong></td>
<td>Presentation in regards to asthma</td>
<td>Nurses at Mission Children's.</td>
<td>15</td>
<td>Mission Children's Specialist</td>
<td></td>
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<td><strong>Health Professional Asthma In-service</strong></td>
<td>Workshop, presentation and training in regards to asthma</td>
<td>Social Workers</td>
<td>12</td>
<td>Mission Hospital</td>
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<td></td>
</tr>
</tbody>
</table>
National Environmental Leadership Award in Asthma Management

2012 Health Care Provider Recipient

This award is EPA's highest recognition a program and its leaders can receive for delivering excellent environmental asthma management as part of their comprehensive asthma care services. Each year, EPA honors exceptional health plans, health care providers and communities in action.
US EPA Asthma Grant Demographics
October 1, 2012 - September 30, 2014
N  = 61

Age
Average Age  8.4
Age Range  1 - 17

Gender
Male  57%
Female  43%

Ethnicity
American Indian  23%
Caucasian  54%
African American  10%
Hispanic  8%
Hispanic-American Indian  5%

Insurance
Coventry  2%
Medicaid  97%
Unknown  1%

US EPA Asthma Grant 2012-2014
Asthma Severity and Control

Level of Severity (at Baseline)
- Intermittent: 2%
- Mild Persistent: 16%
- Moderate Persistent: 69%
- Severe Persistent: 13%

Level of Control (at Baseline)
- Controlled: 5%
- Not well controlled: 34%
- Very poorly controlled: 61%
## US EPA ASTHMA GRANT DIAGNOSTICS AND COST ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>12 Months Prior to Intervention</th>
<th>Intervention</th>
<th>Cost Avoidance</th>
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<tbody>
<tr>
<td><strong>ED Utilization</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Total Visits</strong></td>
<td>102</td>
<td>8</td>
<td>$98,904.92</td>
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<tr>
<td><strong>IMPACT</strong></td>
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<tr>
<td><strong>Total Costs</strong></td>
<td>$107,322.36</td>
<td>$8,417.44</td>
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<tr>
<td><strong>HOSPITALIZATION/ED</strong></td>
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<tr>
<td><strong>Hospitalizations</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Total Hospitalizations</strong></td>
<td>56</td>
<td>7</td>
<td></td>
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<tr>
<td><strong>Total Charges</strong></td>
<td>$738,472</td>
<td>$92,309</td>
<td>$646,163</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>$745,067.92</td>
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<tr>
<td><strong>QUALITY OF LIFE</strong></td>
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</tr>
<tr>
<td><strong>School Absences</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Average missed days</strong></td>
<td>13.1</td>
<td>3.7</td>
<td>9.6**</td>
</tr>
<tr>
<td><strong>ACT</strong></td>
<td>15.7</td>
<td>22.7</td>
<td>7.1**</td>
</tr>
<tr>
<td><strong>MEASUREMENT</strong></td>
<td><strong>BASELINE</strong>*</td>
<td><strong>POST</strong></td>
<td><strong>Avg. Improvement</strong></td>
</tr>
<tr>
<td><strong>CLINICAL OUTCOMES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FVC</strong></td>
<td>94.4</td>
<td>103.9</td>
<td>9.6**</td>
</tr>
<tr>
<td><strong>FEV1</strong></td>
<td>90.5</td>
<td>99.5</td>
<td>9.0**</td>
</tr>
<tr>
<td><strong>FEF25-75</strong></td>
<td>80.8</td>
<td>92.5</td>
<td>7.6*</td>
</tr>
<tr>
<td><strong>eNO</strong></td>
<td>17.5</td>
<td>20.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Source: Decision Support 2014 Data: $1052.18/ ED Visit

Source: NC State Center for Health Statistics, 2012 Provisional Hospital Discharge Data: $13,187

*** Inclusive of all subjects--SABA, Oral Steroids, Air-trapping

Statistically Significant denoted as * p<0.05 and ** p<0.01 by parametric (paired t-test) and by non-parametric (Wilcoxon Signed Rank) tests

SAS/STAT®. SAS Institute Inc., SAS Campus Drive, Cary, NC 27513
### US EPA Asthma Grant 2012-2014
Environmental - Home Assessments

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Number in Household</td>
<td>5</td>
</tr>
<tr>
<td><strong>Home Assessments</strong></td>
<td></td>
</tr>
<tr>
<td>Smoke in Home</td>
<td>46%</td>
</tr>
<tr>
<td>Pets Inside Home</td>
<td>61%</td>
</tr>
<tr>
<td>Pest Infestation Inside Home</td>
<td>51%</td>
</tr>
<tr>
<td>Carpet in Home</td>
<td>62%</td>
</tr>
<tr>
<td>Water Leak in Home</td>
<td>38%</td>
</tr>
<tr>
<td>Water Leak Outside Home</td>
<td>41%</td>
</tr>
<tr>
<td>Fungal Growth Inside Home</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Heat Source</strong></td>
<td></td>
</tr>
<tr>
<td>Vented</td>
<td>82%</td>
</tr>
<tr>
<td>Un-vented</td>
<td>16%</td>
</tr>
<tr>
<td>Unknown</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Air Conditioning</strong></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>18%</td>
</tr>
<tr>
<td>Window Unit</td>
<td>30%</td>
</tr>
<tr>
<td>Central</td>
<td>49%</td>
</tr>
<tr>
<td>Unknown</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Bed Encasement Present (prior to intervention)</strong></td>
<td>100%</td>
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</table>
## US EPA – Social Determinants of Health

