



Reducing Environmental Exposures for Patients with Asthma

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

Prevalence of asthma Children



- **Besides dental disease, asthma is the most common chronic disease of childhood**
- **Highest prevalence rates are seen in children 5-17 years**
- **Ever prevalence (2010)**
 - US – 14% (8.5 million)
 - NC – 16.5%
- **Current prevalence (2010)**
 - US – 10% (7.1 million)
 - NC – 10.2%

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

Prevalence of asthma Adults



- **Lifetime Prevalence (2009)**
 - US – 13.4% (31.4 million)
 - NC – 12.9% (908,462)

- **Current Prevalence**
 - US – 8.4% (17.5 million)
 - NC – 7.8% (547,197)

Annual Impact of Asthma-US



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- ~ 1/2 million hospital discharges
- 3 million hospital outpatient or emergency department visits
- 10 million physician office visits
- **\$56.0 billion economic cost in the U.S.**
 - \$50.1 billion direct health care
 - \$5.9 billion indirect costs (lost productivity)
- **Leading cause of missed days of school in NC**

Asthma and Environmental Exposures



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- While asthma has a multi-factorial etiology, environmental exposures are recognized as significant triggers of asthma exacerbations.
- Indoor environmental exposures (e.g. mold, dust mites)
- Outdoor environmental exposures (e.g. ozone, pollen, air particulate)

Why add the Environmental Assessment Piece?



- New evidence strengthened 2007 NIH recommendations
 - Reducing exposure to inhalant indoor allergens can improve asthma control
 - A multi-faceted approach is required
- Exposure to allergens (Evidence A) or irritants (EPR-2 1997) to which patients are sensitive increases asthma symptoms and exacerbations
- Clinicians should evaluate the potential role of allergens, particularly indoor inhalant allergens (Evidence A), in patients with persistent asthma
- Patients who have asthma at any level of severity should reduce exposure to allergens to which the patient is sensitized

The Guide to Community Preventive Services – 2008



- **Community Preventive Services Task Force recommends the use of home-based, multi-trigger, multi-component interventions with an environmental focus for children and adolescents with asthma**
 - Trained personnel making ≥ 1 home visit
 - Focus on reducing exposures to > 1 asthma triggers in the home through environmental assessment, education, and remediation.
 - Most programs include additional components, such as self-management training, social support, and coordinated care
- **Strong evidence of effectiveness in reducing symptom days, improving quality of life or symptom scores, and in reducing the number of school days missed.**
- <http://www.thecommunityguide.org/asthma/index.html>

Cochrane Report on House Dust Mite Control – 2010



- **Single interventions ineffective**
- **Specifically assessed the effects of reducing exposure to house dust mite antigens in the homes of people with mite-sensitive asthma.**
- **54 trials - 36 assessed physical methods (26 mattress encasings), 10 chemical methods, 8 combination of chemical and physical methods.**
- **No effect on clinical outcomes (e.g. peak flows, asthma sxs, med use)**
- **Did recognize that mite-sensitive asthmatic patients are often (>50%) sensitive to other allergens, so that successful elimination of only one allergen may have limited benefit**
- **Did not included multi-component studies in review, but did comment on 2**
 - Large trial of multiple interventions that reported positive effects on clinically relevant outcomes (i.e. number of days with symptoms, night awakenings and missed school days) – had study design limitations
 - A meta-analysis that compared multifaceted with monofaceted interventions for preventing the development of asthma in newborns suggested that multifaceted interventions might be more effective – but some study limitations

American Journal of Preventive Medicine - 2011



-
- Effectiveness of Home-Based, Multi-Trigger, Multicomponent Interventions with an Environmental Focus for Reducing Asthma Morbidity
 - 23 studies met intervention and quality criteria for inclusion in the final analysis.
 - Noted the limitation of reducing exposure to house dust mite alone on improving asthma symptoms and reducing medication usage.
 - Conclusions: Home-based, multi-trigger, multicomponent interventions with an environmental focus are effective in improving overall quality of life and productivity in children and adolescents with asthma. The effectiveness of these interventions in adults is inconclusive due to the small number of studies and inconsistent results.

(Am J Prev Med 2011;41(2S1):S5–S32)



Who is most vulnerable?

