Environmental Asthma Triggers and Active Asthma by Socioeconomic Status Among Children in Texas, 2006-2010

2013 CSTE Conference, Pasadena, CA
June 10th, 2013

Erin Wickerham, MPH
Texas Asthma Control Program
Office of Surveillance, Evaluation, and Research
Health Promotion and Chronic Disease Prevention Section
Texas Department of State Health Services
• Background
• Objective
• Methods
• Results
• Summary
• Limitations
• Next steps
• Asthma is a chronic disease

• Asthma triggers – Ex: tobacco smoke, dust mites, outdoor air pollution, mold

• Environmental asthma triggers

• No cure → Disease management through management of asthma triggers
OBJECTIVE

To examine the relationship between active asthma status and exposure to asthma triggers in the home by socioeconomic status (SES) among children in Texas.
METHODS

• Data: 2006-2010 Behavioral Risk Factor Surveillance System Child Asthma Call-Back Survey

• Analysis & Software: Survey-weighted logistic regression using SAS 9.2

• Outcome of interest: Active/inactive asthma status

• Active asthma
  – In the last 12 months any of the following occurred:
    • Adult talked to a doctor or other health care provider about the child’s asthma, or
    • Child took any asthma medication, or
    • Child had any symptoms of asthma without having a cold or respiratory infection
METHODS

• Nine questions about presence of environmental triggers in home categorized into 4 types:
  – 1) Cigarette smoke, 2) mold, 3) Furry/feathered animals 4) Indoor use of wood burning/gas

• Primary exposure variable: Exposure to 0, 1, 2, or 3-4 environmental trigger types

• Socioeconomic status (SES): Household income <$25,000 (low), $25,000-$75,000 (middle), and ≥$75,000 (high)

• Full models were adjusted for child’s age, child’s sex, current flu vaccine, and adult’s race/ethnicity
RESULTS

• Demographics by asthma status

• Home environmental exposures by asthma status

• Adjusted odds ratios for active asthma among low, medium, and high SES by number of home environmental asthma trigger exposures
Demographics by asthma status, ACBS, Texas, 2006-2010

Active Asthma: N = 576 (73.8%)
Non Active Asthma: N = 204 (26.2%)

- **Active Asthma vs. Non Active Asthma**
  - Boy
  - * Non-Hispanic, White
  - Adult Education
  - High school degree or less
  - Some college
  - College or technical degree
  - * Household Income
    - < $25,000
    - $25,000-$75,000
    - ≥ $75,000
  - Health Insurance Coverage
    - * Health Insurance Type
      - Parent’s employer
      - Medicaid, Medicare, or CHIP
      - Other
  - * Flu Vaccine

* Indicates statistically significant Chi Square test (p<0.05)
Home environmental exposures by asthma status, ACBS, Texas, 2006-2010

**Active Asthma**
N = 576 (73.8%)

**Non Active Asthma**
N = 204 (26.2%)

### Prevalence (%)

<table>
<thead>
<tr>
<th>Exposure Variable</th>
<th>Active Asthma</th>
<th>Non Active Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes smoked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mold seen/smelled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Inside pets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Pets allowed in bedroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saw cockroach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saw mice/rat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood burning stove/fireplace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unvented gas logs, stoves or fireplaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas used for cooking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Categorical exposure variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Indicates statistically significant Chi Square test (p<0.05)
RESULTS

Adjusted\(^1\) odds ratios for active asthma among low SES children

\[ \text{Adjusted Odds Ratio (95\% CI)} \]

Number of Environmental Asthma Triggers in Home

\(^1\) Models adjusted for child’s age, child’s sex, current flu vaccine, and adult’s race/ethnicity.
Adjusted¹ odds ratios for active asthma among middle SES children

1. Models adjusted for child’s age, child’s sex, current flu vaccine, and adult’s race/ethnicity.
Adjusted\(^1\) odds ratios for active asthma among high SES children

Adjusted Odds Ratio (95% CI) [log scale]

Number of Environmental Asthma Triggers in Home

\(^1\) Models adjusted for child’s age, child’s sex, current flu vaccine, and adult’s race/ethnicity.
SUMMARY

• 74% of children who had ever been told they have asthma had current asthma.

• Low SES children in Texas exposed to more asthma triggers were less likely to have active asthma (p=0.04).

• Exposure to environmental asthma trigger groups was not associated with active asthma in bivariate analysis.

• Opposite findings of what might be expected?

• Asthma triggers in other settings may be important (Ex: school, day care)
LIMITATIONS

- Temporality of exposure variables is inconsistent

- Temporality of exposure and categorization of active asthma status

- Income variable is missing data → smaller sample size for multivariate analysis

- Not enough information to determine size of environmental exposures or if the exposure is in fact an asthma trigger for the child

- “Actions taken to reduce environmental exposures” have not been included but may be associated with both active asthma, exposure to environmental asthma triggers, and SES
• Possible ideas for future analyses:
  – Environmental asthma triggers at school
  – Environment modifications
  – Proportion of exposures in the home environment
  – ... and many more!
Thank You.

CONTACT: Erin Wickerham
Erin.Wickerham@dshs.state.tx.us
(512)776-3519
http://www.dshs.state.tx.us/asthma/default.shtm