

# Very Poorly Controlled Asthma in Adults



- Who has it
- How it affects medical resources

# Adults with Current Asthma

- Overall, about 9% of Washington State adults currently have asthma. Some adults are more likely to have current asthma\*:
  - Women
  - People with low annual household income
  - American Indian/Alaskan Native race
  - Current smokers
  - Obese

# Risk of Very Poorly Controlled Asthma?

- Since asthma prevalence differs depending on a number of different demographic variables, we wondered whether prevalence of very poorly controlled asthma also varied by demographic factors.
- We designed a study using indicators from the new guidelines to assign level of asthma control to respondents to an asthma survey.

# The Data:

**The Washington Behavioral Risk Factor Surveillance System (BRFSS):**  
a random digit telephone survey of adults ages 18 and older.

BRFSS Adult Asthma Call-Back Survey: Washington respondents to the BRFSS who had ever been told they had asthma were asked to participate in an additional asthma survey. About 4500 adults participated in the BRFSS Asthma call-back survey during **2006** and **2007**.

Corroborating Data: The Washington Comprehensive Hospital Abstract Reporting System (CHARS)

# 2007 Guidelines for Asthma

In August of 2007 the *National Asthma Education and Prevention Program (NAEPP)* released updated (*EPR-3*) *Guidelines for the Diagnosis and Management of Asthma*.

Using the new guidelines, the Provider Support Committee of the Washington Asthma Initiative designed a tool to help physicians determine how well their patients' asthma was controlled.

# Assessing Asthma Control

Table represents asthma control classifications for each age group. See "Asthma Stepwise Approach" chart for treatment recommendations.

	Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	<p><b>Symptoms:</b></p> <ul style="list-style-type: none"> <li>0-4: <math>\leq 2</math> days/week</li> <li>5-11: <math>\leq 2</math> days/week but not more than once on each day</li> <li><math>\geq 12</math>: <math>\leq 2</math> days/week</li> </ul> <p><b>Nighttime awakenings:</b></p> <ul style="list-style-type: none"> <li>0-11: <math>\leq 1</math> time/month</li> <li><math>\geq 12</math>: <math>\leq 2</math> times/month</li> </ul> <p><b>Short-acting B2-agonist use:</b></p> <ul style="list-style-type: none"> <li>All ages: <math>\leq 2</math> days/week</li> </ul> <p><b>Interference with normal activity:</b></p> <ul style="list-style-type: none"> <li>All ages: None</li> </ul> <p><b>Lung function:</b></p> <ul style="list-style-type: none"> <li>5-11: <math>FEV_1 = &gt;80\%</math> predicted/personal best; <math>FEV_1/FVC = &gt;80\%</math></li> <li><math>\geq 12</math>: <math>FEV_1/\text{peak flow} = &gt;80\%</math> predicted/personal best; <math>ACT = \geq 20</math></li> </ul>	<p><b>Symptoms:</b></p> <ul style="list-style-type: none"> <li>0-4: <math>\geq 2</math> days/week</li> <li>5-11: <math>\geq 2</math> days/week or multiple times on <math>\leq 2</math> days/week</li> <li><math>\geq 12</math>: <math>&gt; 2</math> days/week</li> </ul> <p><b>Nighttime awakenings:</b></p> <ul style="list-style-type: none"> <li>0-4: <math>&gt; 1</math> time/month</li> <li>5-11: <math>\geq 2</math> times/month</li> <li><math>\geq 12</math>: 1-3 times/week</li> </ul> <p><b>Short-acting B2-agonist use:</b></p> <ul style="list-style-type: none"> <li>All ages: <math>&gt; 2</math> days/week</li> </ul> <p><b>Interference with normal activity:</b></p> <ul style="list-style-type: none"> <li>All ages: Some limitation</li> </ul> <p><b>Lung function:</b></p> <ul style="list-style-type: none"> <li>5-11: <math>FEV_1 = 60-80\%</math> predicted/personal best; <math>FEV_1/FVC = 75-80\%</math></li> <li><math>\geq 12</math>: <math>FEV_1/\text{peak flow} = 60-80\%</math> predicted/personal best; <math>ACT = 16-19</math></li> </ul>	<p><b>Symptoms:</b></p> <ul style="list-style-type: none"> <li>All ages: Throughout the day</li> </ul> <p><b>Nighttime awakenings:</b></p> <ul style="list-style-type: none"> <li>0-4: <math>&gt; 1</math> time/week</li> <li>5-11: <math>\geq 2</math> times/week</li> <li><math>\geq 12</math>: <math>\geq 4</math> times/week</li> </ul> <p><b>Short-acting B2-agonist use:</b></p> <ul style="list-style-type: none"> <li>All ages: Several times per day</li> </ul> <p><b>Interference with normal activity:</b></p> <ul style="list-style-type: none"> <li>All ages: Extremely limited</li> </ul> <p><b>Lung function:</b></p> <ul style="list-style-type: none"> <li>5-11: <math>FEV_1 = &lt;60\%</math> predicted/personal best; <math>FEV_1/FVC = &lt;75\%</math></li> <li><math>\geq 12</math>: <math>FEV_1/\text{peak flow} = &lt;60\%</math> predicted/personal best; <math>ACT = \leq 15</math></li> </ul>
Risk	<p><b>Exacerbations requiring oral steroids:</b></p> <ul style="list-style-type: none"> <li>All ages: 0-1 per year</li> </ul>	<p><b>Exacerbations requiring oral steroids:</b></p> <ul style="list-style-type: none"> <li>0-4: 2-3 per year</li> <li><math>\geq 5</math>: <math>\geq 2</math> per year; consider severity and interval since last exacerbation</li> </ul>	<p><b>Exacerbations requiring oral steroids:</b></p> <ul style="list-style-type: none"> <li>0-4: <math>&gt; 3</math> per year</li> <li><math>\geq 5</math>: <math>\geq 2</math> per year; consider severity and interval since last exacerbation</li> </ul>
<p><b>Treatment-related Adverse Effects:</b> Medication side effects can vary from none to very troublesome and worrisome. Level of intensity should be considered in the overall assessment of risk.</p> <p><b>Reduction in Lung Growth (ages 5-11)/Progressive Loss of Lung Function (age 12+):</b> Evaluation requires long-term followup.</p>			

# Assigning asthma control levels

The **EPR-3** tool was used as a guide to assign levels. The indicators we used included:

- asthma symptom frequency
- frequency of asthma-related sleep interruption
- degree of activity limitation

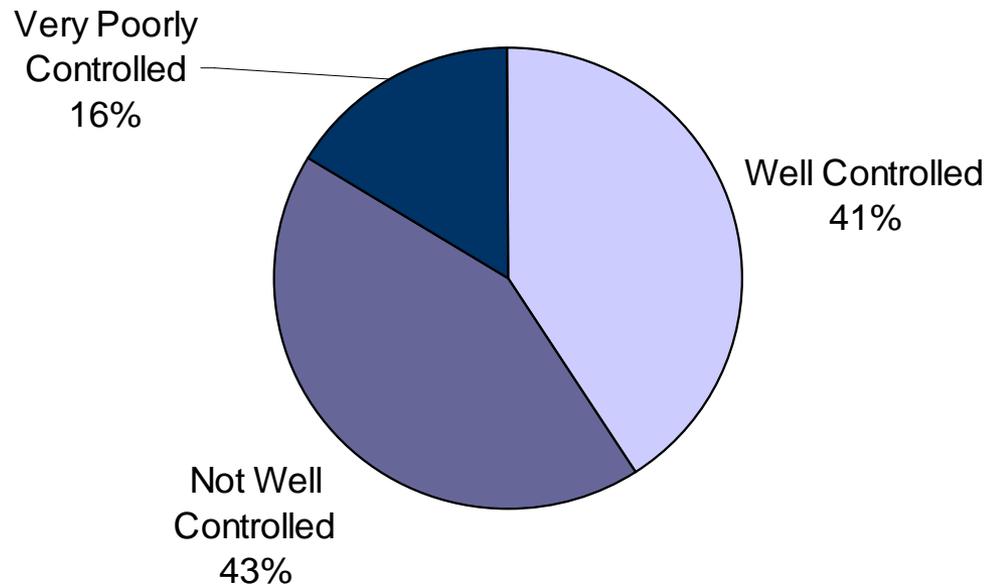
We were able to include 3,543 respondents in our study :

2,783 women (79%)

760 men (21%)