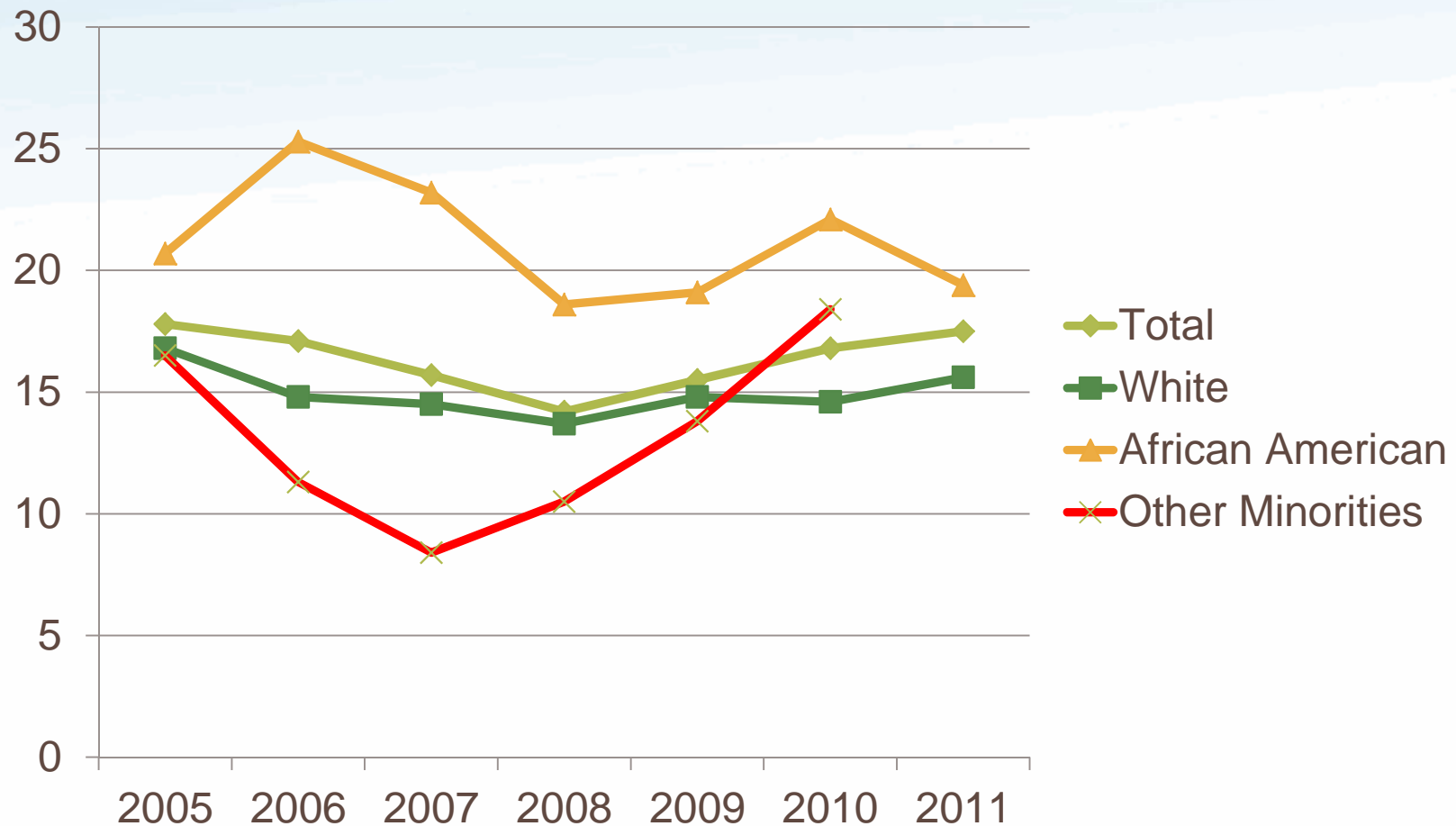


% of NC Children <18 yrs Who Have "Ever Had" Asthma by Race/Ethnicity

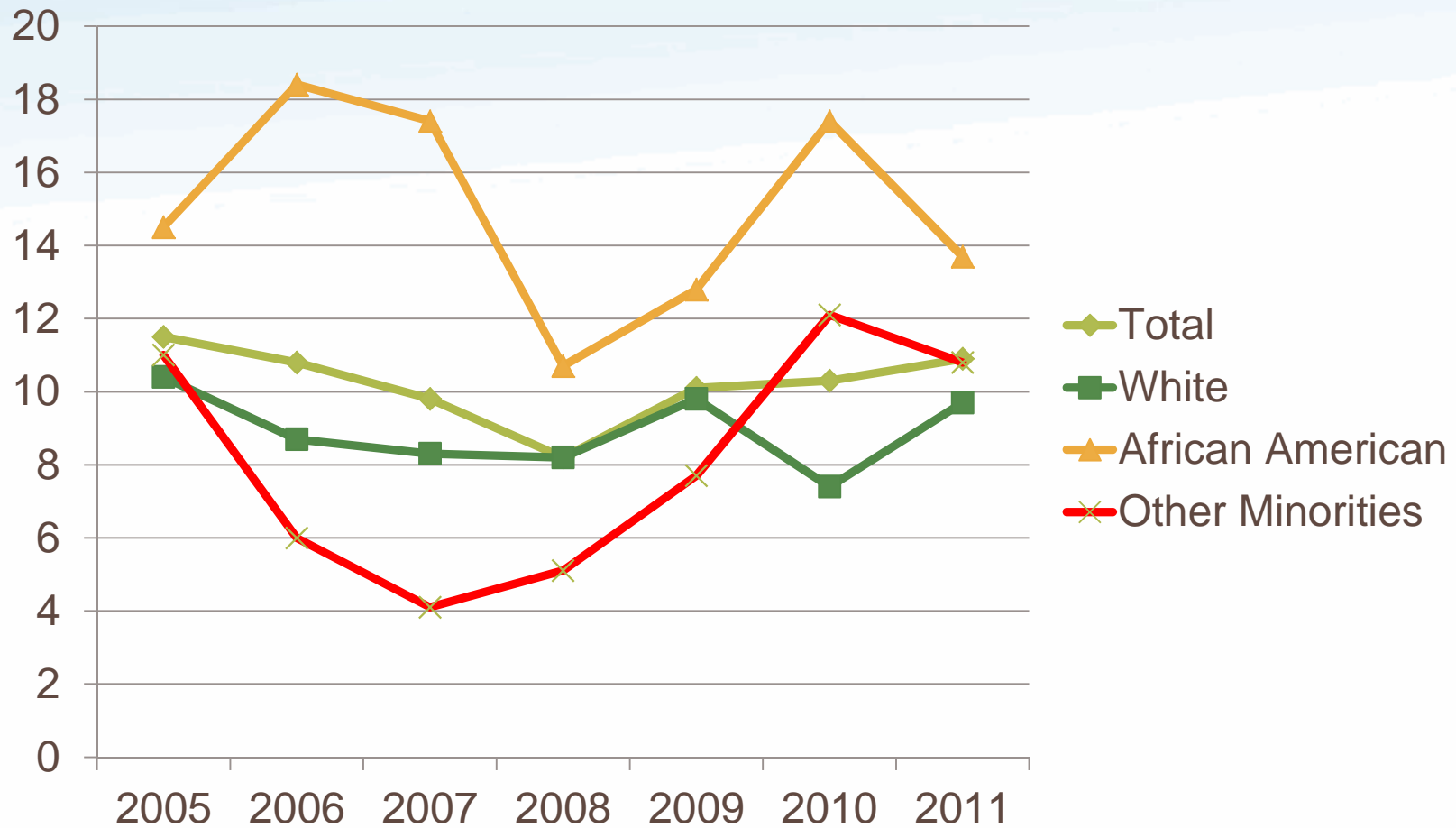


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% of NC Children Who “Currently Have” Asthma by Race/Ethnicity

