Reducing Racial and Ethnic Asthma Disparities among Children in Eastern N.C. (An Intervention Pilot Project)

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REACH QI Symposium
Greenville, NC
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Problem

ED: Count of Asthma (keyword) Grouped by Date
Total Count: 54262
Date Range: 01/01/2008 - 12/31/2008
Region: PHRST 1, PHRST 2, PHRST 3, PHRST 4, PHRST 5, PHRST 6, PHRST 7
Source: NC DETECT; Generated: 11/12/2012
ED: Count Of Asthma (keyword) Grouped by Week

Total Count: 923
Date Range: 01/01/2007 - 12/31/2007
Hospital: Albemarle, Beaufort, Bertie, Chowan, Duplin, Edgecombe, Outer Banks, Pungo, Roanoke Chowan, VMC
Source: NC DETECT; Generated: 11/13/2012

Week Ending Date
- Elementary School (5 - 9)
- Middle Aged (45 - 64)
# Pitt County Elementary Schools

## % Children with Asthma

<table>
<thead>
<tr>
<th>School Name</th>
<th>Severe Allergy</th>
<th>Asthma</th>
<th>Students</th>
<th>% of Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>AYDEN ELEMENTARY</td>
<td>9</td>
<td>84</td>
<td>683</td>
<td>12%</td>
</tr>
<tr>
<td>BELVOIR ELEMENTARY</td>
<td>7</td>
<td>46</td>
<td>576</td>
<td>8%</td>
</tr>
<tr>
<td>CREEKSIDE ELEMENTARY</td>
<td>24</td>
<td>74</td>
<td>588</td>
<td>13%</td>
</tr>
<tr>
<td>EASTERN ELEMENTARY</td>
<td>21</td>
<td>51</td>
<td>633</td>
<td>8%</td>
</tr>
<tr>
<td>ELMHURST ELEMENTARY</td>
<td>12</td>
<td>48</td>
<td>383</td>
<td>13%</td>
</tr>
<tr>
<td>FALKLAND ELEMENTARY</td>
<td>15</td>
<td>52</td>
<td>474</td>
<td>11%</td>
</tr>
<tr>
<td>H B SUGG ELEMENTARY</td>
<td>9</td>
<td>44</td>
<td>425</td>
<td>10%</td>
</tr>
<tr>
<td>LAKEFOREST ELEMENTARY</td>
<td>13</td>
<td>86</td>
<td>770</td>
<td>11%</td>
</tr>
<tr>
<td>NORTHWEST ELEMENTARY</td>
<td>5</td>
<td>65</td>
<td>348</td>
<td>19%</td>
</tr>
<tr>
<td>RIDGEWOOD ELEMENTARY</td>
<td>12</td>
<td>79</td>
<td>694</td>
<td>11%</td>
</tr>
<tr>
<td>SADIE SAULTER ELEM.</td>
<td>4</td>
<td>30</td>
<td>150</td>
<td>20%</td>
</tr>
<tr>
<td>SAM D BUNDY ELEM.</td>
<td>12</td>
<td>56</td>
<td>408</td>
<td>14%</td>
</tr>
<tr>
<td>SOUTH GREENVILLE ELEM.</td>
<td>18</td>
<td>73</td>
<td>483</td>
<td>15%</td>
</tr>
<tr>
<td>WAHL COATES ELEM.</td>
<td>9</td>
<td>57</td>
<td>464</td>
<td>12%</td>
</tr>
<tr>
<td>WH ROBINSON ELEM.</td>
<td>9</td>
<td>67</td>
<td>549</td>
<td>12%</td>
</tr>
<tr>
<td>WINTERGREEN INTERMED</td>
<td>18</td>
<td>60</td>
<td>714</td>
<td>8%</td>
</tr>
<tr>
<td>WINTERGREEN PRIMARY</td>
<td>15</td>
<td>44</td>
<td>657</td>
<td>7%</td>
</tr>
</tbody>
</table>
Problem
• Asthma disproportionately impacts poor, young, minority children

Gap
• Poor Asthma Control
• Frequent Use of Emergency Department (ED)
• Missed School Days
• Home exposure to environmental asthma triggers

Target Population
• Low income, high risk children (5-17 years of age)

Proposed Solution
• Conduct an Environmental Intervention Pilot Project – Eastern Carolina Asthma Prevention Program (ECAPP)
Collaborative Team

**Vidant Pediatric Asthma Program**
Lisa Johnson, Respiratory Therapist
Theresa Blount, Registered Nurse
Jenny Sharpe, Social Worker