# Prevalence of assigned asthma control levels among Washington adults with asthma

**Washington Adults with Asthma, 2006-2007:  
Levels of Control**

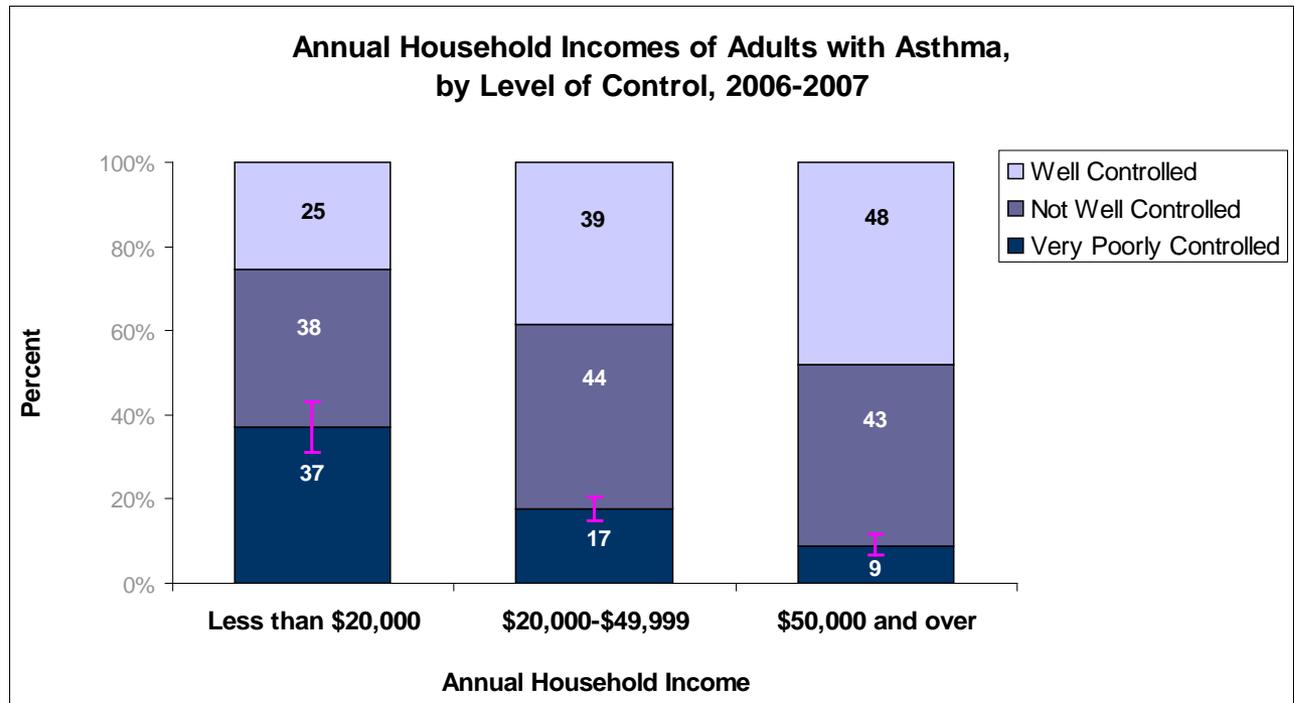


# Demographics

SEX: **Women** were significantly more likely to have very poorly controlled (VPC) asthma than men, 18% versus 12%, respectively (*figure not shown*).

Income:

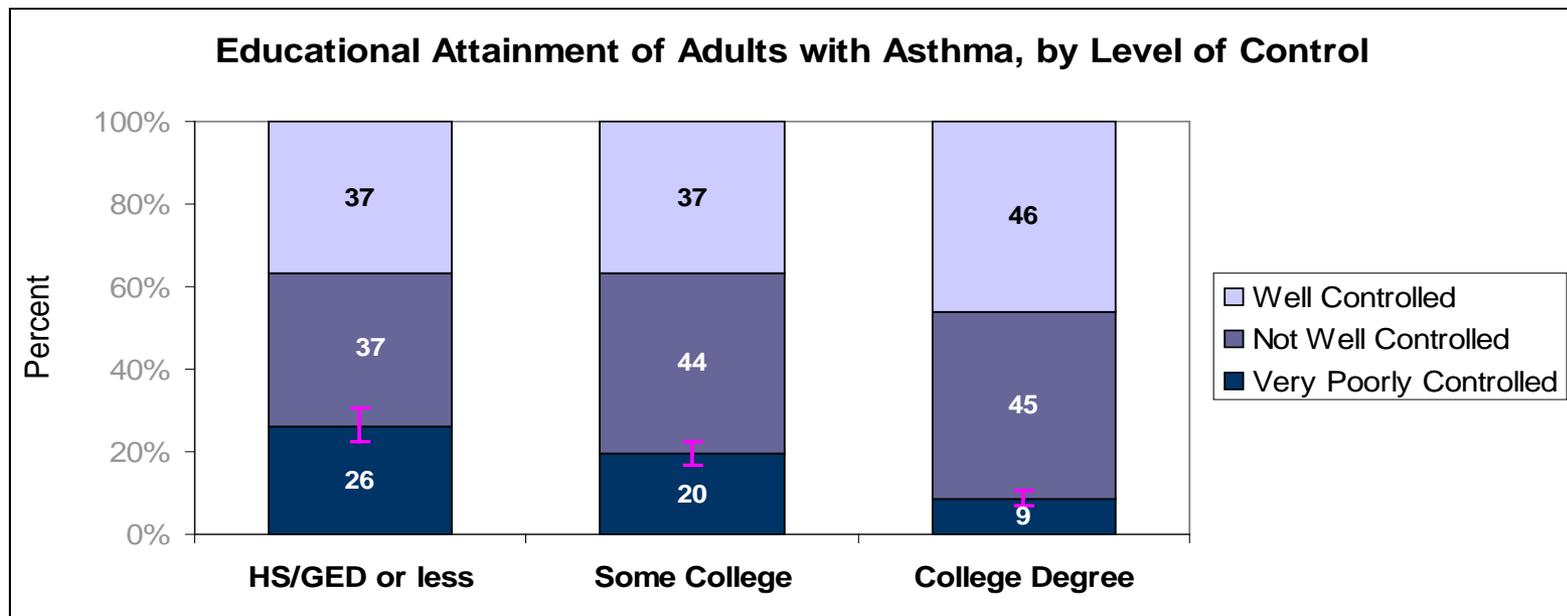
Adults with low income were significantly more likely to have VPC asthma.



# Demographics, cont.

## Education:

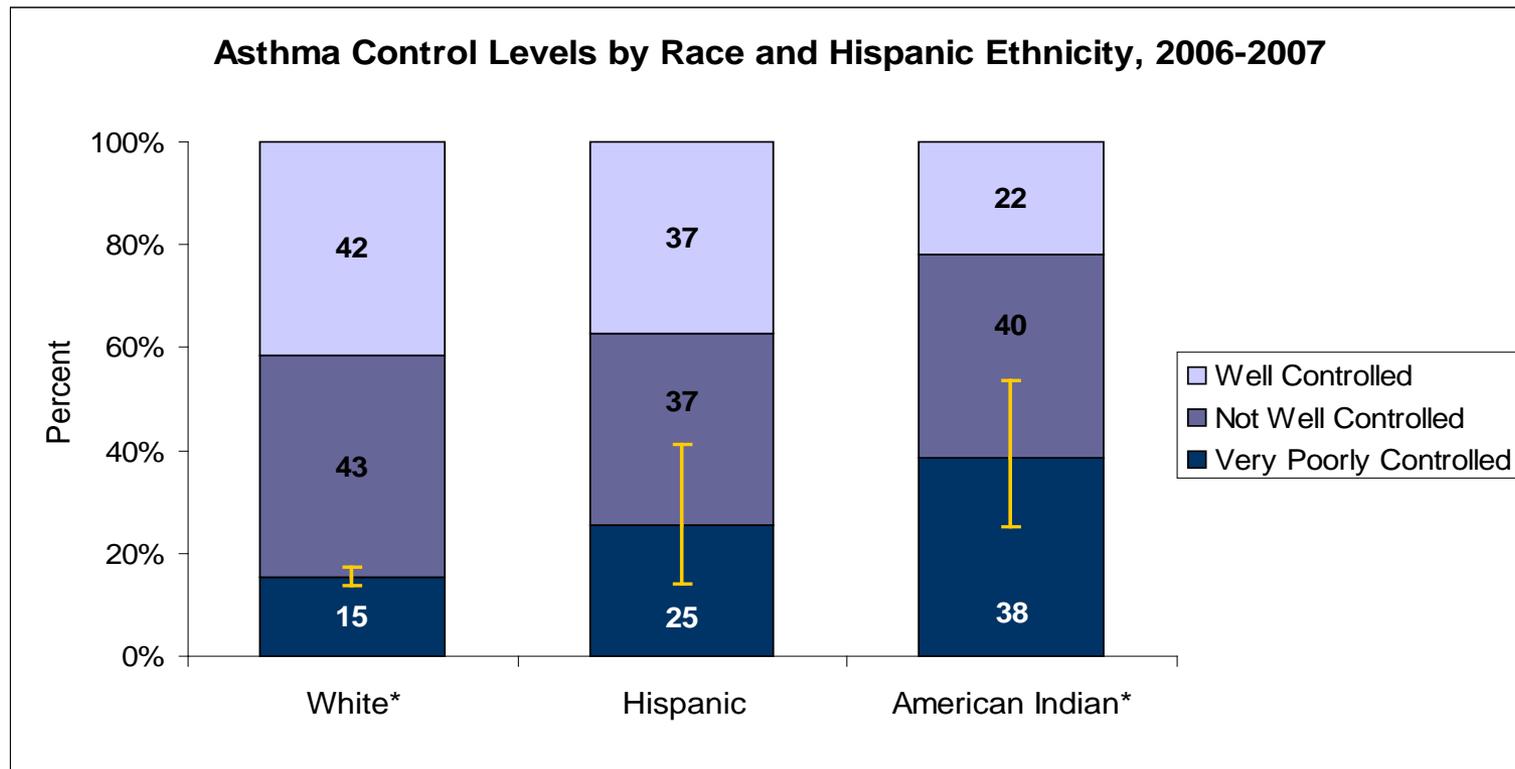
Adults with low educational attainment were significantly more likely to have VPC asthma than adults with more education.



