



## Asthma and Asthma-Related Health Care In Children Enrolled in HUSKY A: CY 2003

March 2005

This report is the sixth annual report on asthma and asthma-related health care in HUSKY A (Medicaid managed care), issued by the Children's Health Council through 2003 and by Connecticut Voices for Children in 2005.<sup>1</sup> Rates for calendar year 2003 are compared with rates for the prior five years. The purpose of ongoing monitoring is:

- To estimate the prevalence of asthma among children enrolled in HUSKY A;
- To describe asthma-related health care among children enrolled in HUSKY A; and
- To identify trends and factors associated with access to care.

### METHODS

#### Study Population

Using HUSKY A enrollment data, children under 21 years of age who were continuously enrolled (any plan) between January 1 and December 31, 2003, were identified.<sup>2</sup>

#### Data

HUSKY A encounter data were searched for records corresponding to outpatient, inpatient and emergency care with a primary or secondary diagnosis of asthma (ICD-9-CM code 493.0-493.9) received during that one-year period. Encounter records were also searched for visits for conditions related to asthma.<sup>3</sup>

#### Measures of Prevalence

The prevalence of asthma, that is physician-diagnosed asthma recorded on an encounter record, was estimated by determining the percentage of all continuously enrolled children who received any care with an asthma diagnosis during CY 2003. Since variability from year to year may be attributable at least in part to HUSKY enrollment dynamics, differences in access to health care, and changes in data quality, three-year rolling averages were calculated to generate more stable estimates of disease prevalence overall and for subgroups of interest. Unadjusted rates are reported. After adjusting for age, gender, primary language, residence and health plan, the likelihood of having had an asthma diagnosis was determined by race/ethnic group. Previous studies have shown that asthma prevalence estimates can vary considerably, depending on the data source.<sup>4, 5</sup>

## **Measures of Utilization**

Asthma-related health care was described in terms of the number of visits for ambulatory care (average, range), percentage of children with more than one visit for asthma-related care, and percentages of children with emergency department visits and hospitalizations. After adjusting for age, gender, primary language, residence and health plan, the likelihood of having had an asthma diagnosis was determined by race/ethnic group.

## **Measure of Quality**

One dimension of the quality of care was assessed by measuring the percentage of children who were seen for follow-up within 2 weeks of an emergency department visit or discharge from the hospital, as recommended by the National Heart, Lung and Blood Institute.<sup>6</sup> The percentage of children who were seen for ambulatory care follow-up for asthma or asthma-related diagnoses was determined by health plan for the first emergency visit or hospital discharge for each child with any emergency care or hospitalization.

## **Limitations**

Prevalence estimates in this report are based on secondary analyses of readily available, uniformly coded encounter data corresponding to care received by children with asthma; however, the methods used to generate these estimates affect and limit interpretation of the results. First, prevalence estimates were based on the health care experiences of continuously enrolled children. Any significant changes in enrollment, access to care, and quality of care can affect prevalence estimates based on health services utilization. Second, the completeness and accuracy of the encounter data could not be assessed. What appear to be increases or decreases in prevalence and utilization over time may be due in part to changes in the quality of data submissions. Third, depending on the data source, prevalence estimates can vary significantly. Fourth, neither the severity of the condition nor the appropriateness of clinical care can be assessed using administrative data alone. Despite these limitations, this approach to tracking asthma prevalence and asthma-related health care utilization among children at increased risk is a useful adjunct to other surveillance efforts and program performance monitoring.<sup>7</sup>