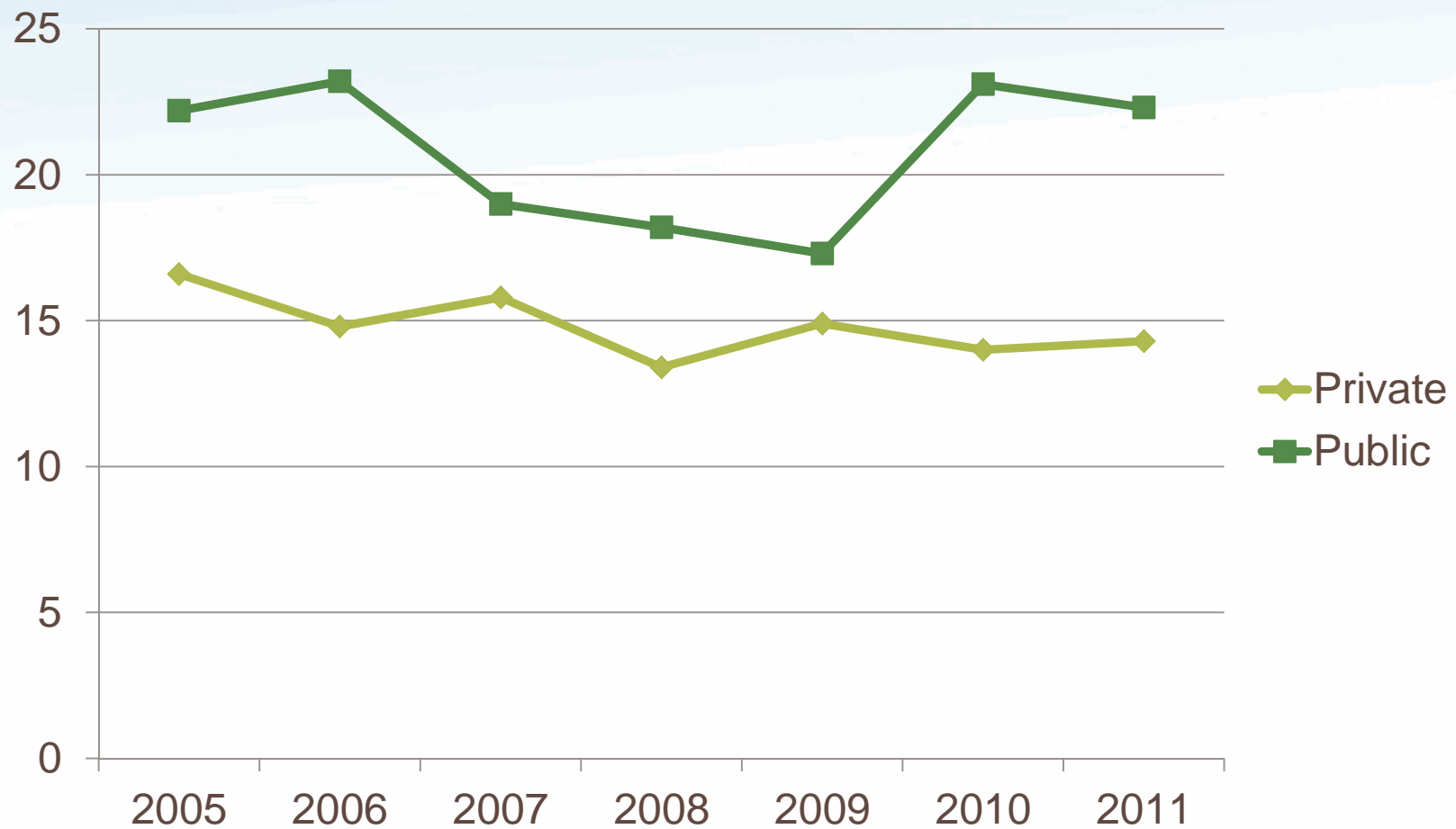


% of NC Children <18 yrs Who Have "Ever Had" Asthma by Insurance Status

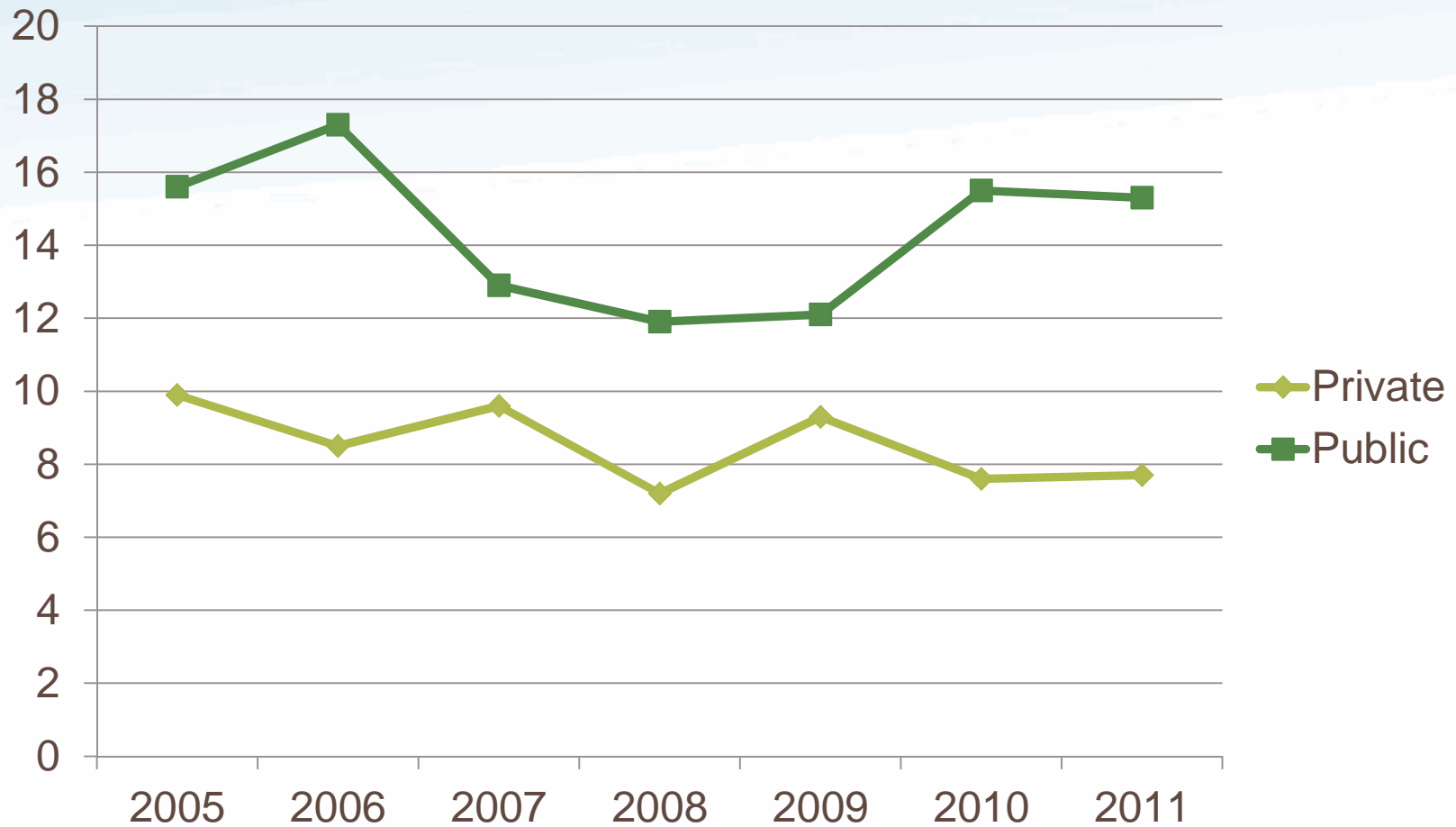


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% of NC Children Who “Currently Have” Asthma by Insurance Status