\* Age restricted to 25 and older.

# Demographics, cont.

Race / Ethnicity: Hispanics and non-Hispanic American Indians / Alaskan Natives were more likely to have VPC asthma.



\*non-Hispanic

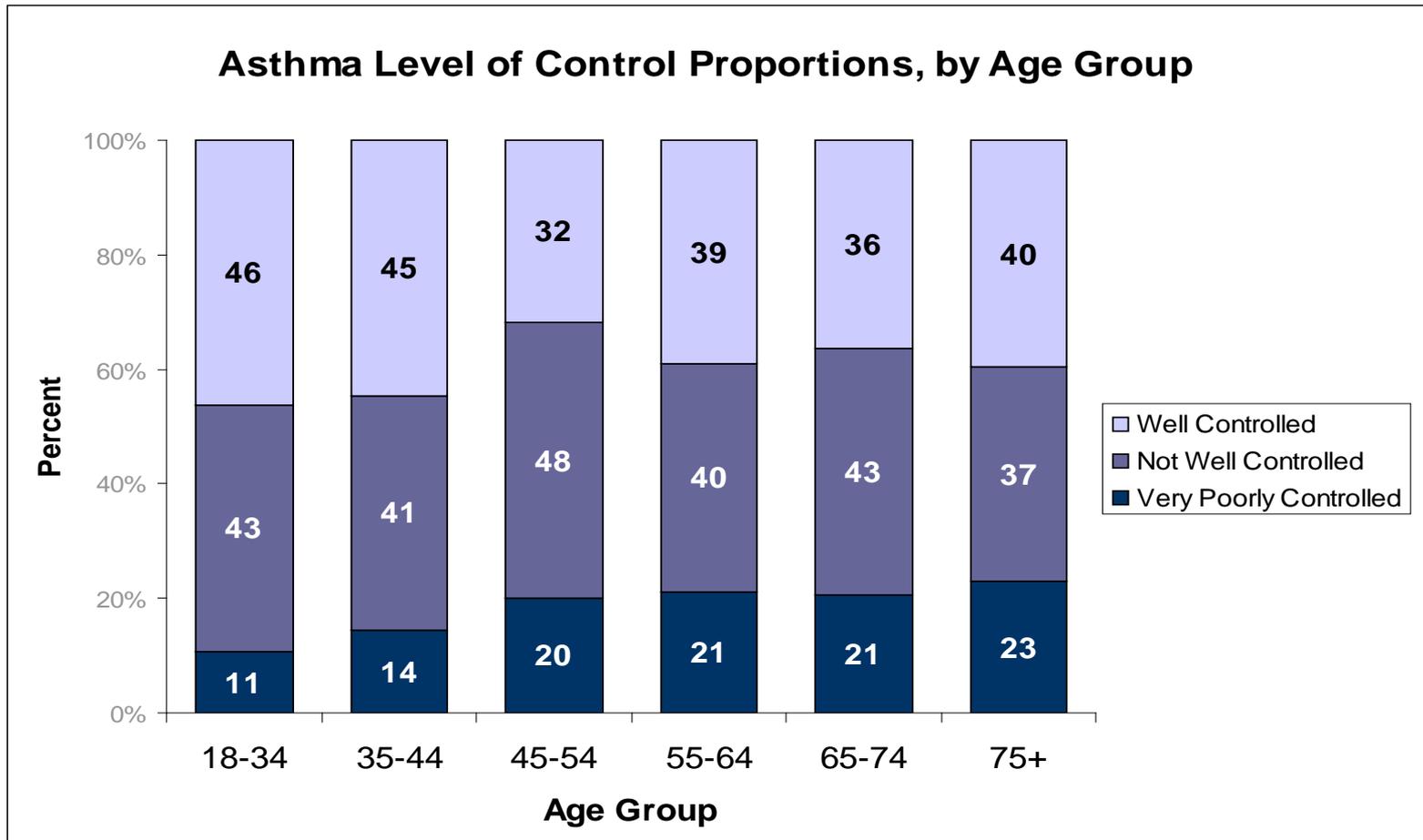
*P* value for Hispanics was 0.06.

*Insufficient numbers to show Black or Asian/Pacific Islander percentages.*

**CASE HISTORY 3:** Adolescent female Hispanic client has eczema, allergic rhinitis and severe asthma. First visit by A.E. shows some prescriptions in English (parents speak only Spanish). Also, client has confused which asthma medication is to be taken *daily* and which is to be taken *as needed*. A.E. works with the family to identify when each medication is to be taken and the girl's asthma improves. However, the family is on Basic Health and they receive a letter saying they will be booted off because the parents make too much money (2 income family). Dad continues to purchase needed medications (\$215/month). Since Basic Health does not have provisions for interpreter services non-Spanish speaking A.E. cannot communicate with parents (NOTE: Healthy Options will pay for interpreter services). Currently Asthma project cannot visit family due to lack of interpreter services. Hiring a new bi-lingual A.E. on Community HealthCorps funds will allow follow-up with client.

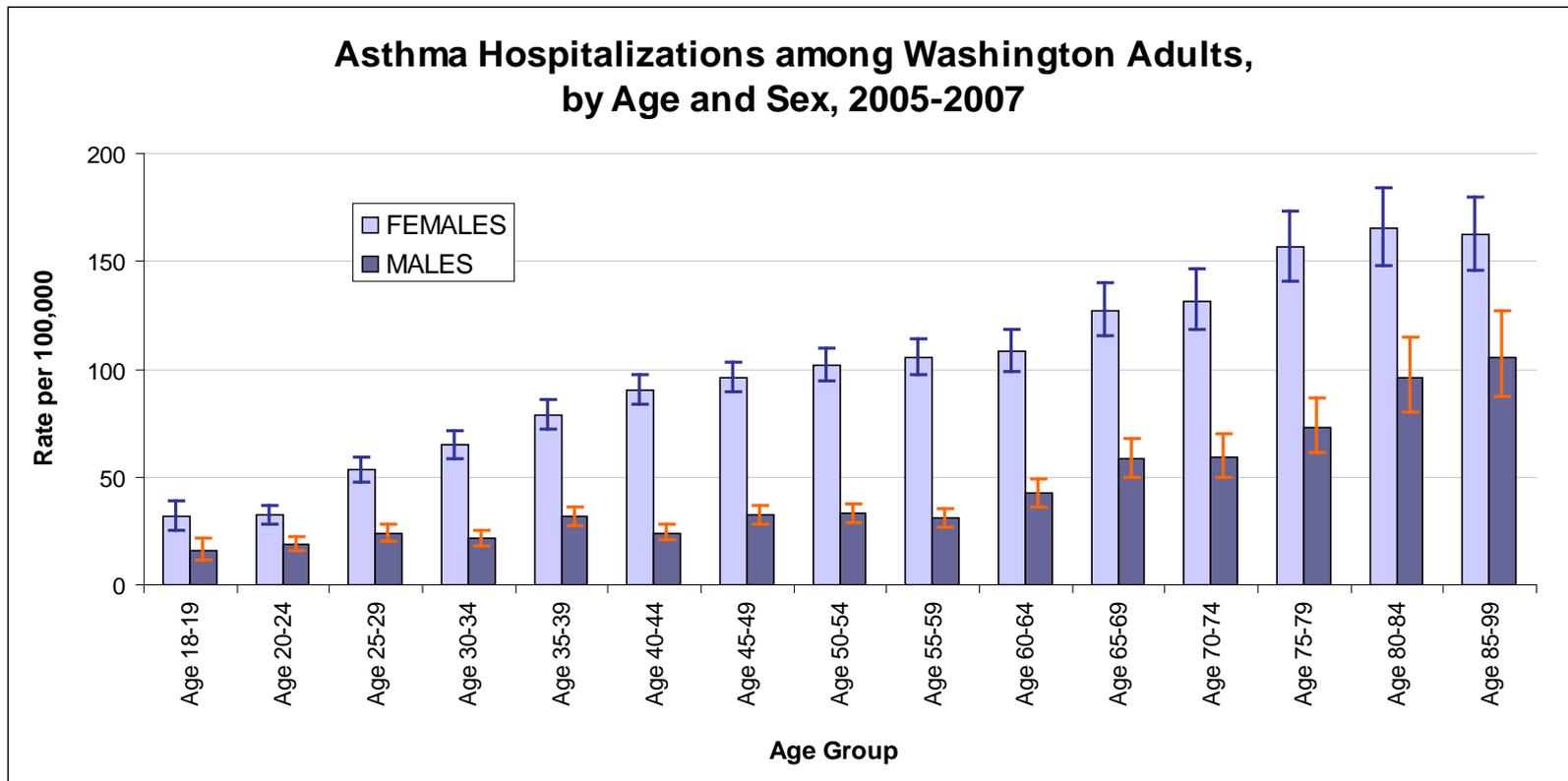
# Demographics, cont.