## **RESULTS**

### **Description of the Study Population**

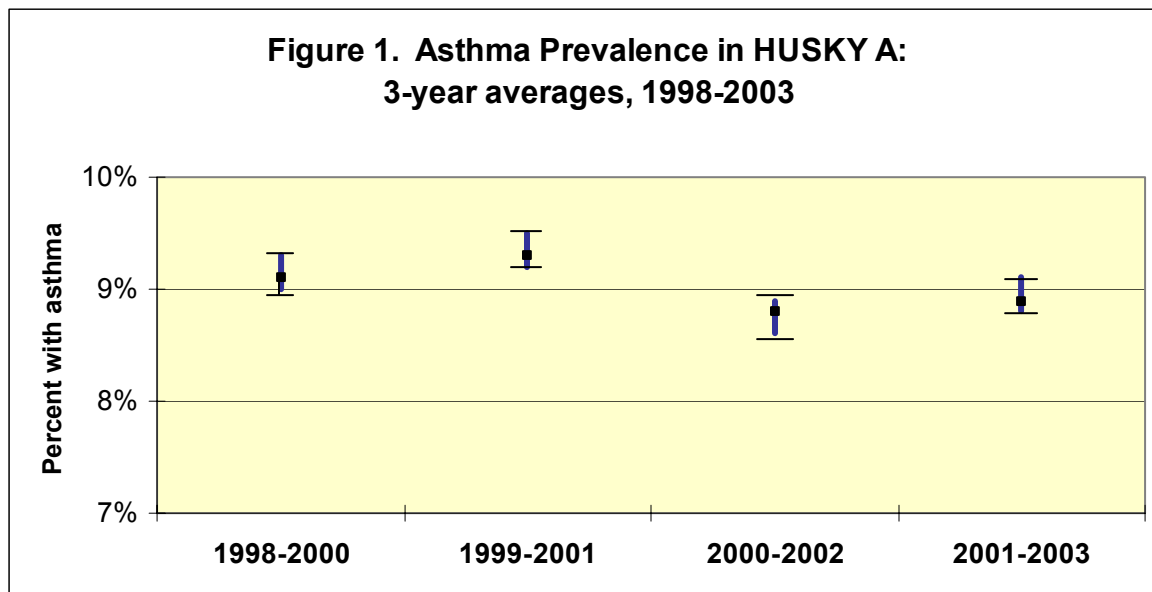
There were 163,615 children younger than 21 years continuously enrolled in HUSKY A in 2003, up 16.5% from the previous year. The sociodemographic and enrollment characteristics of these children are described in Table 1.

### **Estimated Prevalence of Pediatric Asthma**

In 2003, 15,014 children (9.2%) received care with an asthma-related diagnosis (Table 2), up significantly from 8.1% in FY 2002 (Table 3). However, 3-year averages suggest that the percentage of children who receive care for asthma is fairly stable at around 9% (Figure 1).

Asthma prevalence in 2003 was associated with age, gender, race/ethnicity, health plan, and residence (Table 2). The prevalence of asthma was significantly higher among:

- Children age 1-5 years, compared with older children (Figure 2);
- Boys, compared with girls;
- Hispanic children, compared with African-American children;
- African-American children compared with White children; and
- Children living in Bridgeport, compared with those living in Hartford, New Haven or other Connecticut towns.



**Note:** 3-year prevalence estimates shown with upper and lower bounds of 95% confidence interval.

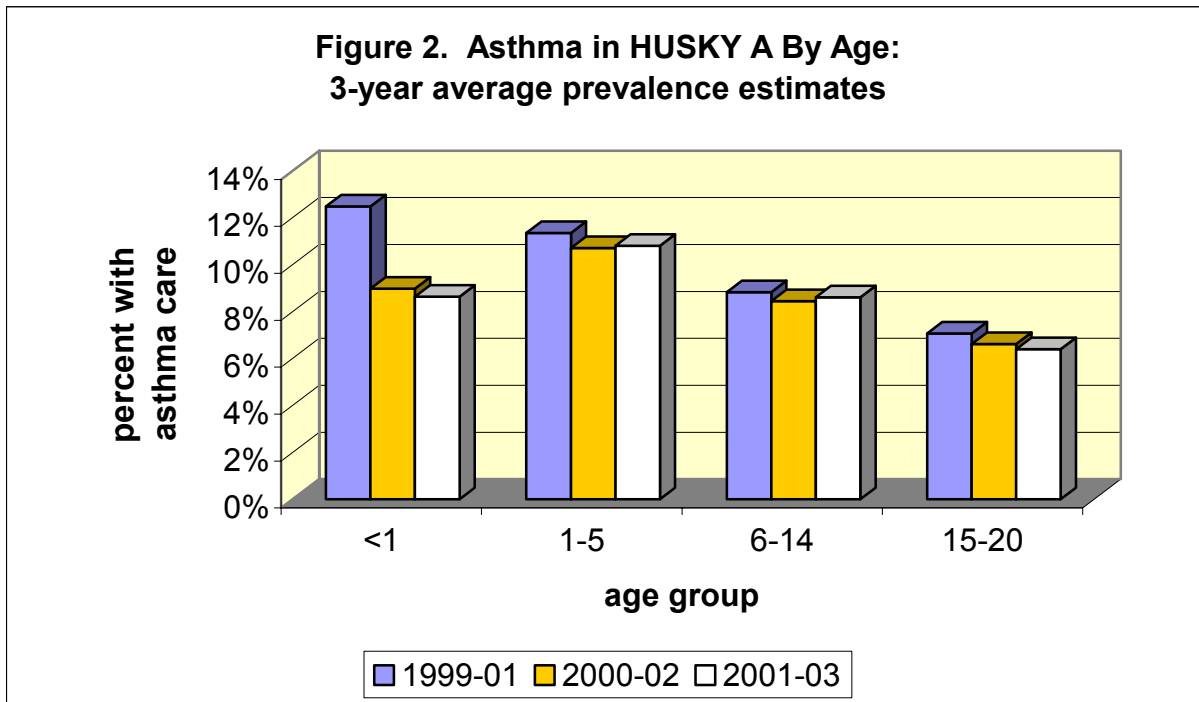
After adjusting for age, gender, primary language, residence and health plan, the likelihood of having had care with an asthma diagnosis was about 10 percent higher for Black African American children (OR=1.12; 95% CI: 1.07, 1.18) and 50 percent higher for Hispanic children (OR=1.52; 95% CI: 1.45, 1.59), compared with White children.