Disparity by housing



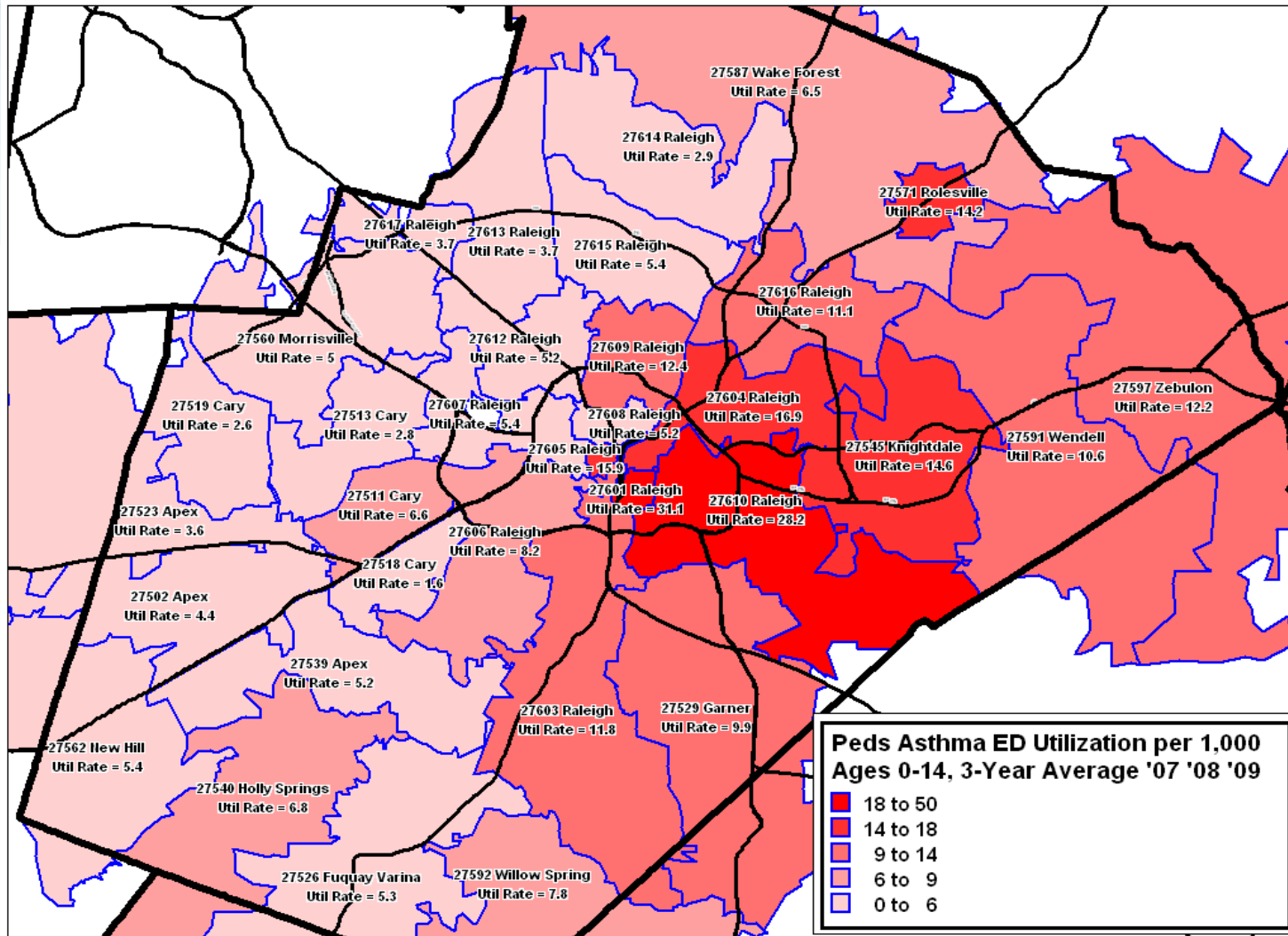
- Poor housing quality strongly associated with poor asthma control even after controlling for confounders such as income, overcrowding, smoking, unemployment *Am J Prev Med* 2011;41(2S1)
- Perhaps some of the disparity is due to differential exposure to environmental triggers from low-income housing
- Further exacerbated by vulnerability of families in rental housing to make changes

Asthma related ED visits/1,000 Ages 0-14 yrs by Wake County Zip Codes



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Community Care of NC



-
- Statewide primary care medical home & care management system for Carolina Access Medicaid and other populations
 - Established to improve access to, quality of and coordination of care and decrease cost of care
 - Quality driven, system oriented
 - Community based, locally driven, provider led
 - Utilizes population level and individual level management strategies
 - Provides ready access to data

Local Networks



- 14 local Networks across all 100 NC counties with more than 4500 Primary Care Physicians (1360 medical homes)
- Over 1.4 million Medicaid enrollees, including dual Medicare/Medicaid and Health Choice enrollees

Local Networks



- Provide resources to primary care homes to better manage Medicaid population
- Join public and private sector primary care homes with other segments of the health care system (e.g. hospitals, health departments, mental health agencies, social services) to create local systems of care
- Utilize local multi-disciplinary care managers, pharmacists, psychiatrists and medical directors
- Pilot potential solutions, monitor implementation, share best practices
- Are capable of and accountable for managing recipient care



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- AccessCare Network Sites
- AccessCare Network Counties
- Community Care of Western North Carolina
- Community Care of the Lower Cape Fear
- Carolina Collaborative Community Care
- Community Care of Wake and Johnston Counties
- Community Care Partners of Greater Mecklenburg
- Carolina Community Health Partnership

Legend

- Community Care Plan of Eastern Carolina
- Community Health Partners
- Northern Piedmont Community Care
- Northwest Community Care
- Partnership for Health Management
- Community Care of the Sandhills
- Community Care of Southern Piedmont