AGE: As age increased, so did prevalence of VPC asthma.



# Supporting Data from CHARS

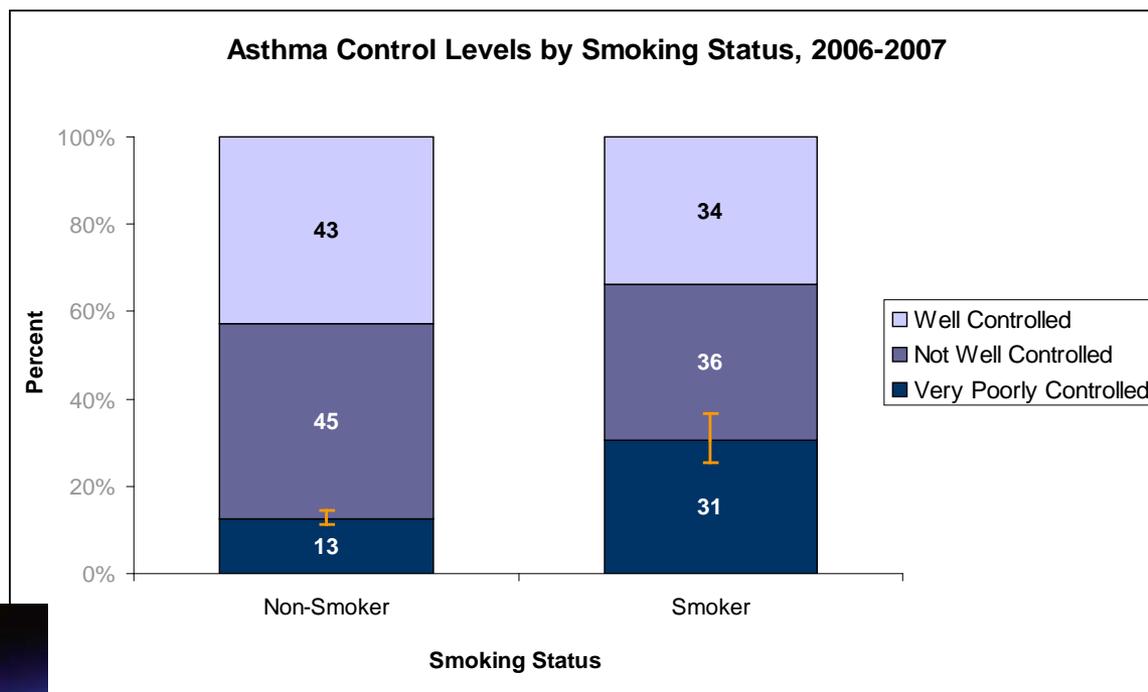
Data from CHARS supports the relationship between increasing age and higher hospitalization rates among adults with asthma.



**CASE 1:** Elderly Hispanic women is placed on expensive asthma medication (Advair). When visited by Asthma Educator (A.E.) she complains about cost (~ \$150/mo.) but is more concerned that medication *does not work!* A.E. watches while client takes her medication from a dry powder inhaler (DPI) and sees that the woman's severe arthritis makes actuating the medication extremely difficult (difficult to make contact with lever with distorted fingers). Even when client's husband assists in actuating medication, her lung functions are so compromised (use of peak flow meter shows PEF at 55% of expected) she cannot pull the powder out of the inhaler. A.E. suggests PCP switch back to metered dose inhaler to be used with spacer as the MDI does all the work. A.E. also enlists daughter-in-law to come to house **twice daily** to assist with medication use since even MDI is too difficult for arthritic fingers.

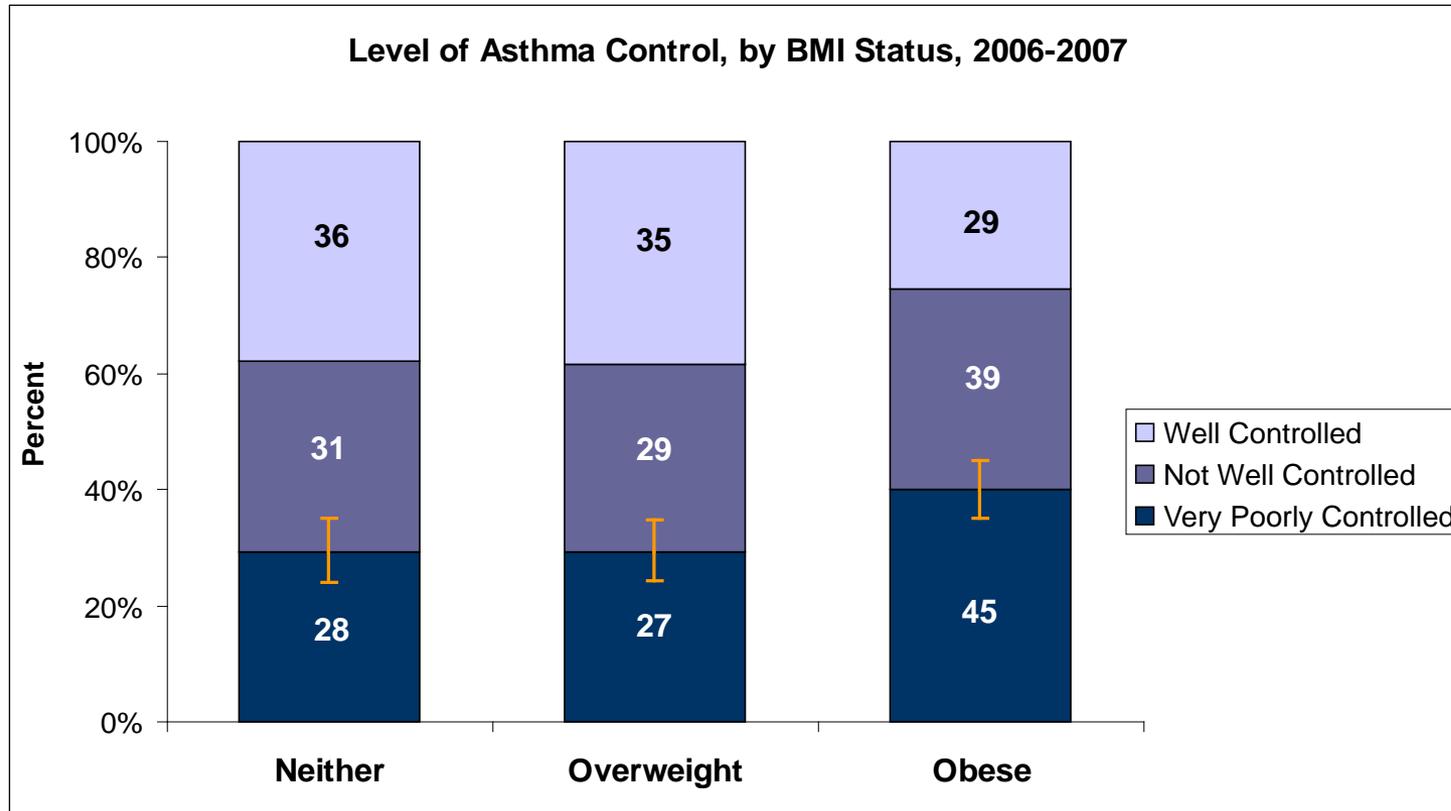
**NOTE:** Switch back to MDI and away from combination medication (Advair) drops medication cost to \$10/mo. versus \$150.

SMOKING: Adults with asthma who were current smokers were more than twice as likely as non-smokers to have very poorly controlled asthma.



**CASE HISTORY 2:** Elderly Hispanic male has insurance that will pay for expensive combination medication (Advair), however, client has similar difficulty using DPI in that his lung functions have deteriorated greatly due to smoking and years without good medical care and appropriate medications. A.E. suggests that PCP switch from DPI to MDI with same medication. A.E. instructs client in use of a spacer that will allow 3X as much medication to the lungs. Client seems to be making some headway but due to loss of relatives (client is 79 so most uncles and aunts will not live much longer), his wife moving back in with him (she tells him what he needs to do and he rebels accordingly) and apparent dementia (he either forgets to take his medication or simply does not want to take it) client is not doing well. A.E. continues to look for ways to encourage appropriate behavior relative to medication use and environmental trigger control.