### **Asthma-related Health Care Utilization**

Asthma care is described in Table 4. In 2003, the average number of visits per child was 4.2 (range: 1-32), unchanged from the previous year. Nearly half of the children with asthma (48.6%) had more than one visit for ambulatory care (office or clinic visits, emergency care).

Of the children with asthma, 24 percent had at least one emergency room visit, down significantly from the previous year. The percentage of White children with any emergency care (19%) was lower than the percentages for Black African American children (26%) and Hispanic children (26%). After adjusting for age, gender, primary language, residence and health plan, the likelihood of having had an emergency visit for treatment of asthma was about 30 percent higher for Black African American children (OR=1.36; 95% CI: 1.21, 1.52) and Hispanic children (OR=1.31; 95% CI: 1.18, 1.45), compared with White children.

There were 650 children (4.4%) hospitalized at least once. The percentages of White children and Hispanic children who were hospitalized (4% of each group) were less than the percentage of Black African American children who were hospitalized (5%)



**Note:** Change in rate for infants in 1999-01 compared with later years is most likely due to change in methods for determining age group (midpoint v. end of study period).

### Follow-up after emergency care and hospitalization

Few children who had emergency care for asthma in 2003 received follow-up care for asthma or a related diagnosis within 2 weeks of the visit, as recommended by the National Heart, Lung and Blood Institute (Table 5). By 4 weeks, just 24 percent of children had been seen for any follow-up care for respiratory conditions. Follow-up at 2 weeks after emergency visits varied by health plan.

Overall, 40 percent of those who were hospitalized received follow-up care for asthma or a related diagnosis within 2 weeks (Table 5). By 4 weeks, just 45 percent of children whose symptoms had been severe enough to warrant hospital admission had been seen for any follow-up care. While rates of follow-up care were similar overall in FY 2002 and CY 2003, follow-up care declined significantly in two health plans, Community Health Network and Health Net, between FY 2002 and CY 2003 (Table 5).

### National Data on Asthma Prevalence and Treatment

These results and national data on asthma prevalence and treatment are not strictly comparable due to differences in methods, income and age groups. Nevertheless, data from health surveys and health care provider site surveys provide information that can be used to assess the experience of children in HUSKY A.

Data from the 2002 National Health Interview Survey indicate that 6.1 million children birth to 17 (83 per 1000 children) report having been diagnosed with asthma by a health professional and still having asthma.<sup>10</sup> This figure includes 58 of every 1000 children who reported having had at least one asthma attack in the previous year, an indication of uncontrolled asthma and risk for poor outcomes, such as hospitalization. In HUSKY A, 98 of every 1000 continuously enrolled low-income children had care with an asthma diagnosis in a one-year period. Using hospital

admission as an indication, 52 of every 1000 asthmatic children in HUSKY A had a serious asthma attack in the one-year period.

In 2002, asthma prevalence was higher for boys than girls; higher for poor children, compared with children in higher income families; and higher for children in fair-poor health, compared with healthier children.<sup>11</sup> Asthma prevalence among Non-Hispanic Black children (9%) was twice that among Hispanic children (4%). However, people of Puerto Rican descent have the highest lifetime prevalence, current asthma prevalence, and attack prevalence.<sup>12</sup> Relative differences between subgroups of HUSKY A children are consistent with the differences evident in national data.