<table>
<thead>
<tr>
<th>Approximate Value</th>
<th>Social Determinants of Health</th>
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<tbody>
<tr>
<td>$4,636</td>
<td>Bedding encasement ($76 per person)</td>
</tr>
<tr>
<td>$1,500</td>
<td>Dodson Pest Control ($125 per visit)</td>
</tr>
<tr>
<td>$2,500</td>
<td>HVAC System (1 family)</td>
</tr>
<tr>
<td>$3,000</td>
<td>Flooring, windows, doors,…</td>
</tr>
<tr>
<td>$960</td>
<td>Plumber (12 hours at $80 per hour)</td>
</tr>
<tr>
<td>$4,920</td>
<td>Bathroom replacement (4 homes)</td>
</tr>
<tr>
<td>$1,350</td>
<td>Roof repair/replacement/sealant</td>
</tr>
<tr>
<td>$5,800</td>
<td>Furniture-beds, sofa, chairs, end tables, lamps, TVs</td>
</tr>
<tr>
<td>$180</td>
<td>Pillows, sheets</td>
</tr>
<tr>
<td>$12,384</td>
<td>Food referrals--Hearts with Hands, Manna, Upward Ministries, $1.72 x 20 pound box = $34.40 (Feeding America National Average) (30 families-12 boxes per family)</td>
</tr>
<tr>
<td>$8,400</td>
<td>Heating Assistance, $600 per family</td>
</tr>
<tr>
<td>$5,100</td>
<td>Emergency Assistance, $300 per family</td>
</tr>
<tr>
<td>$1,200</td>
<td>Christmas - toys, clothes, and presents (4 families)</td>
</tr>
<tr>
<td>$180</td>
<td>Car Seats ($60 each)</td>
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<tr>
<td>$2,000</td>
<td>Clothing Referrals ($100 each)</td>
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<tr>
<td>$240</td>
<td>Dehumidifier (2)</td>
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<td>Donations:</td>
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<td>$200</td>
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<td>$575</td>
<td>Wal Mart</td>
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<td>$200</td>
<td>Sam's Club</td>
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<td>$1,024</td>
<td>Cracker Barrel - 16 family pack dinners at $64 each</td>
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<tr>
<td>$900</td>
<td>Chic-Fil-A - 300 gift cards for Kid's meal</td>
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<tr>
<td>$600</td>
<td>Belks - clothing for two 4-person families</td>
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<tr>
<td>$400</td>
<td>Dillards - shoes for two 4-person families</td>
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<tr>
<td>$7,792</td>
<td>Volunteer hours--assistance with home remediation, cleaning, etc.; 20 volunteers X 20 hours each = 400 hours X $19.48 per hour</td>
</tr>
<tr>
<td>$300</td>
<td>Back to school assistance</td>
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<tr>
<td><strong>$66,341</strong></td>
<td>TOTAL</td>
</tr>
</tbody>
</table>
### US EPA Asthma Grant Summary of Outcomes 2012-2014
#### Environmental Assessments/Asthma In-Services

<table>
<thead>
<tr>
<th>School Tested</th>
<th># Students Enrolled</th>
<th># Staff</th>
<th>Demonstrated Excellent or Improved Knowledge</th>
<th>Adults Committing to a Smoke Free Environment</th>
<th>Adults Pledging to Create an Asthma Friendly Environment</th>
<th>Smoke Free Site</th>
<th>Environmental Assessment Complete</th>
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<tbody>
<tr>
<td>Buncombe County</td>
<td></td>
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<tr>
<td>Emma Elementary School</td>
<td>412</td>
<td>85</td>
<td>27</td>
<td>30</td>
<td>28</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Cherokee County</td>
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<tr>
<td>Marble Elementary School</td>
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<td>16</td>
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<td>Cherokee Indian Reservation</td>
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<td>Kituwah Academy/Child Care</td>
<td>106</td>
<td>35</td>
<td>17</td>
<td>0</td>
<td>21</td>
<td>Yes</td>
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<td>Clay County</td>
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<td>Hayesville Middle School</td>
<td>400</td>
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<td>Graham County</td>
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<td>Robbinsville Middle School</td>
<td>218</td>
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<td>19</td>
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<td>Haywood County</td>
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<td>Junaluska Elementary School</td>
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<td>72</td>
<td>27</td>
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<td>Henderson County</td>
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<td>Mills River Elementary School</td>
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<td>Jackson County</td>
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<td>Cullowhee Valley Elem.</td>
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<td>Macon County</td>
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<td>Nantahala School</td>
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<td>28</td>
<td>18</td>
<td>17</td>
<td>17</td>
<td>Yes</td>
<td>Yes</td>
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<td>Swain County</td>
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<tr>
<td>East Elementary School</td>
<td>425</td>
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<td>West Elementary School</td>
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<td>Total for above schools</td>
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<td>23</td>
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<td>Yancey County</td>
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<td>East Yancey Middle School</td>
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<tr>
<td><strong>Totals</strong></td>
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<td><strong>575</strong></td>
<td><strong>217</strong></td>
<td><strong>166</strong></td>
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<tr>
<td>Event Name</td>
<td>Description</td>
<td>Target Audience</td>
<td>Number of People Impacted</td>
<td>Location</td>
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<td>------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>World Asthma Day</td>
<td>Asthma education and in-service for elementary age children</td>
<td>Elementary-age children, school teachers, and principals throughout WNC</td>
<td>1,762</td>
<td>School systems in WNC</td>
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<td>WNC School Nurse Asthma In-Service</td>
<td>Workshop, presentation, and training in regards to asthma</td>
<td>School Nurses of WNC</td>
<td>110</td>
<td>Western Region of North Carolina</td>
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<tr>
<td>NC Asthma Summit</td>
<td>Asthma Conference</td>
<td>Health Care Providers</td>
<td>293</td>
<td>Research Triangle Park</td>
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<tr>
<td>Children's Environmental Health Western Regional Meeting</td>
<td>Asthma as a Disease State and Creating an Asthma-friendly Environment</td>
<td>Health Care Providers and Environmental Specialists</td>
<td>40</td>
<td>Mission Health System</td>
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<tr>
<td>Health Professional Asthma In-Service</td>
<td>Workshop, presentation, and training in regards to asthma</td>
<td>Health Care Providers</td>
<td>1413</td>
<td>Western Region of North Carolina</td>
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<tr>
<td>Health Initiatives</td>
<td>Asthma Education and Health Initiatives</td>
<td>School-age children, principals, teachers, parents and other professionals</td>
<td>774</td>
<td>Western Region of North Carolina</td>
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<td></td>
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<tr>
<td>Mountain Air Conference</td>
<td>Asthma as a Disease State and Creating an Asthma-friendly Environment</td>
<td>Health Care Providers</td>
<td>40</td>
<td>MAHEC</td>
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<tr>
<td>CHEST</td>
<td>Regional Asthma Disease Management Program presentation</td>
<td>Health Care Providers</td>
<td>100</td>
<td>Atlanta, Georgia</td>
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<tr>
<td>AARC Congress</td>
<td>Regional Asthma Disease Management Program Asthma Abstract Presentation</td>
<td>Health Care Providers</td>
<td>5491</td>
<td>New Orleans, Louisiana</td>
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<tr>
<td>Pediatric/Neonatal Conference - Child and Family Together</td>
<td>Asthma as a Disease State and Creating an Asthma-friendly Environment</td>
<td>Health Care Providers</td>
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Regional Asthma Disease Management Program
Population-Based Healthcare
Grant Outcomes Summary