# OBESITY: Respondents who were obese were about 60% more likely to have VPC asthma.

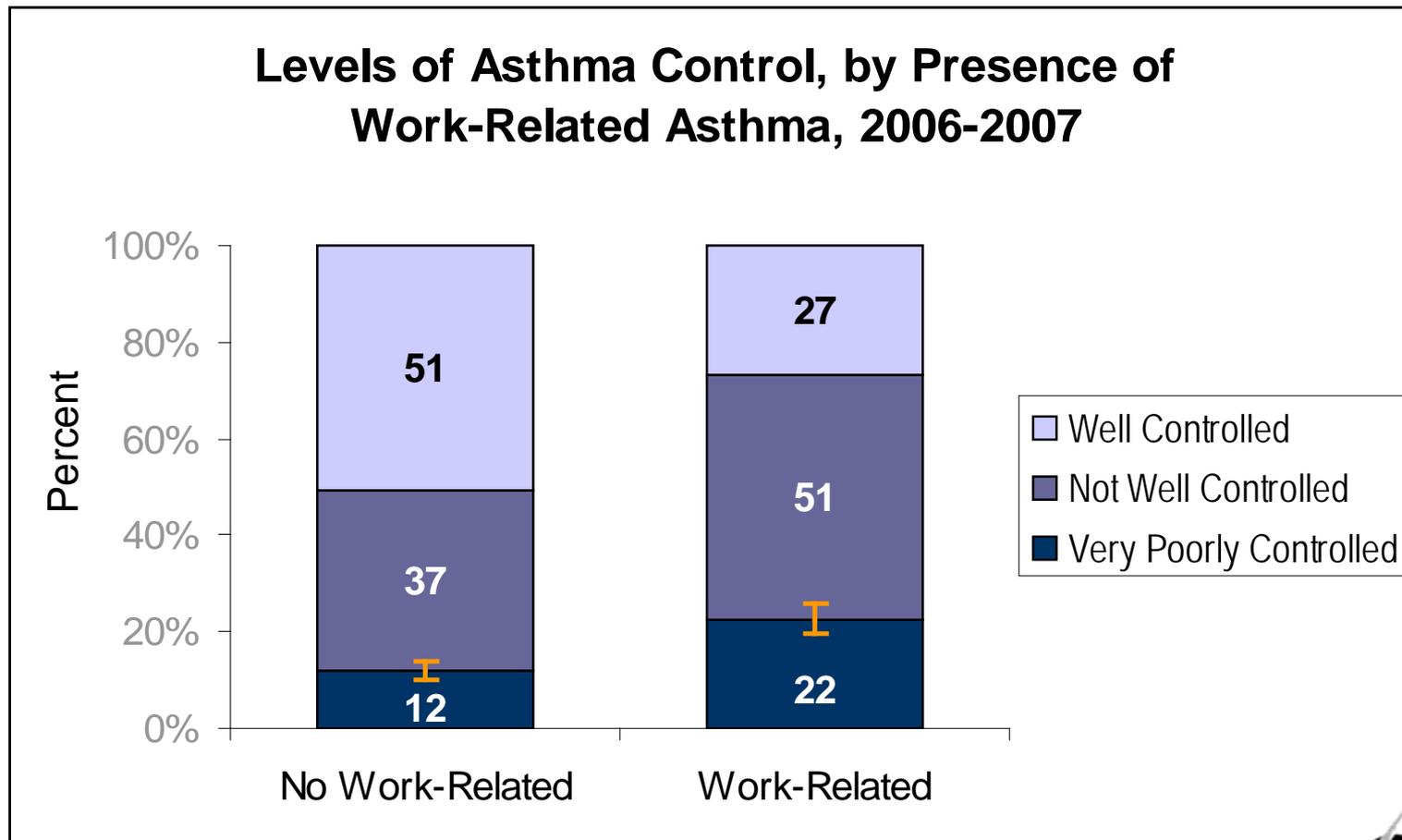


*In a study published in 2007, overweight or obese adults with asthma were more likely (than normal or underweight adults with asthma) to have asthma-related inpatient hospitalizations.\**

\*Rodrigo GJ, Plaza V. Chest 2007. 132:1513-1519.

# Occupational Exposures:

Respondents who reported any work-related asthma\* were almost twice as likely to have VPC asthma as those who had not had worksite exposures.

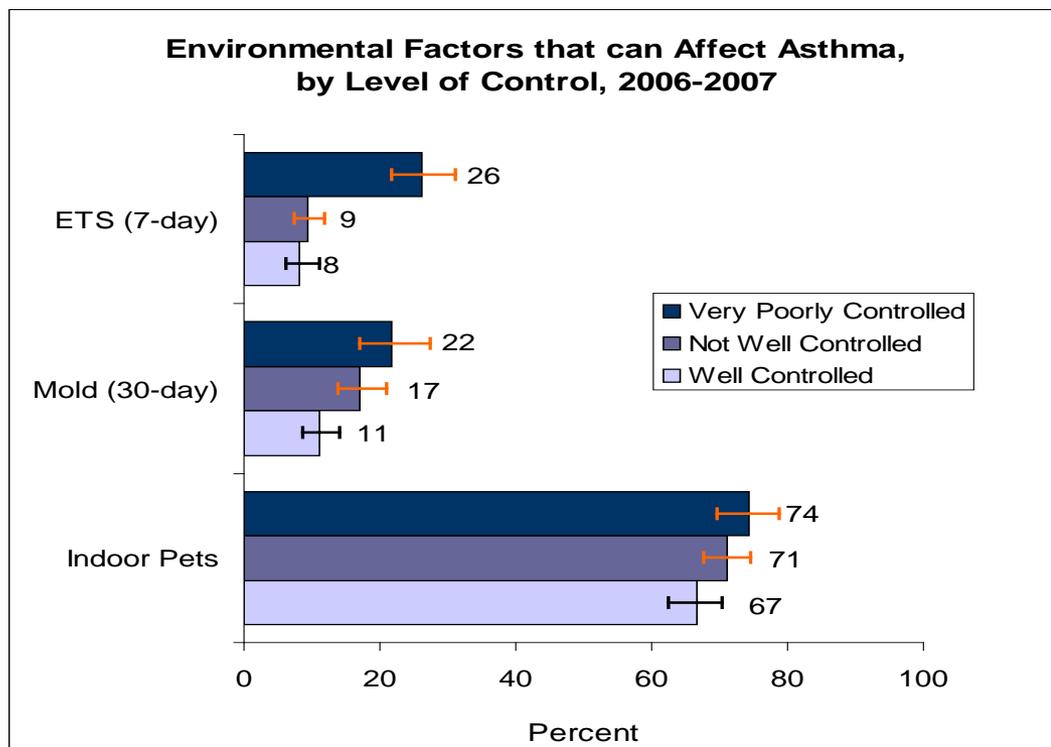


\*Asthma that was caused or worsened by exposures in current or previous job.

**CASE HISTORY 4:** Middle-aged English-speaking male client is Vietnam War Veteran with potential exposure to *Agent Orange*. Same client was working at a fertilizer plant where he received exposure to pollutants which seem to have caused irreversible lung damage. Client is being booted off Labor & Industries benefits as "he should be able to find work somewhere." Client was prescribed Advair DPI but was not doing well. Since lung functions were about 55% of normal he suffered same problems as example 1 & 2 above. A.E. recommended PCP prescribe an MDI which will deliver the same medication under pressure (PCP does and client's quality of life improves). Now client is attempting to get on SSI as he is doing so poorly he cannot function in the working world. He has been denied twice. He continues with the Asthma Project.

# Prevalence of Environmental Factors

Respondents with VPC asthma were more likely to have had **mold** in their homes in the past month or had **someone smoking** inside their home in the past week, compared with adults whose asthma was better controlled. **Indoor pets** also appeared to be more common among those with VPC asthma, but the difference was not statistically significant.