Source: CCNC 2011

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**
- **120, 000 recipients**
- **149 Primary Care Medical Homes**



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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**

Environmental Assessments



- **Informed from pilot work in '06-'07**
- **Initiated August 2008**
- **Partnered with Wake County Human Services and Wake County Environment Services - 0.5 FTE position dedicated to the project.**
- **Multi-disciplinary, multi-component home visits and follow ups**
- **Database implemented that tracks costs and interventions - 1 year prior 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**
- **Intense focus is 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 Patient List (PPL)**

- **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 Case Managers provide general asthma education on medications, triggers and control**
- **Environmental Specialist inspects home for possible triggers and provides education**
- **Mattress and pillow encasings are provided**
- **RN and Environmental Specialist work to determine any other environmental needs (roach containment, HEPA vacuum, dehumidifier, etc.)**

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.**

Patient Education




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CHEMICAL IRRITANTS



Chemical irritants found in some scented and unscented products in your house, 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*
 - *sawdust smoke*
 - *strong perfumes*
 - *body powder*



CCWJCC 3/2009

Done Unknown Zone

Patient Education



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Toxic-Free Pest Control from your Pantry

A fact sheet from Toxic Free NC

Toxic Free NC common sense pest control recipe

Roach Balls




1 cup borax
1/4 cup sugar
1/4 cup minced 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
1/2 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 mildew is still visible, repeat application. Do not save the leftover mixture.

Toxic Free NC common sense pest control recipe

Herbal Insect Repellent



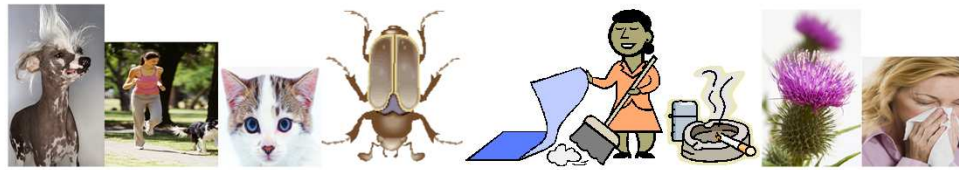
15 drops lavender oil
15 drops tea tree oil
10 drops citronella oil
10 drops eucalyptus oil
10 drops cedarwood oil

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

Done Unknown Zone

Asthma Triggers



| Trigger | Notes | Suggestions |
|---|--|---|
| Respiratory infections | Colds and flu are the most common trigger for asthma, especially in children. | <ul style="list-style-type: none"> • Get an annual flu vaccination • Wash hands frequently |
| Exercise | Exercise can be an asthma trigger, but to stay healthy don't avoid it. | <ul style="list-style-type: none"> • Take quick relief medicine right before exercise • Warm up before exercise |
| Emotions | Emotions like laughing, crying or stress can cause symptoms. | <ul style="list-style-type: none"> • Take slow deep breaths in and out through nose until calm |
| Smoke (tobacco or wood) | Smoke irritates the airways and causes asthma symptoms. | <ul style="list-style-type: none"> • Do not smoke • Do not allow smoking in car or home. • Smoke can linger on clothes and trigger asthma • Avoid wood-burning stoves |
| Chemicals and fumes | Chemicals in scented and unscented household products, like cleaners, paints, air fresheners, and candles can make your child's asthma worse | <ul style="list-style-type: none"> • Decrease use of these products and try to use only when child not present • Open windows and doors to ventilate and use a fan |
| Dust Mites | Dust mites are tiny insects too small to see. They live in mattresses, carpets, furniture, linens, and stuffed animals. | <ul style="list-style-type: none"> • Use mattress and pillow covers that block mites • Wash linens and clothing in hot water • Using a HEPA filter vacuum may reduce trigger exposure • Remove stuffed animals from bedrooms |
| Pests <ul style="list-style-type: none"> • Cockroaches • Rats, mice | Small pieces of dead roaches and roach droppings settle in household dust and can end up in the air we breathe. | <ul style="list-style-type: none"> • Do not leave food or garbage out • Use poison baits like roach gel or boric acid • Clean up cluttered areas where roaches like to hide • Fix plumbing leaks so pests won't have a place to drink |
| Mold | Molds release spores into the air that can trigger asthma. | <ul style="list-style-type: none"> • Use fan or open window when cooking or showering • Clean small amounts of mold with bleach and water • Fix plumbing leaks within 48 hours • Seek professional help if leak is larger than 3x3 |
| Pets | Animal dander from pet urine, skin and saliva can trigger asthma. | <ul style="list-style-type: none"> • Consider not having pets if allergic to them • Keep pets out of the bedroom • Wash pets weekly |



Air Quality Color Guide

| Air Quality Index | Guidelines to protect your health | Care for the air |
|--|---|--|
| Good 0-50 <i>Code Green</i> | No health effects expected. | <ul style="list-style-type: none"> ■ Conserve energy: drive less and use less electricity. ■ Carpool, use public transportation, bike or walk whenever possible. ■ Keep your car, boat, lawnmower and other engines tuned and maintained. ■ Keep tires properly inflated and wheels aligned. ■ Never burn your trash. This is illegal and releases toxic chemicals. Avoid burning leaves and brush, which is sometimes legal but always pollutes the air. |
| Moderate 51-100 <i>Code Yellow</i> | Unusually sensitive people: consider limiting prolonged or heavy exertion. | |
| Unhealthy for Sensitive Groups 101-150 <i>Code Orange</i> | Children, active people, older adults, and those with heart or lung disease (like asthma): limit prolonged or heavy exertion. | |
| Unhealthy 151-200 <i>Code Red</i> | Children, active people, older adults, and those with heart or lung disease (like asthma): avoid prolonged or heavy exertion. Everyone else: limit prolonged or heavy exertion. | |
| Very Unhealthy 201-300 <i>Code Purple</i> | Everyone: avoid all exertion. | |

The daily air quality forecast covers two common air pollutants:

Ground-level ozone forms when pollutants from cars, power plants and other sources combine in hot sunlight. Ozone is a lung irritant that causes shortness of breath, irritates throats and eyes, and aggravates asthma. Ozone levels are highest outdoors from early afternoon to early evening on hot, sunny days.

Particle pollution is a mixture of very small solids and liquids suspended in air. These tiny particles can reach deep into the lungs, where they can aggravate asthma and other lung conditions, and even cause heart problems. Particle pollution can be high at any time of day or night, and any time of year. High particle levels often are caused by forest fires or residential wood burning, especially when weather conditions causes pollution to stay close to the ground.