ED VISITS*

*Results compiled by Mission Health System Research Institute
Regional Asthma Disease Management Program
Population-Based Healthcare
Grant Outcomes Summary

HOSPITALIZATIONS*

NACI 2009-2011

Prior: 60
Post: 3
Cost Avoidance: $648,477

EPA 2012-2014

Prior: 56
Post: 7
Cost Avoidance: $646,163

*Results compiled by Mission Health System Research Institute
Regional Asthma Disease Management Program
Population-Based Healthcare
Grant Outcomes Summary

SCHOOL ABSENCES*

*Results compiled by Mission Health System Research Institute
Regional Asthma Disease Management Program
Population-Based Healthcare
Grant Outcomes Summary

EXHALED NITRIC OXIDE (FeNO)*

*Results compiled by Mission Health System Research Institute

Prior
Post

NACI 2009-2011

EPA 2012-2014

23.9
21.1
20.5
17.5
### Regional Asthma Disease Management Program
#### Population-Based Healthcare
#### Grant Outcomes Summary

**PULMONARY FUNCTION TESTS***

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<td>102.4</td>
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<td>99.5</td>
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</tbody>
</table>

*Results compiled by Mission Health System Research Institute*
Social Determinants of Health
Collaborations with various community organizations are utilized to address other socioeconomic barriers and implement solutions:

- Regional churches
- Youth Groups
- Eblen Foundation
- Food Services
- Pest Management entities
- Social Services
- Non-profit organizations

$88,901 + medications
The Regional Asthma Disease Management Program embraces the holistic approach to patient care through compassion and patient advocacy.
Indoor Environmental Trigger Management as Part of a Comprehensive Approach to Asthma Control

North Carolina Forum on Sustainable In-Home Asthma Management
September 13, 2016

Elizabeth Cuervo Tilson, MD, MPH
Medical Director, Community Care of Wake and Johnston Counties
Prevalence of asthma

- Behind dental disease, asthma is the most common chronic disease of childhood
- Prevalence of current asthma about 10%
- There is a disparity between populations

North Carolina Child Health and Assessment Monitoring Program (CHAMP). North Carolina Center for Health Statistics
Summary Health Statistics for U.S. Children: National Health Interview Survey, 2010
% of NC Children Who “Currently Have” Asthma by Race/Ethnicity

- Total
- White
- African American
- Other Minorities
% of NC Children Who “Currently Have” Asthma by Insurance Status
Community Care of NC

- Statewide primary care medical home & care management system for Medicaid and other populations
  - Defined as Primary Care Care Management (PCCM) program for Medicaid
- Improve access to, quality of and coordination of care and decrease cost of care
- 14 local Networks, 1 central office, all 100 NC counties, more than 4500 Primary Care Physicians (1360 medical homes), 1.4 million enrollees
- Resources to providers to help better manage their populations, including data, QI support and multi-disciplinary care management
- Connect different segments of the local health care community to create local systems of care
What is Community Care of Wake and Johnston Counties?

- CCWJC is one of the 14 local Community Care of North Carolina (CCNC) networks serving Carolina Access Medicaid patients and their primary care providers
- 125,000 recipients
- 162 Primary Care Medical Homes
Comprehensive Asthma Program

- Support for primary care providers
- Education and tools for best practice management
- Data to help inform patient care
- Care management of high risk patients
- Environmental Assessments as part
Why add the Environmental Assessment Piece?

- 2007 National Heart, Blood, Lung Institute
  [http://www.nhlbi.nih.gov/guidelines/asthma/index.htm](http://www.nhlbi.nih.gov/guidelines/asthma/index.htm)
  - Reducing exposure to inhalant indoor allergens can improve asthma control
  - A multi-faceted approach is required

- 2008 Community Preventive Services Task Force
  [http://www.thecommunityguide.org/asthma/index.html](http://www.thecommunityguide.org/asthma/index.html)
  - Recommends the use of home-based, multi-trigger, multi-component interventions with an environmental focus for children with asthma
  - Cites strong evidence of effectiveness in reducing symptom days, improving quality of life or symptom scores, and in reducing the number of school days missed.

- 2011 American Journal of Preventive Medicine
  [Am J Prev Med 2011;41(2S1)]
  - Poor housing quality strongly associated with poor asthma control even after controlling for confounders such as income, overcrowding, smoking, unemployment
May be particularly important in addressing health disparities

- Perhaps some of the disparity in prevalence is due to differential exposure to environmental triggers from low-income housing

- Further exacerbated by vulnerability of families in rental housing to make changes
Environmental Asthma Trigger Home Assessment Program

- Multi-disciplinary, multi-component home visits and follow ups (Registered Nurse, Registered Sanitarian, PharmD)

- Partnership of CCJWC, Wake County Human Services and Wake County Environment Services
  - WCHS and WCES - 0.5 FTE Environmental Health Specialist (EHS) for Wake County patients
  - CCWJC – RNs, Pharm Ds, Data, Patients, PCPs

- Tailored education provided to family

- Durable goods to modify triggers (e.g. mattress and pillow encasings)

- Housing/legal resources shared as needed

- Detailed Report Provided To PCP

- Database - 1 year pre and 1 year post assessment
Qualifications for In-home Environmental Assessments

- All asthma patients in Wake County are eligible for multi-disciplinary in-home assessments with EHS
- In Johnston County, no EHS support but RNs and PharmDs
- Priority placed on patients that have:
  - Poor Asthma literacy and control
  - Emergency Department visits, hospitalizations
  - Poor medication compliance
  - Identified environmental concern (pests, mold, fumes, etc)
Identifying Clients Who Would Benefit

- **Referrals**
  - Hospital Admissions, Emergency Visits, Direct PCP Referrals and Priority Patients identified by data

- **Interventions for all Asthma patients**
  - Medicaid claims review to assess PCP/Specialty links, ED and Hospital use and Medication lists/fill information
  - Telephonic asthma assessment for determination of educational and environmental needs
Details of In-Home Assessments

- RN Care Managers provide general asthma education on medications, triggers and control

- Environmental Health Specialist inspects home for possible triggers and provides education

- RN and EHS identify other environmental needs (mattress and pillow case encasings, roach containment, HEPA vacuum, dehumidifier, etc.)