In 2002, children 17 and under made an estimated 5 million ambulatory care visits or about 687 per 10,000 children. They made an estimated 727,000 emergency visits (100 per 10,000 children 0 to 17). About 196,000 children were hospitalized (27 per 10,000 children 0-17). Very young children birth to 4 had the highest emergency visit and hospitalization rates. Office visit rates for very young children 0 to 4 and school-aged children 5 to 14 were similar (60.6 and 60.4 visits per 1000 population, respectively). However, very young children had a higher emergency visit rate (141.8 per 10,000 population, compared with 98.5 for every 10,000 children 5 to 14) and higher hospitalization rate (55.4 per 10,000 population, compared with 21.5 for every 10,000 children 5 to 14).<sup>13</sup>

In 2001, hospital admission rates for pediatric asthma ranged from over 300 per 100,000 children in very low income communities (median household income <\$25,000, derived from zip code of residence) to about 140 per 100,000 children in higher income communities (median household income >\$45,000).<sup>14</sup> Mean length of stay was 2 to 2 ½ days, with mean total charge equal to about \$2,500 per day.

Primary care follow-up after emergency care for asthma was the subject of a recent report on asthma care for children.<sup>15</sup> In a study of the effectiveness of interventions aimed at increasing follow-up, children seen in the emergency department for treatment of asthma were randomly assigned to either telephone follow-up (calls on day 2 and day 5 after the visit) with monetary incentive (\$15) or usual practice of recommending a follow-up primary care visit within 72 hours. The 2-week follow-up visit rate for children in the intervention group was just 36 percent, but this rate was significantly higher than the rate for children in the control group (19%). The intervention had no effect on longer-term outcomes. Parents reported difficulties scheduling follow-up when told by providers or office staff that the visit was not necessary. Parents in both groups tended to over-report follow-up, compared with evidence found in medical records. In HUSKY A, 20 percent of children had a follow-up visit after an emergency visit.

## **CONCLUSIONS**

- Nine percent of children enrolled in HUSKY A in 2003 received health care for asthma.
- Persistent racial/ethnic disparities in asthma prevalence exist among children enrolled in HUSKY A.
- Few children who receive emergency care or are hospitalized for asthma receive timely follow-up care, as recommended in treatment guidelines.

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<sup>1</sup> Connecticut Voices for Children is a non-profit organization that conducts research and policy analysis on children's issues. This report on asthma was prepared under a contract with the Connecticut Department of Social Services and a grant from the Hartford Foundation for Public Giving. Performance monitoring in HUSKY A builds on work begun by the Children's Health Council, which was created in 1995 and charged with evaluating the impact of Medicaid managed care on children's health services. Connecticut Voices for Children contracts with MAXIMUS, Inc. for data management and data analysis. This report was prepared by Mary Alice Lee, Ph.D., Senior Policy Fellow.

<sup>2</sup> In 2003, the time frame for the collection and analysis of HUSKY A data was changed from a fiscal year (FY, October 1 through September 30) to a calendar year (CY, January 1 through December 31). Performance monitoring is based on health care received by children continuously enrolled during a specified time period for the following reasons: 1) utilization can be reported in terms of the experience of actual children rather than averaged over "member-months" or varying periods of eligibility; 2) depending on the age groups under study, up to 80% of children ever enrolled during a one-year period were in fact enrolled for 12 months; 3) the HUSKY program and participating health plans are clearly accountable for care of these children; 4) utilization differences among continuously enrolled children are likely to occur among other children as well; and 5) results of performance monitoring can be expressed in simple and consistent terms that convey the actual experience of children in the program.

<sup>3</sup> Asthma-related diagnoses: bronchitis (ICD-9-CM codes 466, 480), bronchiolitis (466.1, 487.1, 491.8), allergies (495.4-495.9, 995.3, 995.2, 995.1, 477.0-477.9), viral and bacterial pneumonia (480.0-487.9, 483, 481, 482.2, 482.3, 482.9, 483, 485, 486) and chronic obstructive pulmonary disease (491, 492, 496).

<sup>4</sup> Buescher PA, Jones-Vessey K. Using Medicaid data to estimate state- and county-level prevalence of asthma among low-income children. *Maternal and Child Health Journal*, 1999; 3(4): 211-216.