The daily forecast always tells you which pollutant is of greatest concern.

Air Quality Forecasts and Information: www.ncair.org / 1-888-RU4NCAIR (1-888-784-6224)

30,000 copies of this public document were printed on recycled paper at a cost of \$2,287.30 or \$ 0.076 per copy. June 2009.

Post Assessment Reports



- **A detailed report is provided to parent**
- **A Detailed Report Is Provided To PCP That Includes:**
 - **Findings Of Assessment**
 - **Education And Supplies Provided**
 - **Recommendations Made By Environmental Services**
 - **Medication Reconciliation**
- **With family permission and if applicable, a letter and copy of report is provided to landlords**
- **Contact information for agencies that can advocate for or represent families is given, if property owners will not repair facility issues.**

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

Follow Up



- **A repeat home visit by RN Case Manager at 6 weeks**
 - **Assess compliance with recommendations**
 - **Give recommended supplies (e.g. Hepa Vacuum, food containers, etc)**

- **Home Visit by RN Case Manager at 1 year for Asthma Assessment (including adherence to environmental recommendations)**

Total Program Savings to Date- \$185, 525

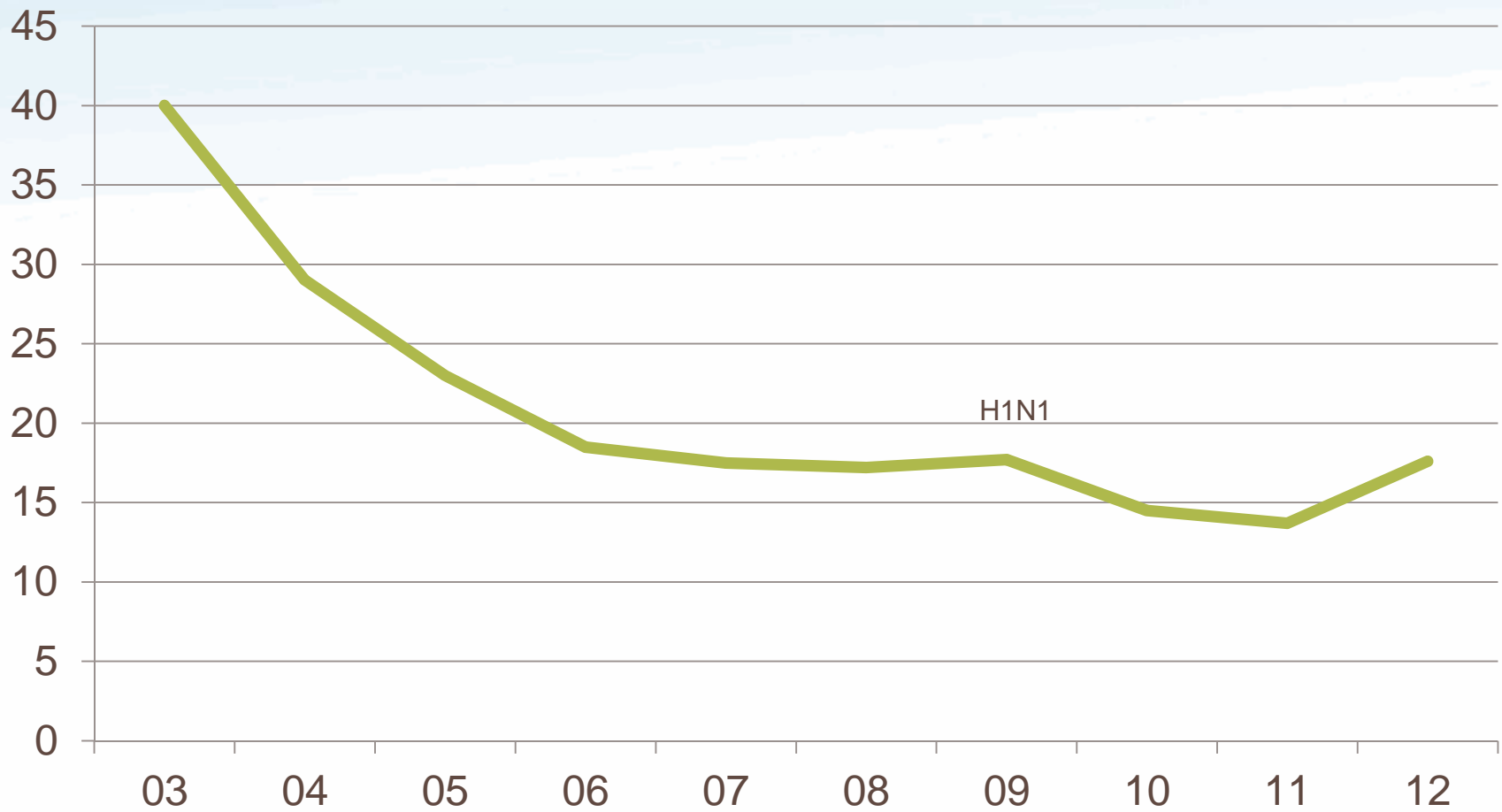
Average Savings per Patient - \$707



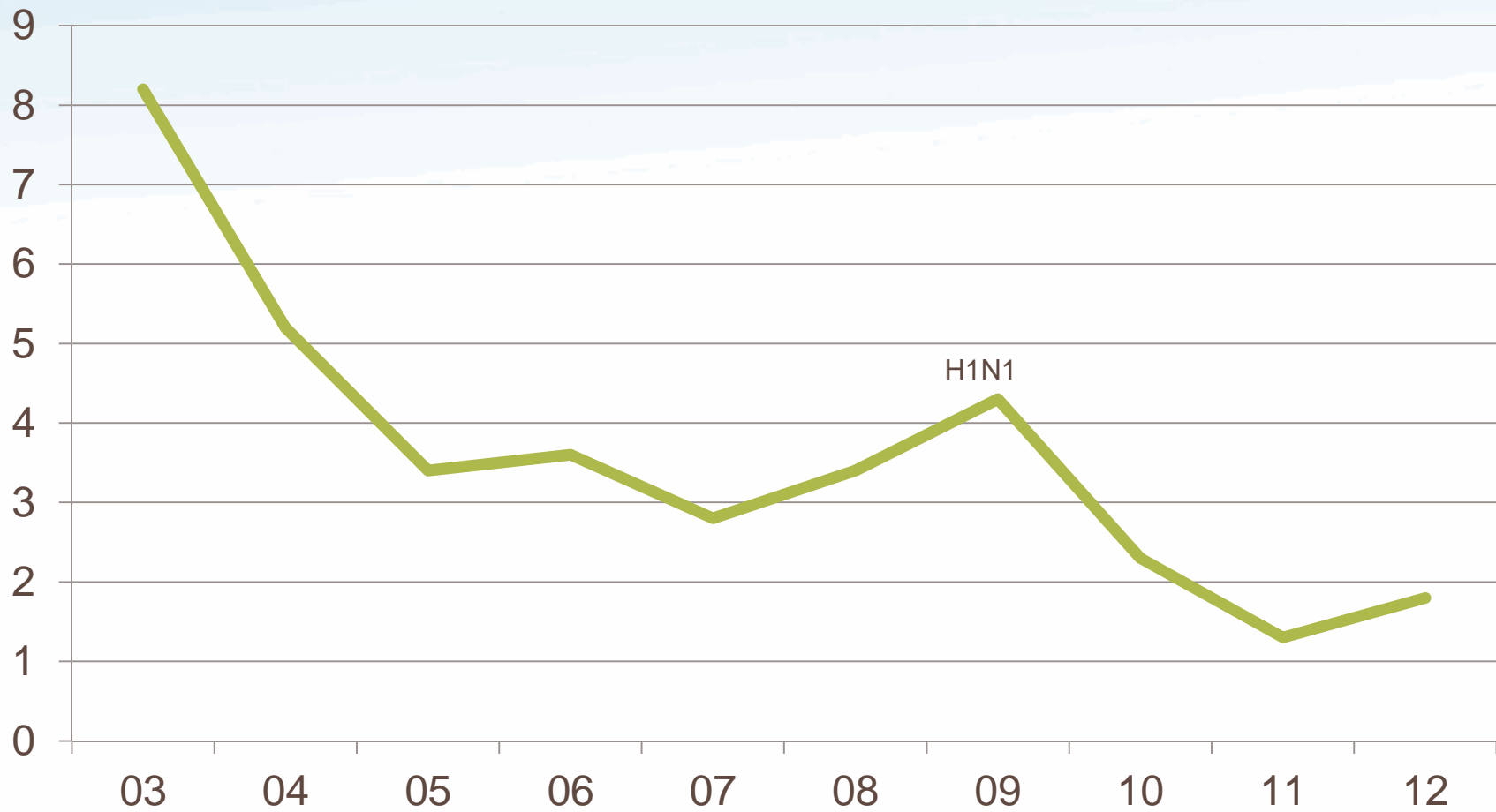
Asthma Environmental Survey Data 3/2013

| Trigger Report (112 of 450) | | | Cost Report (258 Of 450) | | | |
|--|-----|------------|-----------------------------|-----------|----------------------------|--------|
| Trigger | # | Avg per pt | Pre-intervention | | | |
| Total triggers identified | 427 | 3.8 | Total DME costs | \$18,308 | Avg DME cost/patient | \$71 |
| Triggers under family control | 330 | 2.9 | Total pharmacy costs | \$241,462 | Avg pharmacy cost/patient | \$936 |
| Triggers requiring outside (landlord) intervention | 138 | 1.2 | Total visit costs | \$392,638 | Avg visit cost/patient | \$1522 |
| | | | Total costs | \$651,413 | Avg total cost/patient | \$2529 |
| | | | Post intervention | | | |
| Family triggers changed at 6 wks | 217 | 1.9 | Total DME costs | \$10,461 | Avg DME cost/patient | \$41 |
| Landlord triggers changed at 6 wks | 26 | .23 | Total pharmacy costs | \$293,494 | Avg pharmacy cost/patient | \$1138 |