- Pharm D does the Medication Reconciliation

- Contact information for agencies that can advocate for families is given if needed
Environmental Asthma Triggers Evaluated During Assessments

- Dust mites
- Chemical Irritants
- Pest
- Second Hand Smoke
- Mold/Excessive Moisture
- Combustion By Products
- Warm Blooded Pets
- Other (Factors specific to that assessment)

Categorized into Client-based and/or Landlord-based factor
Equipment/Methods of Assessment

- Visual evaluation of home to identify triggers (Interior and exterior)

- Use of hydrometer to determine relative humidity throughout home (Important for mold/moisture and dust mites)

- Use of flashlight to determine cleaning, ventilation, and pest problems.

- Low cost
CHEMICAL IRRITANTS
Chemical irritants found in some scented and unscented products in your home, such as cleaners, paints, adhesives, pesticides, cosmetics, or air fresheners, may make your child's asthma worse.

What you can do?
- Use these products less often, and make sure your child is not around when you use the products. Also, consider trying different products.
- Take great care to follow the instructions on the label. Open windows or doors and use an exhaust fan.
- Limit use of products and materials that give off strong odors and irritants, such as:
  - air fresheners sprays, air wicks, scented candles, plug ins
  - chalk dust
  - cleaning sprays and products
  - hair sprays
  - insect sprays
  - smoke
  - strong perfumes
  - body powder
Toxic-Free Pest Control from your Pantry

Toxic Free NC common sense pest control recipe

Roach Balls
1 cup borax
1/4 cup sugar
1/4 cup mixed onion
1 Tbsp. Cornstarch
1 Tbsp. Water
Make a paste of the ingredients and roll into little balls.
To use: Place 2 or 3 balls in a sandwich bag anywhere you have a roach problem. The roaches will eat the balls and carry them home to their nests, where they will die.

Boric acid or borax is safe to handle, though inhaling it in large amounts can irritate the respiratory tract. Because it is not a nerve poison, roaches will not become resistant.

Toxic Free NC common sense pest control recipe

Ant Bait
3 cups water
1 cup sugar
4 tsp. Borax
To use: Mix together and place the mixture in 3 to 6 screw top jars. Loosely pack with cotton wool. Screw the lids on tightly and seal with tape. Poke holes in the lid and place near points of entry, or along ant trails, for best results.

Boric acid or borax is safe to handle, though inhaling large amounts can irritate the respiratory tract. Clearly label the jar as POISON and keep away from pets and curious children.

Toxic Free NC common sense pest control recipe

Mold & Mildew Killer
1/2 cup white vinegar
1 1/2 cup borax
2 cups warm water
Pour or spray onto moldy areas and let sit for a few minutes, then scrub off with a brush. If mold is still visible, repeat application. Do not save the leftover mixture.

Toxic Free NC common sense pest control recipe

Herbal Insect Repellent
15 drops lavender oil
15 drops tea tree oil
10 drops citronella oil
10 drops eucalyptus oil
10 drops cedarwood oil
In a small bottle, mix these with about one ounce of your favorite unscented skin oil (olive oil works fine).
Not recommended for pregnant women. Keep out of your eyes. Try a small amount on your wrist first to check for skin allergies. Experiment with different ingredients to develop your own blend!

Find out more about toxic-free alternatives to pesticides at www.ToxicFreeNC.org
Post Assessment

- A detailed report is provided to parent and PCP with:
  - Findings and recommendations of Assessment
  - Education And Supplies Provided
  - Medication Reconciliation

- With family permission, a letter and copy of report is provided to landlords, if applicable

- A 6-week repeat home visit is made by RN Care Manager
  - Assesses compliance with recommendations
  - Gives recommended supplies (e.g. Hepa Vacuum, food containers, etc)
Wake County Environmental Services and Community Care of Wake & Johnston Counties

Environmental Asthma Trigger Assessment

Patient ID#
Location Address
City Raleigh  State NC  Zip

1. Dust mites: Contributing factors present Client Factors not present □
   Observations: Keep exterior doors and windows closed as much as possible to keep out pollen, dust, and
   humidity. Regulate the interior temperature in the home with the centralized air conditioning system.
   Recommend a HEPA filter vacuum cleaner for the client family to use.

2. Chemical Irritants: Contributing factors present Client Factors not present □
   Observations: Do not use plug in air fresheners or automatic aerosol air fresheners in the home.
   Chemical fumes and aerosol particles from these items could be asthma triggers.

3. Pest: Contributing factors present n/a Factors not present □
   Observations:

4. Second Hand Smoke: Contributing factors present Client Factors not present □
   Observations: Mother smokes. Family and friends of family who do smoke should not smoke in the
   child's presence. Example: Do not smoke inside the home or in vehicles used by the child. Recommend
   that the mother stop smoking to limit the child's exposure to this known asthma trigger.

5. Mold/Excessive Moisture: Contributing factors present n/a Factors not present □
   Observations:

6. Combustion By Products: Contributing factors present n/a Factors not present □
   Observations:

7. Warm Blooded Pets: Contributing factors present n/a Factors not present □
   Observations:
   Comments: Monitor outdoor air quality daily. Limit the child's outside activities on days with poor air
   quality. Examples: Days with high levels of pollen, ozone, smog, air pollution, and humidity.
   # of client dependant triggers: 3
Asthma ED rates - CCWJC
Asthma Hospitalization rates - CCWJC

H1N1
• 1 year pre vs 1 year post intervention

• Average Savings per patient - $707
How We Finance It Currently

- CCNC/CCWJC per member per month (PMPM) revenue – PCCM Management
  - Multi-disciplinary staff (MD, RNs, Pharm Ds, SWs)
  - Patient education tools
  - Work with and communication back to providers
  - Data feeds for referral and data analysis for evaluation

- Wake County Human Services and Wake County Environment Services budget
  - 0.5 FTE Environmental Health Specialist (EHS) for Wake County patients

- Durable goods to modify triggers (e.g. mattress and pillow encasings) ~$2000 a year
  - Not allowable to purchase through PMPM of current PCCM model in NC
  - Unrestricted funds/donations/contributions – particularly Wake County Asthma Coalition

- Housing/legal resources
  - Other dedicated agency funding (e.g. Legal Aid, Housing Authorities)
  - Unrestricted donated funds for rare emergency situations (e.g. breaking a lease)
Other Possible Financing Mechanism - Medicaid

Asthma Education component

- Medicaid Clinical Coverage Policy 10D, Independent Practitioners Respiratory Therapy Services, Subsection 5.2.2
  - Shared by Robin Morrison, M.A. CCC-SLP, Coordinator Outpatient Specialized Therapies, Clinical Policies and Programs, Division of Medical Assistance

- For Medicaid and NCHC beneficiaries diagnosed with asthma or other chronic respiratory disease, a maximum of 15 respiratory therapy visits during a six (6) consecutive month time frame can be requested for Prior Authorization. Additional visits can be requested by a new Prior Authorization request.