<sup>5</sup> Children's Health Council. Asthma and asthma-related health care for Children in HUSKY A: FFY 2002. Hartford, CT: CHC, 2003. In 2002, HUSKY A pharmacy encounter records were searched for preferred primary therapies (2,139 prescription medications) and for any long-term therapies (3,166 prescription medications, including 2,139 preferred primary therapies), using medication lists developed by the National Committee for Quality Assurance for performance monitoring, ([www.ncqa.org](http://www.ncqa.org)). The estimated prevalence based on encounter records for care and prescriptions for preferred primary therapies was 10.5%, compared with 8.1% using records for care alone. The estimated prevalence based on care and prescriptions for any long-term therapy was 17.9%.

<sup>6</sup> National Heart, Lung, and Blood Institute. Guidelines for diagnosis and management of asthma. Bethesda, MD: NHLBI, 1997.

<sup>7</sup> Pearce N, Beasley R, Burgess C, Crane J. Asthma epidemiology: principles and methods. New York: Oxford University Press; 1998.

<sup>8</sup> In 2003, the time frame for the collection and analysis of HUSKY A data was changed from a fiscal year (FY, October 1 through September 30) to a calendar year (CY, January 1 through December 31). Performance monitoring is based on health care received by children continuously enrolled during a specified time period for the following reasons: 1) utilization can be reported in terms of the experience of actual children rather than averaged over "member-months" or varying periods of eligibility; 2) depending on the age groups under study, up to 80% of children ever enrolled during a one-year period were in fact enrolled for 12 months; 3) the HUSKY program and participating health plans are clearly accountable for care of these children; 4) utilization differences among continuously enrolled children are likely to occur among other children as well; and 5) results of performance monitoring can be expressed in simple and consistent terms that convey the actual experience of children in the program.

<sup>9</sup> National Heart, Lung, and Blood Institute. Guidelines for diagnosis and management of asthma. Bethesda, MD: NHLBI, 1997.

<sup>10</sup> Centers for Disease Control and Prevention. CDC asthma surveillance survey: asthma prevalence, health care use and mortality, 2002 (fact sheet). [www.cdc.gov](http://www.cdc.gov).

<sup>11</sup> Dey AN, Schiller JS, Tai DA Summary health statistics for US children: national Health Interview Survey, 2002 (DHHS Pub. No. (PHS) 2004-1549). *Vital and Health Statistics*, 2004; 10(221): 1-78.

<sup>12</sup> Centers for Disease Control and Prevention. CDC asthma surveillance survey: asthma prevalence, health care use and mortality, 2002 (fact sheet). [www.cdc.gov](http://www.cdc.gov).

<sup>13</sup> Mannino DM et al. Surveillance for asthma—United States, 1980-1999. *Morbidity and Mortality Weekly Report*, 2002; 51 (SS01): 1-13.

<sup>14</sup> Simpson L et al. health care for children and youth in the United States: Annual report on patterns of coverage, utilization, quality, and expenditures by income. *Ambulatory Pediatrics*, 2005; 5(1): 6-44.

<sup>15</sup> Smith SR et al. Improving follow-up for children with asthma after an acute emergency department visit. *Pediatrics*, 2004; 145: 772-777.

Table 1. Children in HUSKY A, 2003: Description of the sample

	Total <sup>a</sup>	BlueCare	CHN	HealthNet	Preferred One	Plan Changers
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156
<b>Age</b>						
<1	725	285	130	206	20	84
1-5	49,367	19,385	7,992	15,548	2,051	4,391
6-14	81,303	31,555	13,304	26,126	4,016	6,302
15-20	32,220	12,468	5,530	10,315	1,528	2,379
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156
<b>Gender</b>						
Female	81,034	31,383	13,544	25,724	3,821	6,562
Male	81,803	32,011	13,317	26,170	3,766	6,539
Unknown	778	299	95	301	28	55
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156
<b>Race/ethnicity</b>						
African-American	43,487	16,079	8,217	12,278	2,562	4,351
Hispanic	55,681	22,252	13,978	12,295	2,463	4,693
White	60,736	23,908	4,257	26,214	2,476	3,881
Other groups	3,711	1,454	504	1,408	114	231
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156
<b>Language</b>						
English	149,861	57,575	23,355	49,740	7,145	12,046
Other	1,027	439	180	294	44	70
Spanish	11,940	5,378	3,324	1,855	398	985
Unknown	787	301	97	306	28	55
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156
<b>Residence</b>						
Bridgeport	16,477	2,131	3,414	7,198	1,976	1,758
Hartford	20,991	13,540	2,173	2,567	302	2,409
New Haven	16,045	3,811	7,677	2,178	606	1,773
Other	110,102	44,211	13,692	40,252	4,731	7,216
<b>Total</b>	163,615	63,693	26,956	52,195	7,615	13,156

<sup>a</sup> Children under 21 who were continuously enrolled in HUSKY A between January 1 and December 31, 2003.