| | | | Total Visit cost | \$165,888 | Avg visit cost/patient | \$643 |
| Family triggers changed at 1 year | 124 | 1.1 | Total costs | | | |
| Landlord triggers changed at 1 year | 22 | .19 | | | | |
| | | | Total costs | \$465,888 | Avg total cost/per patient | \$1822 |

Asthma ED rates - CCWJC



Asthma Hospitalization rates - CCWJC





Other activities around the state



Community Care Partners/ Northern Piedmont CC (Vance, Warren, Franklin, Person, Granville)



- Challenges - Poor housing standard housing for low income populations, no minimum housing code, limited resources for health departments, lack of funding to address issues
- Healthier Homes/Asthma Initiative – 18 months ago
- Care managers identify pediatric patients with poorly controlled asthma (ED/Inpatient alerts, PCP referrals)
- Healthier Homes Coordinator provides
 - An in depth home assessment using the Healthy Homes Assessment tool.
 - Patient education on asthma triggers and other health & safety issues
 - Corrective Action Task List
 - Assessment of financial ability to address issues
- Community and network resources leveraged to achieve needed improvements (e.g. portable window fans, pillow/bed covers, filters, HEPA vac, trash cans w/lids)
- Advocacy role with local and state agencies, faith based groups as well as individual landlords and low income housing assistance programs to address identified issues.

Northwest Community Care

(Wilkes, Surry, Yadkin, Davie, Stokes, Forsyth,
~Davidson)



- Children with asthma-related ED visits referred to Davidson County Health Department
- Home visit assessing triggers and suggestions for reducing exposure to those triggers

Alamance County HD/Healthy Alamance Child Asthma Coalition



Outdoor Environmental Triggers

- Air Quality flag placed throughout Alamance County schools
- Air Quality Magnets placed on all Environmental Health cars and trucks
- Anti-Idling signs at all public schools in Alamance County
- Air Quality Index Toolkit for teachers at all schools media centers

Indoor Environmental Triggers

- Healthy Homes Program
- Home visit by Registered Environmental Health Specialist
- Assess triggers and provide education on ways to lower risk
- Demonstrate and provide a bucket kit containing asthma-friendly mattress covers, cleaning tools, and supplies or loan a HEPA filter vacuum.