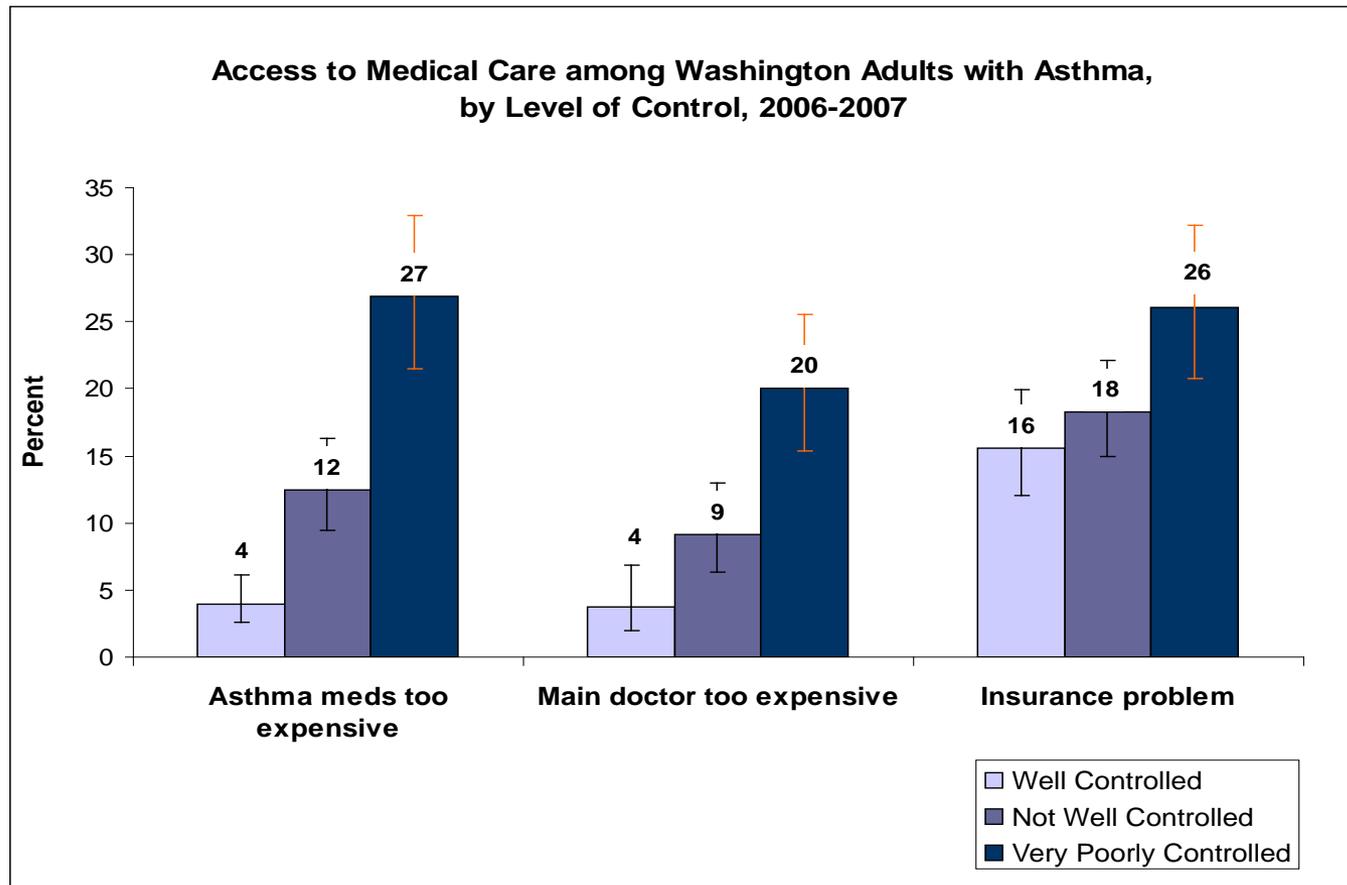


*In a 2008 study by Portnoy et al, the presence of mold in the home was found to be associated with worsening asthma.\**

\* Portnoy JM, Barnes CS, Kennedy K. Current Allergy and Asthma Reports, 2008. 8:71-78.

# Access to Care:

Respondents with **VPC** asthma were more likely to report inability to afford asthma medications or doctor visits, and either no insurance or breaks in coverage during the previous 12 months, compared to respondents whose asthma was better controlled.



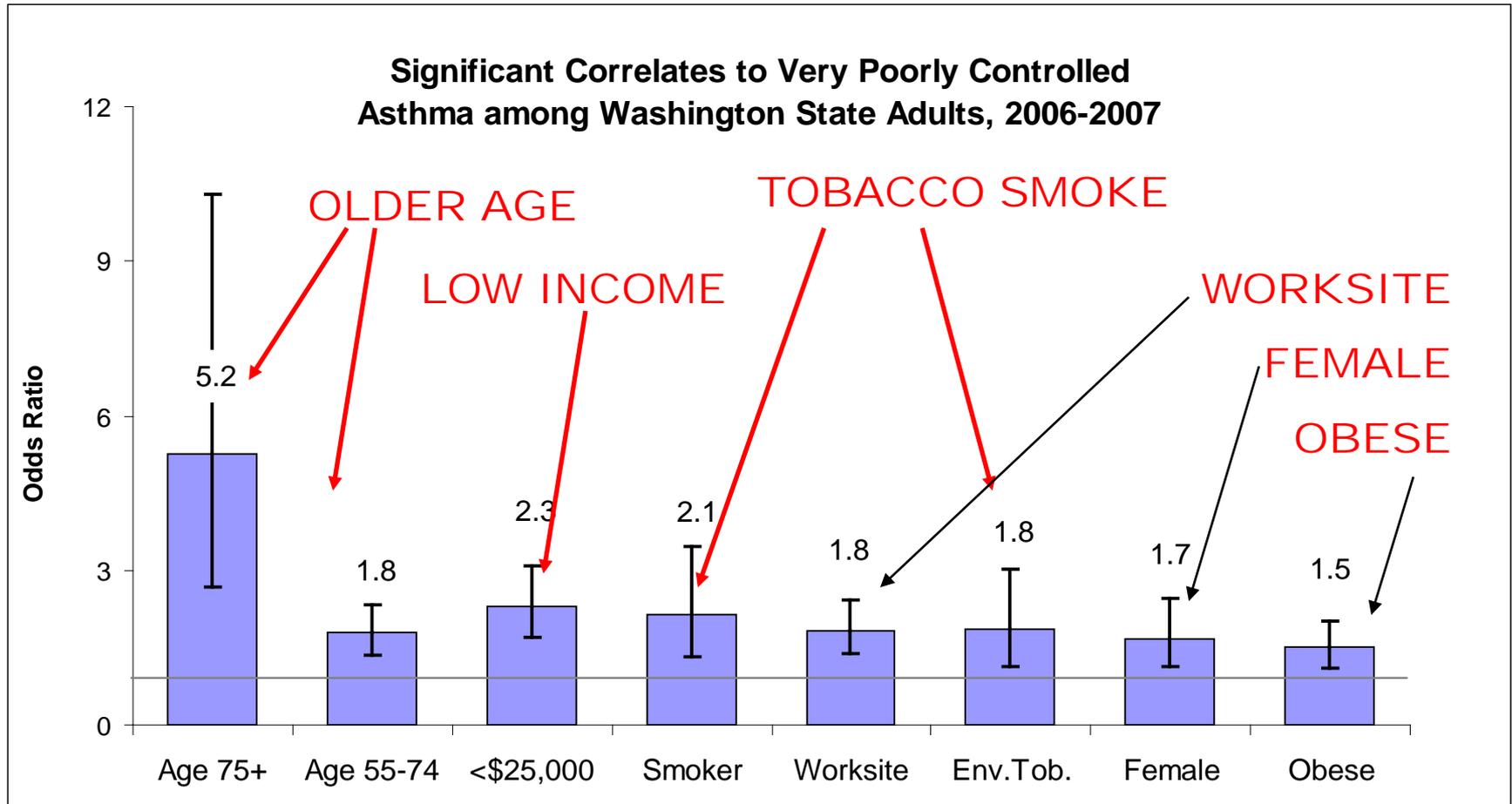
- A 2007 report in the journal *Respiratory Medicine* linked the inability to afford medication refills to asthma severity.\*



\* Stallberg B, et al. *Respiratory Medicine* 2007. 101:2076-2083.

# Regression Analysis

When everything is taken into account, what are the significant factors related to VPC asthma?



*Is very poorly controlled  
asthma a major public health  
issue?*



# Uncontrolled Asthma:

## Examples of recent studies published in medical journals:

Ø Uncontrolled asthma may lead to further decline in lung function. <sup>1</sup>

Ø Poor control of asthma is associated with future severe asthma-related healthcare events. <sup>2</sup>

Ø As asthma control declines, so does quality of life. <sup>3</sup>

Ø Higher severity of asthma is linked to greater likelihood of depression. <sup>4</sup>

<sup>1</sup> Bai TR, et al. Eur Respir J 2007. 30:452-456.

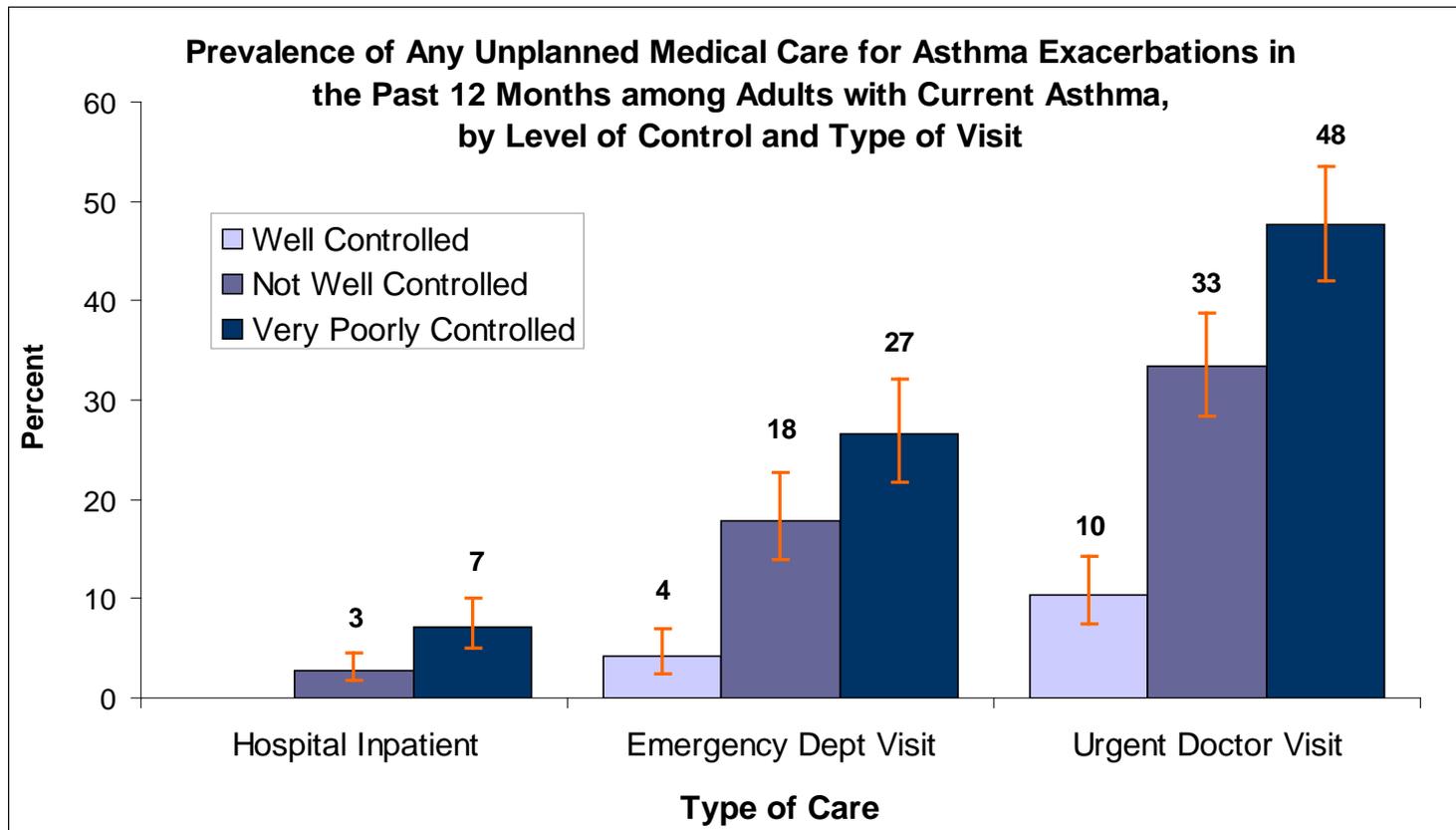
<sup>2</sup> Sullivan SD, et al. Allergy 2007. 62:655-660.