**ECU, BSOM, Department of Public Health**
Dr. Greg Kearney, Asst. Professor, Environmental Epidemiologist
Landon Allen, Kaniqua Outlaw, Kevin Lamm, Landon Allen, Matthew Prentice, Linda Wei – MD/MPH and MPH students

ECU + Vidant Peds + $[x]$ = Eastern Carolina Asthma Prevention Program (ECAPP)
Evidence-based literature on asthma and home environment

*Home-based interventions that use a multi-faceted approach to help residents decrease exposure to multiple asthma triggers are effective in reducing exposure to triggers, decreasing asthma symptoms and short-term health care use, and improving quality of life.*

AIMS: ECAPP

Reduce asthma respiratory symptoms, ED visits and airway inflammation among, low income, high risk children (5-17 years of age) living in rural areas of eastern NC.
Intervention vs Control Group (N=19)

**Intervention Group (n=12)**

- Intense asthma education
- Home visits (3)
- 2 week follow up calls and breathing tests (3)
- Environmental intervention products and environmental consult assessment (3x)

**Control Group (n=7)**

- Initial asthma education
- Home visits (3)
- 2 week follow up calls and breathing tests (3)
- **Did not receive** environmental products, consult assessment or extra asthma education*

*(Both groups followed for 6 months)*
QI Measures used to assess the effectiveness of our Home-Based Intervention

1. Increase/Decrease of Asthma Severity

2. Increase/Decrease Respiratory Breathing Tests

3. Identifying Environmental “Triggers” in home
1. Asthma Severity (mild, moderate or severe)*

Questions included:

• *During the past 2 weeks, how many asthma symptoms (wheezing, cough, waking up at night)....?

• *During the past 2 weeks about how many days did [child] use rescue and/or controller medicine?

• *During last 6 months did [child] have unscheduled ED or clinic visits?

2. Respiratory Tests

- PFT – spirometry; above or below percent predicted

- Airway Inflammation – Fractional exhaled Nitric Oxide (eNO) ppb
3. Environmental “Triggers” Assessment

- Temperature and Humidity
- Visual evidence of environment “triggers”
  - mice, cockroaches, household chemicals, fragrances, mold, moisture, pets, smoking, stuffed animals, dirty carpet
- Evaluation of HVA/C system
Intervention Group:
Received “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-
  Furniture, Floor and damp cloth mop
• Non-odor pesticides baits
• Non-toxic rodent baits*
• Food storage containers

*In some cases commercial services were used
Intervention:
Personalized Instructions, Education and Demonstrations on Using Products
Intervention:
Instructions, Education and Demonstrations on Proper Use of Spacers/Inhalers and Medication
Intervention Results: Decrease in Airway Inflammation

Figure 1. Geometric mean of FeNO among intervention and control groups over 6 months study period
Intervention Results:
Decrease in Asthma-related of ED visits

• Overall, 33% increase in the number of asthma-related ED visits were identified in the control group and a 75% decrease in asthma-related ED visits among the intervention study group.
Intervention Results:
Decrease in Symptoms, Rescue & Increase in Controller Meds

- Intervention Group:
  - Baseline: 50
  - Exit: 150

- Control Group:
  - Baseline: 0
  - Exit: 200

Categories:
- Respiratory Symptoms
- Rescue Medicine
- Controller Medicine
QI Impact

• Significantly reduced self-reported asthma respiratory symptoms
• Reduced Number of ED visits, levels of airway inflammation
• Improved respiratory health outcomes for children
• Improved communications with child’s physician

• **Reduced cost savings** –

• Our cost $550-$600 per family for 3 scheduled home visits (included all products);
• Avg ED visit costs = $691 and In-patient stay = $7,987*
• Contributes to less financial and emotional burden on child and family

Challenges

• Scheduling of home visits
• Smoking in the 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
• Screening families for enrollment
• Length of baseline interview
Next Steps

• Case study for demonstrating cost reimbursement by Medicaid
• Expansion of ECAPP throughout ENC
• Create Eastern Carolina Asthma Consortium

ECU + Vidant Peds + [Community Partners] = ECAPP
Eastern Carolina Asthma Prevention Program (ECAPP): An Environmental Intervention Study Among Rural and Underserved Children with Asthma in Eastern North Carolina

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NC DHHS
Asthma Alliance of NC
References


3. American Lung Association, Trends in Asthma Morbidity and Mortality. Epidemiology and Statistical Unit, Research and Health Education Division, 2012