- Prior approval must be requested by the Medical Provider under the billing NPI.

- The Independent Practitioner (RT) primary service objective is to provide education that enables the beneficiary and/or parent/guardian to independently follow and comply with the beneficiary’s written Action Plan (AP).

Limitation

- Does not address multi-disciplinary support
- Does not address environmental triggers
Other Possible Financing through Medicaid

- Current Medicaid model in NC is a Primary Care Care Management (PCCM) model
  - Limits what you can cover to more direct health care services and care management/education
  - Does not allow for coverage of modifying items (e.g. mattress covers and roach control) or other resources directed at Social Determinants of Health (e.g. housing)
- May be allowable, if defined as part of other Medicaid waivers
  - 1115 Innovation Waiver – NC is pursuing as part of Medicaid Reform for physical health
  - 1915 (b)/(c) Managed Care Waiver - In place for behavioral health (LME/MCO)
Thank you!

Questions?

btilson@wakedocs.org

919-792-3621
North Carolina
State of the State

OPEN DISCUSSION
Neasha Graves, Moderator
Healthcare Financing of Home-based Asthma Services

Amanda Reddy
Panel: Pilot Programs and Perspective on Sustainable Asthma Management Models

Amanda Reddy, Moderator
Promoting Sustainability for Community Health Worker-led Asthma Home Visiting

Lessons from the New England Asthma Innovations Collaborative

Presented at the North Carolina Forum on Sustainable In-Home Asthma Management

Stacey Chacker
September 13, 2016

NEIAC is an initiative of Health Resources in Action’s Asthma Regional Council of New England
NEAIC is a project of the Asthma Regional Council of New England, a program of Health Resources in Action

- Established in July 2012 with a $4.2 million Award from Centers for Medicare and Medicaid Innovation.

The project (NEAIC) described was supported by Grant Number 1C1CMS331039 from the Department of Health and Human Services, Center for Medicare & Medicaid Services. The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of the U.S. Department of Health and Human Services or any of its agencies.
New England Asthma Innovation Collaborative

Goals and Partners

For children with poorly controlled asthma:
• Improve quality of care
• Improve health and quality of life outcomes
• Decrease health care utilization costs
• Advance sustainable payment systems

In four states:
• Nine Health Care Providers
• Policy and Training Partners
• Seven Medicaid Payers
  - MMCOs
  - State Medicaid Offices
1145 participants from January 2013 – June 2015,

• **Assess** patients’ needs and home environment
• **Provide** asthma self-management education
• **Deliver** cost-effective environmental supplies
• **Improve** quality and experience of care:
  o Client-centered, use of motivational interviewing
  o Promote asthma action plans
  o Promote connections to primary care & prevention
  o Referrals for social services

**Target Population**
  o Aged 2 – 17 years old
  o Medicaid or CHIP beneficiary
  o A diagnosis of asthma from an authorized clinician
  o Poorly controlled asthma
Community Health Workers

- Frontline public health worker
- Understanding of the experience, language, and/or culture
- Liaison between healthcare and community
- Culturally competent service delivery
- Advocate for individual and community needs.
- Peer education
- Social support and advocacy
- Access to services
Evaluation

• Intervention: home visit / follow-up phone call data
  o Caregiver self-report (44Qs)
    - 1st, last home visit, 6, 12 mos.
  o Environmental observations (36 items)
    - 1st & last home visit

• Parent/Guardian focus groups

• Claims and encounter data:
  o All claims
  o 12 months pre/post
  o Comparison population from claims
The Intervention Works!

Data from home intervention shows
• Improvements to the home environment
• Improved Quality of Life
• Improved Asthma Control
• Decreased number of ER visits, number and length of hospital stays = cost savings!

Parent, “my son hasn’t been to the hospital in eight months!” and “I don’t know why health insurance doesn’t pay for this!”
Health Care Utilization – Caregiver Report

Health Care Utilization Pre- and Post- Intervention

Note: For each health care utilization measure, differences between time intervals are statistically significant (p < .05*).
“He missed 20-30 days of school a year before the program. He hasn’t missed any school since the program.” – Focus Group Participant

Missed Work and School in the Past Six Months

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<th>Time Interval</th>
<th>Average Days of Missed Work</th>
<th>Average Days of Missed School</th>
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<tr>
<td>6 month follow-up phone call</td>
<td>1.18</td>
<td>2.71</td>
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Note: Differences between time intervals are statistically significant ($p = .000^*$).
### Asthma Control and Environmental Triggers

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<td>Visit 1</td>
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<tr>
<td>Well controlled</td>
<td>22.9%</td>
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<tr>
<td>Not well controlled</td>
<td>45.3%</td>
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<tr>
<td>Very Poorly controlled</td>
<td>31.7%</td>
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<td>Visit 1</td>
<td>Visit 3</td>
</tr>
<tr>
<td>Mold</td>
<td>46.6%</td>
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</tr>
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<td>Pests</td>
<td>36.1%</td>
<td>25.6%</td>
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<td>Smoke</td>
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<td>Pets</td>
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<td>Chemicals</td>
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<tr>
<td>Dust</td>
<td>69.0%</td>
<td>38.4%</td>
</tr>
</tbody>
</table>

Note: Differences between time intervals are statistically significant ($p = .000^*$).
Claims and Encounter Data shows Decreases:

- 90% in asthma-related ER visits (26% greater than comparison)
- 60% in overall ER visits (14% greater than comparison)
- 80% in use of oral corticosteroid (23% greater than comparison)
- $1104 in total health care costs

Note: These results have not been verified by CMMI’s evaluator, and are based on six months pre-post for 51 patients

Final economic analysis for 12 months pre-post in progress. Anticipate data for 600 patients.
Other Program Benefits