<sup>3</sup> Chen H, et al. J Allergy Clin Immunol 2007. 120:396-402.

<sup>4</sup> Mancuso CA, et al. Chest 2008. 133:1142-1148.

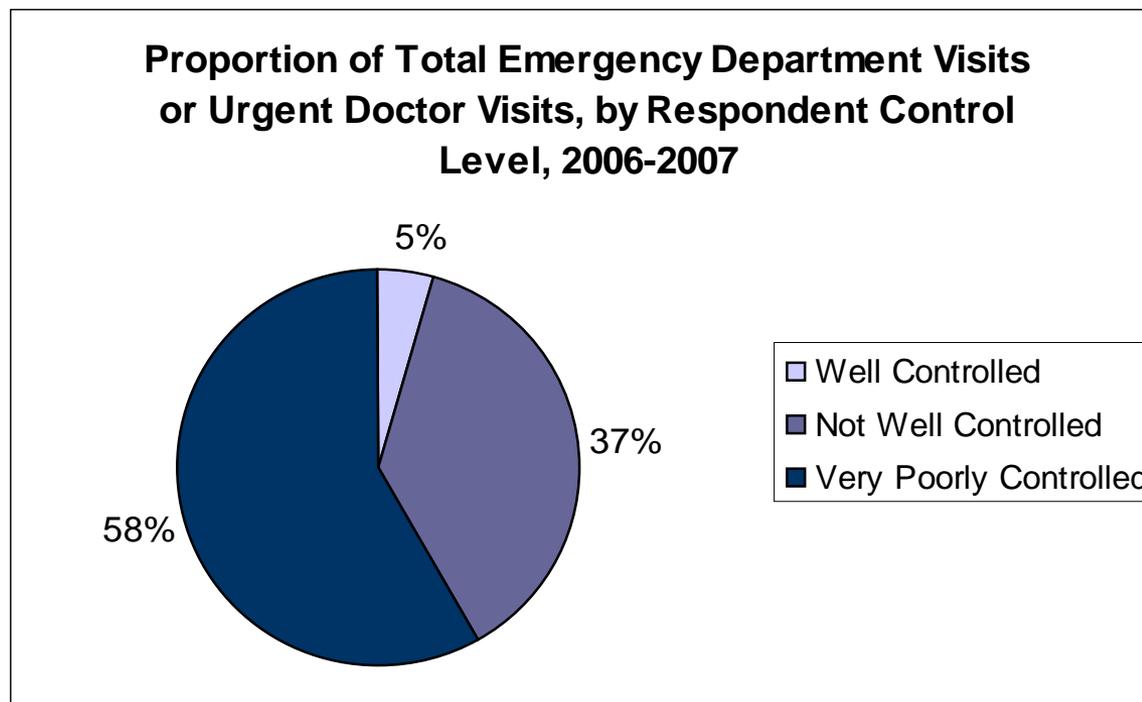
# Use of Medical Resources

About half of adults with VPC required an asthma-related urgent doctor visit during the previous 12 months. About one-fourth visited an emergency department for their asthma, and 1 out of every 14 had an inpatient hospitalization.



# COUNTS of Unplanned Medical Visits:

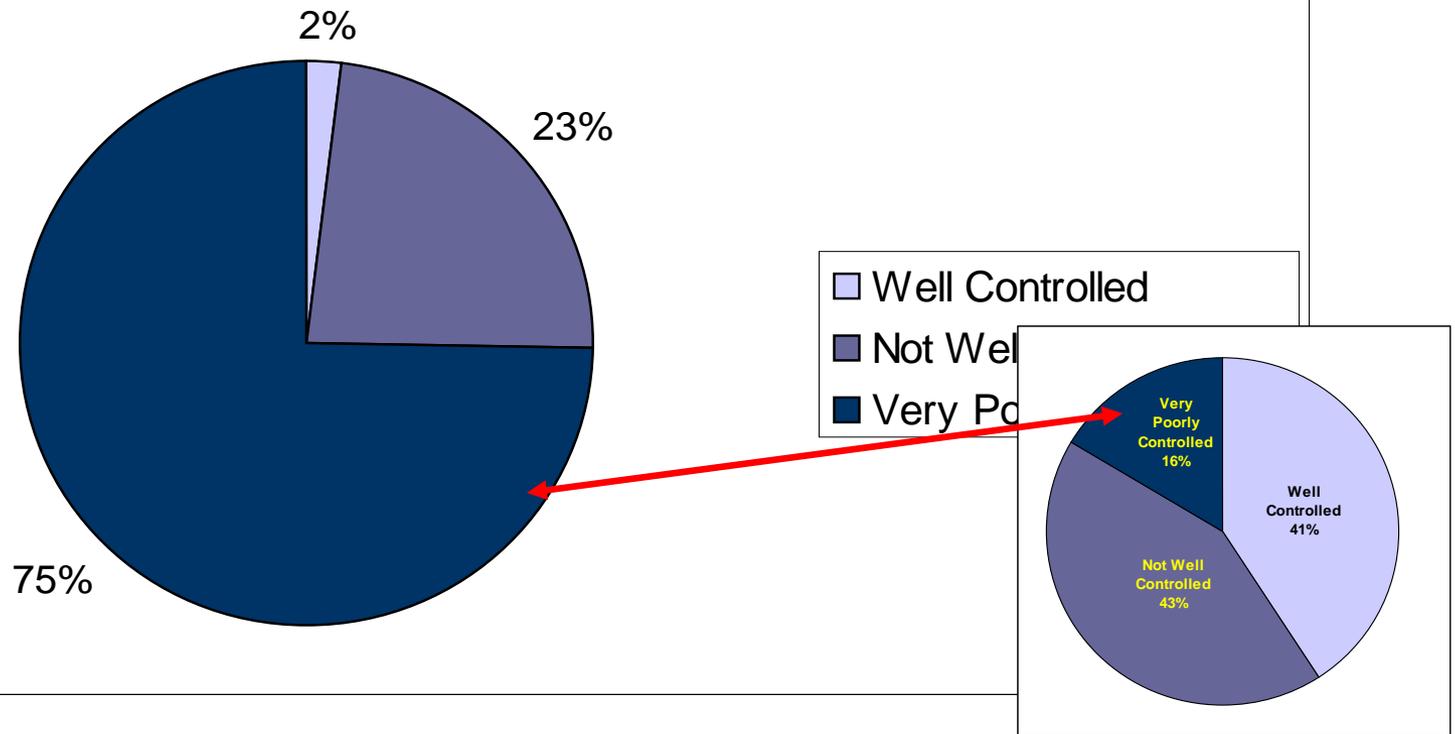
Respondents in our study reported a total of **1707 urgent doctor visits** and **662 emergency department visits** during the previous 12 months. In both cases, respondents with VPC asthma accounted for **58%** of these types of visits. Those whose asthma was *well controlled* accounted for only 5% of unplanned medical visits.



# Hospitalization Counts:

75% of hospitalizations reported by respondents in our study were among those with VPC asthma (*total hospitalizations = 163*).