Community Care of Lower Cape Fear

(Bladen, Columbus, Brunswick, Pender,
New Hanover, Onslow)



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Community Care of Wake/Johnston Counties

- Recent work to improve asthma education and simplify approaches to triggers and treatment.
- Working with New Hanover Regional Medical Center to have similar asthma education
- Scheduling home visits at bed side of hospitalized children with asthma
- Giving out pillow covers at asthma home visits
- UNC Healthy Homes training in May for Care Managers and staff from New Hanover Regional Medical Center

Carolina Community Health Partnership

(Rutherford and Cleveland Counties)



- **Partners with the Cleveland County Health Department**
- **Participates in the Asthma Coalition and the County Alliance for Health**
- **Patient education and community outreach and education**
- **Air Quality Flags are located in different areas of the county and posted on the website, and changed according to the Department of Environment**

Community Care of Western North Carolina



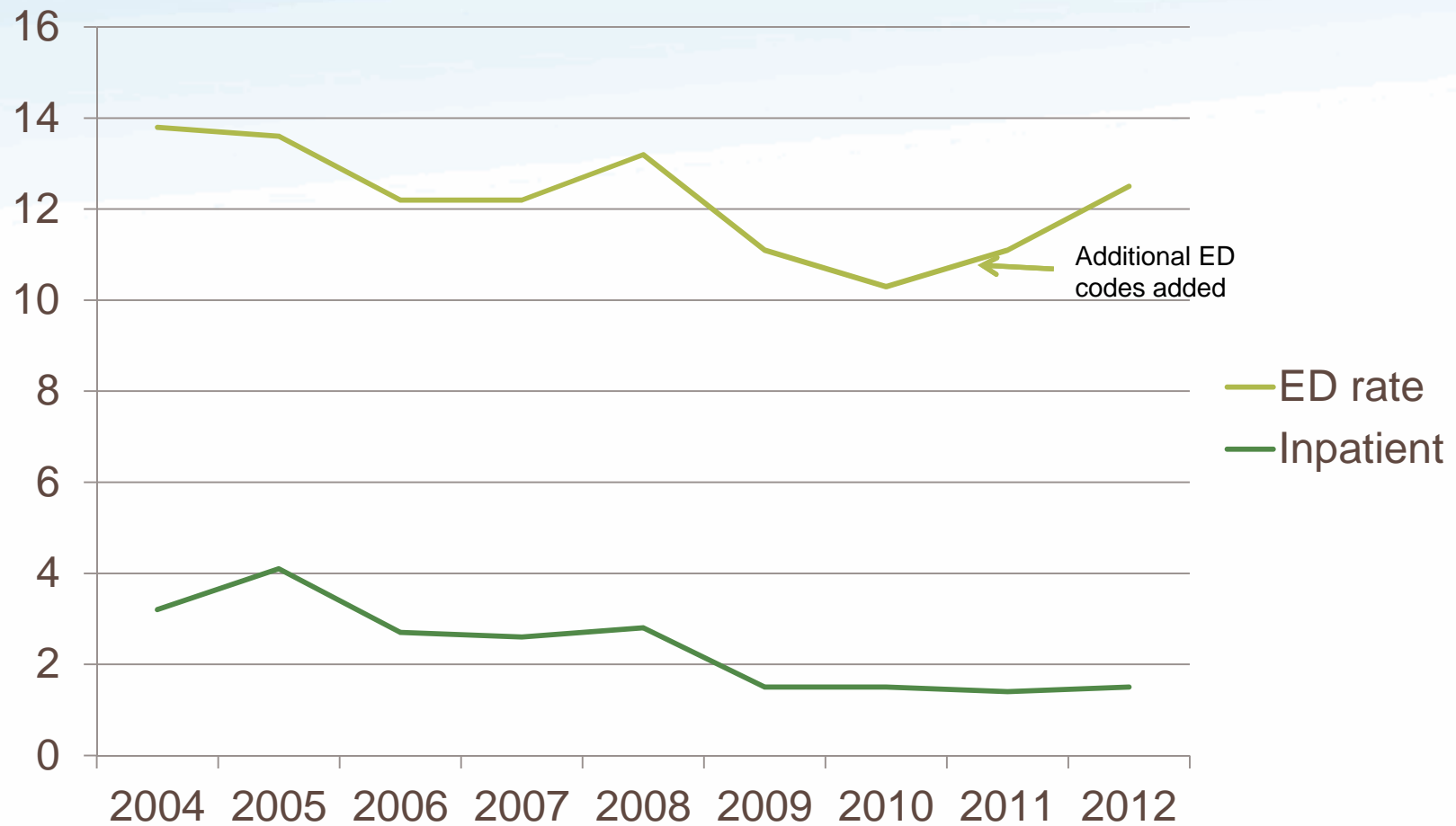
- **Pediatric care collaborative with providers that focuses on asthma and childhood obesity.**
- **Focus on the 6 priority messages from the National Asthma Education and Prevention Program (NAEPP) Guidelines Implementation Panel (GIP) Report 2008:**
 - **1. Assess Asthma Severity**
 - **2. Use Inhaled Corticosteroids**
 - **3. Use Asthma Action Plans**
 - **4. Assess Asthma Control**
 - **5. Schedule Follow up Visits**
 - **6. Control Environmental Exposures**
 - Allergens and irritants to which the patients is sensitive and exposed (e.g., indoor inhalant allergens (A), tobacco smoke and other irritants (C))
 - Consider allergen immunotherapy when there is clear evidence of a relationship between symptoms and exposure to an allergen to which the patient is sensitive

Asthma ED and Hospitalization rates per 1000MM



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Community Care of Wake/Johnston Counties



Statewide Smoke-Free Multi-Unit Housing Efforts



- **NC Division of Public Health received a five-year Community Transformation Grant from CDC**
- **One of the CTG strategy areas: to increase the number of multi-unit housing properties with smoke-free policies**
- **CTG grantees and Tobacco Prevention and Control Branch grantees covering all counties of the state are promoting smoke-free policies in multi-unit housing**
 - Created smoke-free housing website, www.smokefreehousingnc.com
 - Holding lunch 'n' learns around the state for property managers to hear from others who have passed smoke-free policies
 - Providing cessation resources for tenants

Medical-Legal Partnership Program of Legal Aid of NC



- **Durham, Charlotte, Winston-Salem, Greensboro, Chapel Hill, and Prospect Hill**
- **Physicians, nurses, social workers, attorneys, paralegals, and others to address the social and environmental determinants of health, including:**
 - Substandard housing conditions;
 - Domestic violence;
 - Food, income, and housing insecurity; and
 - Improper denials of public benefits.
- **Opportunity to focus on environmental triggers in rental housing through legal advocacy with landlords**
- **Madlyn Morreale, JD, MPH madlynm@legalaidnc.org**

In Summary



- **Reducing environmental exposures and triggers are an important aspect of comprehensive asthma management**
- **Good evidence to support the effectiveness of multi-component approach to trigger reduction**
- **Good momentum and activity going on in pockets of the state**
- **Lots of room and opportunities to expand activities**



Thank you!

Questions?

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919-792-3621