• Better understanding of asthma and asthma meds
• Increase of use of Asthma Action Plans
• High caregiver satisfaction
• Families receive referrals for social services
• Benefits may extend to all household members from participation
Payers as Partners

• Invite/recruit early in process - start with Medical Directors

• Outline problem and program goal

• Emphasize possible benefits – e.g.
  o Members receive high-quality services, reducing utilization
  o Capacity built in payer’s service area
  o May compliment payer’s case management services
  o Payer gets data on health outcomes, quality of life and cost
  o Recognition

• Specify the “ask” – e.g.
  o Meetings
  o Claims data
  o Referrals
  o Discussing piloting new payment models and policy change
Securing Claims and Encounter Data

- **Health economist:** specify data needed & time period.
  - NEAIC request: All claims and encounter data for all pediatric patients ages 2 – 17 years old with diagnosis of asthma – for intervention population and to develop comparison group

- Assure **HIPAA compliant** environment

- Develop secure **data transfer protocols**
  - Be sure to include all which will need access to data (for NEAIC – CMS)

- **Patient Consent Forms** – specifying purpose for sharing data, and entities it will be shared with.
Securing Claims and Encounter Data

- Work with Payer Compliance Offices to determine and draft **necessary agreements** (usually Data Use Agreements (DUA)); budget for legal review.

- Develop **specifications**.

- **Comparison group** (beware of other existing interventions that may impact findings)

- Remind payers in advance for data draw.

- Review all data for completeness as soon as receive.

- Be prepared to **negotiate and problem solve**.

- Relationship building is important and ongoing!

Health Resources in Action
NEAIC Payer Assessment

Purpose: To gain a better understanding of:

• Factors important to payers when considering providing/paying for home-based asthma interventions

• Views about supporting CHWs as part of clinical teams for asthma
Assessment Key Findings

• New England Payers are receptive to asthma home visiting programs and CHW workforce. Need assurances of standards in training and qualifications.

• Payers and providers both need information re: CHW field and how to implement the pediatric asthma intervention effectively.

• Priority for evidence needed to promote financing:
  • Cost-benefit and improved health outcomes.
  • Need, especially among a payers’ membership
  • Impact on QI measures and patient satisfaction.
Evidence of clinical effectiveness and an adequate cost-benefit ratio are central.

- **Cost alone will not drive the decision.**

- Improvements in health care quality, patient experience of care, and meeting HEDIS measures important.

- Compelling if clinical improvements and savings are shown for payer’s members or service area and linked to evidence of need.
Other Learnings

• **Accountable Care Organizations** or “Provider-led Entities” (aka Providers) - becoming **key decision makers in coverage of services**

• Payers and/or ACOS may “buy” or “build” services

• **In-home interventions** may benefit a family – promote, and if possible measure.

• Emphasize - **Social Determinants of Health**

• Deploy “**right size**” **intervention** – based on risk
Pursuing Sustainable Financing and Spread

Current sustainability and spread:
- Community benefits
- Departments of Public Health
- Donor funding
- MMCO
- Boards of Health

Continuing efforts/opportunities:
- **Accountable Care Organizations**
- CDC 6|18 Initiative
- MMCO
- 1115 Waivers
- Delivery Systems Reform Incentive Payment Programs
- Pay for Performance (or Social Impact)
Questions and Thank You!

• Stacey Chacker, Co-PI Project Director schacker@hria.org

• Heather Nelson, PhD, MPH, Co-PI and Evaluator hnelson@hria.org

“The project described is supported by Grant Number 1C1CMS331039 from the Department of Health and Human Services, Centers for Medicare & Medicaid Services. The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of the U.S. Department of Health and Human Services or any of its agencies.”
North Carolina Forum on Sustainable In-Home Asthma Management

Frances Martini, BSN, MBA
September 13, 2016
Who We Are .......
Background

- Report on asthma prevalence, environmental risks factors and patient medical utilization
- In the top 20 cities of challenging places to live with Fall allergies in 2015, Memphis ranked 4th, Knoxville 6th, Chattanooga 15th, Nashville 20th

Why is a Managed Care Organization (MCO) Interested in Asthma?

- Asthma continues to be a serious public health problem.

- Asthma is identified in the top 10 primary disease conditions for high cost claims in the our BlueCare population.

- We are on a fixed income.
Primary Chronic Disease Incidence and Cost

BlueCare All (excluding Select Kids, CHOICES, Select Community, BC Plus)

Ages 4 and Under

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<th>Top 10 Chronic Conditions</th>
<th>Percent of Total Paid Dollars</th>
<th>Percent of Members</th>
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<tr>
<td>Congestive Heart Failure</td>
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<tr>
<td>Asthma</td>
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<tr>
<td>Cancer</td>
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<td>Behavioral/Chemical Dependency</td>
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<td>Cardiovascular Disease</td>
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<td>Obesity</td>
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<td>Ear, Nose, Throat</td>
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</table>
Primary Chronic Disease Incidence and Cost

BlueCare All (excluding Select Kids, CHOICES, Select Community, BC Plus)

Ages 5 to 20

Top 10 Chronic Conditions

<table>
<thead>
<tr>
<th>Top 10 Chronic Conditions</th>
<th>Percent of Total Paid Dollars</th>
<th>Percent of Members</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Period 1</td>
<td>Period 2</td>
</tr>
<tr>
<td>Behavioral/Chemical Dependency</td>
<td>17.9%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Asthma</td>
<td>16.9%</td>
<td>17.3%</td>
</tr>
<tr>
<td>Cancer</td>
<td>12.2%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Obesity</td>
<td>11.8%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Neurology</td>
<td>5.6%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>6.6%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>6.8%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6.4%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Hematology</td>
<td>4.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Neonatal</td>
<td>4.8%</td>
<td>1.4%</td>
</tr>
<tr>
<td></td>
<td>3.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>3.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td></td>
<td>2.4%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>2.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>0.8%</td>
<td>0.3%</td>
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<tr>
<td></td>
<td>1.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td></td>
<td>0.5%</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>0.7%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
Problem

- An individual’s care is often fragmented and treatment compliance is difficult to evaluate.
- It may be difficult and challenging for primary care providers to ascertain what monitoring or medications are lacking for each patient/member.
- Members may seek care for their asthma in multiple settings (primary practitioner office, specialist office, hospital, home health care, emergency room, community outreach events/health fairs) and therefore the primary practitioner may not have a comprehensive picture of the member.
Identified Barriers from 2015 Analysis