**Proportion of Total Asthma Hospitalizations by Respondent Control Level, 2006-2007**



# Cost of Asthma Hospitalizations in WA State

- Hospital charges for asthma in 2007 (as first diagnosis) were about \$48.2 million\*.
  - **Medicare - 22%** (*~\$10.7 million*)
  - **Medicaid - 28%** (*~\$13.7 million*)
  - Healthcare Service Contractor – 16%
  - Commercial Insurance – 15%
  - HMO – 8%
  - Self pay – 8%
  - All other – 3%

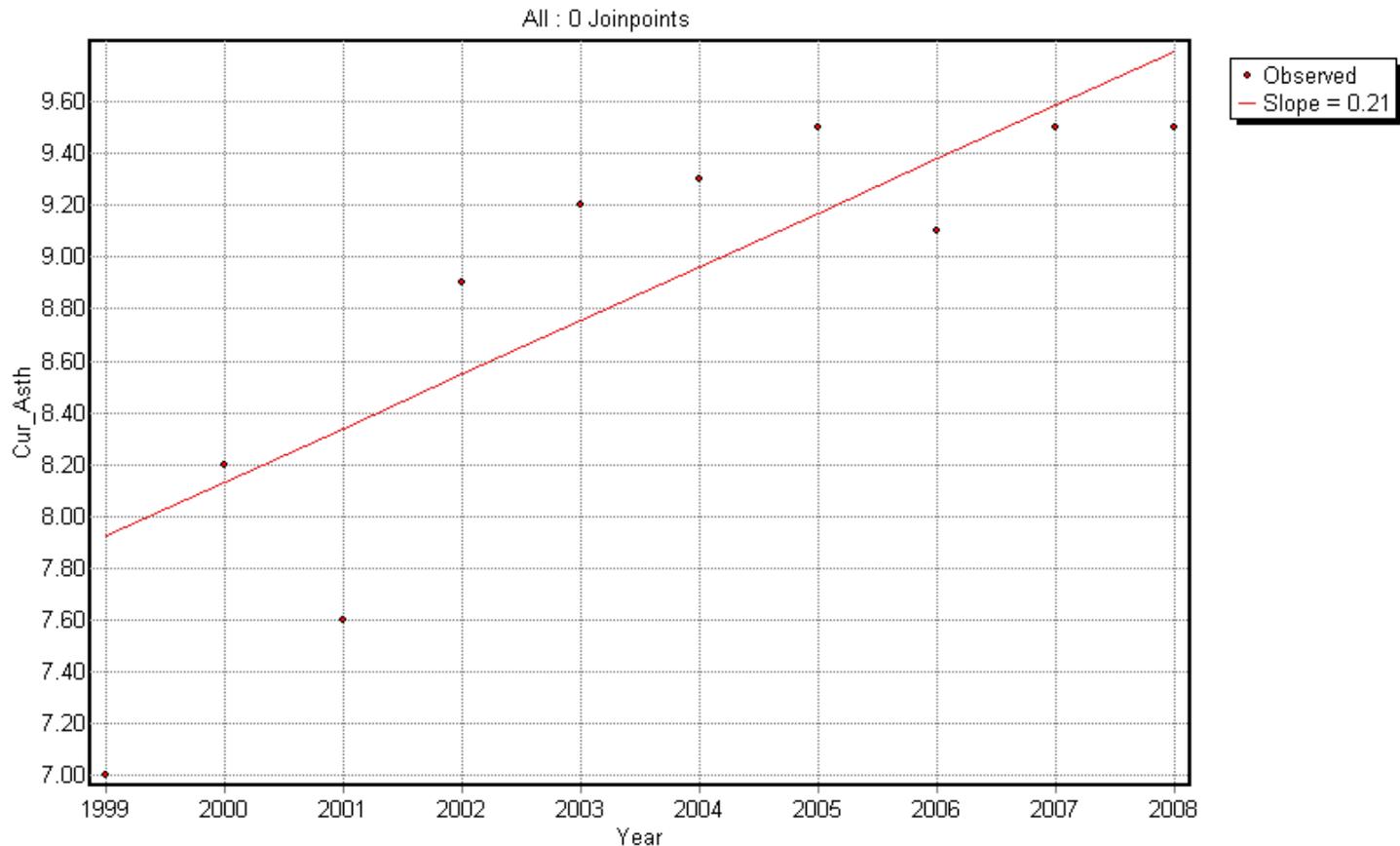
\* Data from Comprehensive Hospital Abstract Reporting System (CHARS)

# How are we doing?

- 2008 Rates: Current Asthma among Adults
- Respondents' reports of provider practices
- Inhaled Corticosteroid use

# Adult Current Asthma in Washington State, 1999-2008

9.5% of English-speaking adult respondents to the 2008 BRFSS had current asthma (age-adjusted rates).



# Asthma Management Help Received from Health Care Professionals: Somewhat better for VPC in many cases, but not in all.



# Studies reinforce the need for strong patient education:

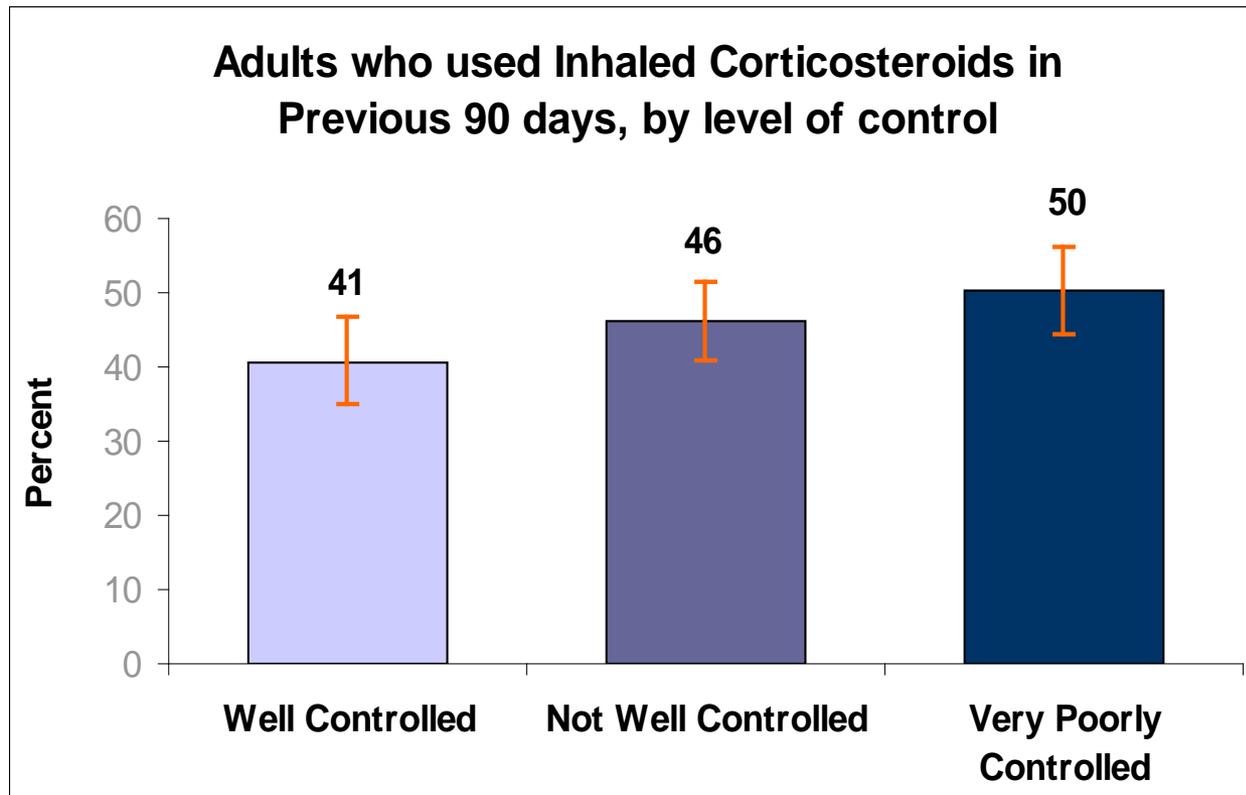
- Adult asthma patients may underestimate the severity of their asthma.<sup>1</sup>
- Patient non-compliance with asthma treatment has been linked to difficult to control asthma.<sup>2</sup>

<sup>1</sup> Lurie A, et al. Respiratory Medicine 2007. 101:2145-2152.

<sup>2</sup> de Araujo AC, et al. J Bras Pneumol 2007. 33:495-501.

# Corticosteroid Use

Only half of respondents with VPC asthma had used an inhaled corticosteroid in the previous 90 days.



*There was no significant difference in inhaled corticosteroids use by level of asthma control.*

# Where do we go from here?

- Support programs and policies that assure affordable doctor visits and medications for low income adults.
- Support asthma education programs to help people with asthma learn how to manage their own asthma.
- Help communities to address issues of poverty and poor housing that can negatively impact people with asthma.



# Where do we go from here? (continued)

Improved health care provider practices:

Promote adherence to the latest asthma guidelines:

- Education at every step
- Appropriate use of ICS
- Planned visits
- Written asthma action plans
- Discussion of triggers



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***Comments and feedback are always welcome***

**Contact Information:**

**Linda Gunnells, Epidemiologist**  
Chronic Disease Prevention Unit  
Washington State Department of Health  
PO Box 47855  
Olympia WA 98504-7855  
(360) 236-3852

**[linda.gunnells@doh.wa.gov](mailto:linda.gunnells@doh.wa.gov)**