- Impact of healthcare disparities
- Member/parent or guardian non-compliance / failure to adhere to treatment recommendations and obtain appropriate follow-up care
- Members are unreachable / failure to show for scheduled appointments/case manager is unable to contact them
- Lack of provider awareness / lack comprehensive picture of member behavior / ED utilization and follow up
- Inability to adequately assess home environment and remediate triggers
Analysis of Disparities in our Population

- Disparities in health care and outcomes exist across all diseases or conditions for many reasons.
- The National Healthcare Quality and Disparities Report found that people in poor households experienced the largest number of healthcare disparities.
- BlueCare of Tennessee has a vested interest in identifying and addressing healthcare disparities among its membership. We do an annual assessment of key conditions is necessary to determine the scope of the disparities found in the our population.
Top 10 Conditions for BCT Hispanic Children

- Obesity: 8.0%
- Asthma: 6.9%
- Pneumonia: 2.4%
- Depression/Bipolar: 1.1%
- Metabolic: 1.5%
- Hyperlipidemia: 1.6%
- Endogland: 0.9%
- Hypertension: 0.8%
- Diabetes: 0.5%
- Cancer: 0.4%

Hispanic Children vs. All Other Races
Top 10 Conditions for BCT Asian Children

- **Asthma**: 5.2%
- **Obesity**: 2.4%
- **Pneumonia**: 2.2%
- **Depression/Bipolar**: 1.9%
- **Metabolic**: 1.8%
- **Endogland**: 0.8%
- **Hyperlipidemia**: 0.7%
- **Hypertension**: 0.5%
- **Diabetes**: 0.4%
- **Cancer**: 0.2%

Comparison with All Other Races:
- **Asthma**: 9.0%
- **Obesity**: 4.7%
- **Pneumonia**: 5.1%
- **Depression/Bipolar**: 1.0%
- **Endogland**: 0.6%
- **Hyperlipidemia**: 0.9%
- **Hypertension**: 0.6%
What did we do with this information?

- Identified counties where these populations are.
- Evaluated the delivery system, resources, specialty services available.
- Eliminated telephonic management where possible.
- Deployed our staff living in these communities to ensure our staff matched the makeup/characteristics of the population.
- Coordinated with external partnerships including providers (practitioners, facilities and ancillary service), community partners (housing, food, clothing, medication assistance, financial assistance, child care services).
- Require diversity training for all staff at hire and annually.
- Established a disparities advisory panel in each region to better understand the population and gain insight into best ways to reach the population.
Interventions (Actions for Improvement)

- Improve the coordination of care
  - PCP follow after 3 or more asthma related ED visits in 3 months.
    - Outreach to member/parent/school
    - Engage PCP
    - Assess member – Face to face
    - Facilitate the coordination of care and exchange of information between the ED, PCP and the home health care.
  - Place embedded care coordinator in 2 high volume pediatric provider offices (Memphis - 2013 and Johnson City - 2015) and in 33 PCMH practices to facilitate the coordination of the members care.
  - Developed a pilot program to coordinate with school health services. Implemented for 2016/2017 school year.
We are continuing efforts to change the trend

- Educational outreach – local, face to face
- Support of in-school clinics/telemedicine
- Community resources/coordination
- Disparity advisory panels
- Payment for home health visits for education
- Payment for home environmental assessments
- Plan for payment of home remediation (CEA)
- Initiatives to incentivize both the member and the provider.
  - Pay for gaps
  - Pharmacy calls to members
Asthma CarePartners
An Innovative Care Management Collaboration

Family Health Network
and Sinai Urban Health Institute

September 13, 2016
Agenda

1. FHN and SUHI Introductions
2. Sinai Asthma Initiatives
3. Asthma CarePartners Program
   - Components
   - Outcomes
4. FHN/Payer’s Perspective
5. Recommendations for Sustainability
Family Health Network

- FHN’s mission is to “provide access to cost effective quality health care for people who could not otherwise afford it.” We do so through enrollment in our health plan and also through the support we provide to Safety Net Providers.

- Our Vision is “To be the health plan of choice in our market and the leader in improving health outcomes.”

- Founded in 1995, FHN is the only not-for-profit health plan in Illinois.

- Serving over 240,000 FHP/ACA members in northern Illinois.

- Founding partner with Sinai Urban Health Institute for Asthma CarePartners program.
Sinai Urban Health Institute

- Founded in 2000 and is part of Sinai Health System on the west side of Chicago.

- SUHI conducts award winning research that has:
  - Defined the scope and depth of health status and health services access disparities in our communities
  - Led us to design, implement and refine high impact, cost saving community-based intervention strategies for a number of chronic health conditions, including asthma and diabetes
Sinai Asthma Initiatives

• SUHI has implemented a series of nine comprehensive interventions; four are currently underway

• Goals:
  – Decrease asthma-related morbidity and mortality
  – Improve quality of life for people living with asthma
  – Decrease costs

• Each program has built on the successes and shortcomings of its predecessors

• Partner extensively with other organizations
Sinai Asthma Initiatives

Four of the interventions paved way for creation of Asthma CarePartners program:

• Pediatric Asthma Initiative 1: 2000-02
• Pediatric Asthma Initiative 2: 2004-06
• Controlling Pediatric Asthma Through Collaboration and Education: 2006-08
• Healthy Home, Healthy Child: Westside Children’s Asthma Partnership 2008-11

• Grant funded and all rigorously evaluated
• Consistent and powerful outcomes
Sinai Asthma Initiatives: Key Lessons

• Issues that impede a family’s ability to manage asthma are complex and often require varying areas of expertise.

• CHWs are immensely effective in establishing relationships of trust with the families they serve.
  – Consequently, in the best position to address the barriers families face in properly managing asthma

• CHW approach is associated with significant cost-savings.
  – PAI-1: $7.79 per dollar spent (Group 3)
  – PAI-2: $5.58 per dollar spent
  – CPATCE: $3.38 per dollar spent (Sinai)
  – HHHC: $4.54 per dollar spent
Sinai Asthma Initiatives: CHW Model

- APHA defines a Community Health Worker (CHW) as:
  "...a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served."

- CHWs are the agent of change
- CHWs are hired from the target community
- No prior medical or asthma experience required
- Knowledge of the community and passion to help others
- Host a pre-hire training course prior to interviewing potential CHWs
Training CHWs

• Training and preparing CHWs to conduct home visits is an extensive process that includes:
  – 40 hour CHW core skills curriculum:
    • principles of community health, motivational interviewing, communication skills and collaborating with medical professionals
  – 40 hour asthma training:
    • disease pathophysiology, medications and devices, triggers and home environmental issues
  – Shadowing visits with experienced CHWs
  – Three levels of role-play evaluations with a mock participant, each progressively more complex
  – Shadowed by CHW supervisor for three to five visits
Asthma CarePartners (ACP)

- Physician champions assisted in establishing program integration to models of care coordination via Medicaid managed care (FHN) and private insurer (BCBSIL)

FHN Program Referrals:

- Care coordinators stratify members to determine benefit potential, and obtain consent from the member prior to referral:
  - ACT > 19, high risk asthma profile
  - Asthma related hospitalizations, ER visits
  - Medication utilization or non-compliance
  - Expressed need from member, parent, care manager, practitioner
ACP Program Components

• Six CHW visits during the 12 month intervention which include:
  – Home environment assessment
  – Development of Asthma Action Plan (AAP)
  – Asthma Education: Action Plan, Triggers, Medication / Device
  – ACT (Asthma Control Test) administered monthly
  – Follow up phone calls on non-visit months

• Contact with provider, nurse care coordinator and interdisciplinary team

• Partnership with Metropolitan Tenants Organization, a tenants rights group

• Program provides “Healthy Home” resources such as asthma-friendly cleaning kits and/or supplies to control pests, dust mites, mold, etc.
ACP Outcomes

- As of 6/1/16, 1,024 referred to program, 608 enrolled

- Of those participating in the program, 135 had completed the 12-month intervention (99 children, 36 adults)

- Healthcare utilization decreased dramatically and symptoms have been reduced

- Reduction in missed work and school days

- Process measures evaluated
Impact Story

• 8 year-old African American girl

“Gloria is my daughter's asthma care instructor!! Because of Gloria my daughter’s asthma has improved DRASTICALLY!! GLORIA SEALS IS AWESOME!! She knows how to explain the nature of asthma and the importance of the medication!”

“Before Gloria, my daughter and I were lost and in the dark about her illness. My daughter was very quiet and introverted because she was sick ALL THE TIME!! She'd missed 36 days of school and her grades were low. Also Lelah had been to the hospital so many times that the staff knows us by name!!”
Payer Perspective

Program Goals:

1. Maximize participation of high risk members
   • Effective recruitment
   • Retention and completion

2. Achieve Sustainability through the Triple Aim:
   • Improved population health
   • Reduction in avoidable cost
   • Member experience and quality of life
Challenge: Program Recruitment

Barriers
- Referral Goal = 7/week;
  - Avg = 4.5/week
- Recruitment Goal = 5/week;
  - Avg = 3/week

Interventions in Progress
- Careful assessment for program eligibility
- Immediate phone transfer from FHN care coordinator to program intake
- Direct community outreach for hard-to-connect
- Use of “doorhanger” notices to incent call back
Challenge: Program Retention

Barriers
• Goal = 75% at 12 months
  – Avg = 25%

Interventions in Progress
• Close collaboration between SUHI and FHN care teams
• Weekly rounds for case review and barrier analysis
• Systems integration (health plan record)
• SUHI team facilitates redetermination education for member retention at health plan
Tools to Evaluate ACP Outcomes

✓ **Asthma Control Test** – measures the degree to which a person’s asthma is controlled monthly

✓ **Pediatric Asthma Caregivers Quality of Life Questionnaire** – measures the quality of life of the child’s primary caregiver (baseline, 6, and 12 months)

✓ **Asthma Quality of Life Questionnaire** – measures the quality of life of adult asthma patients (baseline, 6, and 12 months)

✓ **Home Environmental Assessment** – evaluates the participant’s home environment and identifies triggers in the home (1, 6, and 12 months)
Results: Health Resource Utilization

Figure 1: Asthma-related Health Resource Utilization in the Year Prior to and During the Intervention (n=135)

*Statistically significant difference found (p<0.05) using Wilcoxon signed-rank non-parametric test
Results: Symptom Frequency

Figure 2: Symptom Frequency in the past 2 weeks at Baseline vs. Average During Follow-up Year (n=135)

<table>
<thead>
<tr>
<th></th>
<th>Daytime Symptoms*</th>
<th>Nighttime Symptoms*</th>
<th>Rescue Meds Needed*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom Frequency</td>
<td>5.4</td>
<td>5.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Number of Days</td>
<td>2.1</td>
<td>1.9</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*Statistically significant difference found (p<0.05) using Wilcoxon signed-rank non-parametric test
Results: Caregiver Quality of Life

Figure 3: Caregiver Asthma-Related Quality of Life Scores at Baseline and at Twelve Months Following the Intervention (n=84)

* Statistically significant difference found (p<0.05) using Wilcoxon signed-rank non-parametric test
Results: Adult Quality of Life

Figure 4: Adult Asthma-Related Quality of Life Scores at Baseline and at Twelve Months Following the Intervention (n=32)

- **Symptoms***: Baseline 3.8, 6 Months 5.1, 12 Months 5.6
- **Environmental***: Baseline 4.2, 6 Months 4.7, 12 Months 5.4
- **Activity Limitation***: Baseline 4.7, 6 Months 5.7, 12 Months 5.8
- **Emotional Function***: Baseline 4.4, 6 Months 5.5, 12 Months 5.8
- **Overall Score***: Baseline 4.3, 6 Months 5.3, 12 Months 5.6

Statistically significant difference found (p<0.05) using Wilcoxon signed-rank non-parametric test.
Summary

- Statistical improvements for current enrollees in:
  - Health resource utilization
  - Symptom frequency
  - Quality of Life indicators at 6M and 12M (adults and caregivers)

- Cost savings

- Value proposition:
  - Significant opportunity to improve process measures around recruitment and retention through increased collaboration and navigating barriers.
Recommendations

• Find a program champion

• Establish program structure as well as clear program processes

• Build in process and performance measures for impact evaluation:
  – Participant Experience
  – Disease/Health Marker
  – Cost

• Leverage the interdisciplinary team and power of CHW relationships

• Don’t give up!
Contact Information

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Vice President, Population Health & Quality
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Panel: Pilot Programs and Perspective on Sustainable Asthma Management Models

OPEN DISCUSSION
Amanda Reddy, Moderator
BREAK
Small Group Discussions

Future Directions and Priorities
Open Discussion

Reflections on the Day

Closing Remarks