Table 2. Children in HUSKY A with Asthma, 2003

	Total <sup>a</sup>						
	BlueCare	CHN	HealthNet	Preferred One	Plan Changers		
<b>Total</b>	15,014	2,801	4,859	586	7.7%	1,480	11.2%
<b>Age</b>							
<1	52	7	18	0	0.0%	5	6.0%
1-5	5,473	901	1,674	197	9.6%	618	14.1%
6-14	7,251	1,437	2,414	299	7.4%	671	10.6%
15-20	2,238	463	782	92	6.0%	196	8.2%
<b>Total</b>	15,014	2,808	4,888	588		1,490	
<b>Gender</b>							
Female	6,596	1,261	2,128	255	6.7%	665	10.1%
Male	8,352	1,540	2,731	331	8.8%	815	12.5%
Unknown	66	7	29	2		10	
<b>Total</b>	15,014	2,801	4,859	586		1,480	
<b>Race/ethnicity</b>							
African-American	3,720	734	1,141	201	7.8%	441	10.1%
Hispanic	6,347	1,739	1,489	249	10.1%	678	14.4%
White	4,694	310	2,156	134	5.4%	351	9.0%
Other groups	253	25	102	4	3.5%	20	8.7%
<b>Total</b>	15,014	2,808	4,888	588		1,490	
<b>Language</b>							
English	13,455	2,360	4,600	546	7.6%	1,329	11.0%
Other	85	16	20	1	2.3%	9	12.9%
Spanish	1,407	425	239	39	9.8%	142	14.4%
Unknown	67	7	29	2		10	
<b>Total</b>	15,014	2,808	4,888	588	7.7%	1,490	11.3%
<b>City</b>							
Bridgeport	1,834	431	792	202	10.2%	235	13.4%
Hartford	1,998	215	263	19	6.3%	285	11.8%
New Haven	1,433	771	185	34	5.6%	154	8.7%
Other	9,749	1,391	3,648	333	7.0%	816	11.3%
<b>Total</b>	15,014	2,808	4,888	588		1,490	

<sup>a</sup> Children with primary or secondary diagnosis of asthma (ICD-9-CM code 493) on encounter records for care in 2003.



**Table 3. Comparison of 2002 and 2003 Prevalence Estimates**

	<b>FY 2002</b>		<b>CY 2003</b>	
	<b>n=140,395</b>		<b>n=163,615</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
<b>Total</b>	11,416	8.1%	15,014	9.2% *
<b>Age</b>				
<1	67	9.7%	52	7.2% *
1-5	4,183	9.8%	5,473	11.1% *
6-14	5,575	7.9%	7,251	8.9% *
15-20	1,591	6.0%	2,238	6.9% *
<b>Gender</b>				
Female	4,947	7.1%	6,596	8.1% *
Male	6,469	9.2%	8,352	10.2% *
<b>Race/ethnicity</b>				
African American	3,021	7.8%	3,720	8.6% *
Hispanic	4,765	9.8%	6,347	11.4% *
White	3,452	6.9%	4,694	7.7% *
Other groups	178	6.4%	253	6.8%
<b>Language</b>				
English	10,346	8.0%	13,455	9.0% *
Spanish	1,009	10.2%	1,407	11.8% *
Other languages	61	7.7%	85	8.3%
<b>Residence</b>				
Bridgeport	1,596	10.7%	1,834	11.1%
Hartford	1,585	8.3%	1,998	9.5% *
New Haven	1,111	7.5%	1,433	8.9% *
Other towns	7,124	7.8%	9,749	8.9% *
<b>Health Plan</b>				
BlueCare	4,120	7.6%	5,222	8.2% *
CHN	2,105	9.8%	2,801	10.4%
Health Net	4,044	8.4%	4,859	9.3% *
Preferred One	417	6.1%	586	7.7% *
Changed plans	730	7.6%	1,480	11.2% *

\* Indicates significant difference (p<.05) between prevalence estimates for FY2002 and CY 2003.

**Table 4. Asthma-related health care utilization**

	<b>FY2002</b>	<b>CY2003</b>
<b>Number of ambulatory care visits (average)</b>	4.1	4.2
<b>Children with more than one visit</b>	48.1%	48.6%
<b>Children with asthma who:</b>		
<b>Had at least one emergency visit</b>	29.0%	23.6%
<b>Were hospitalized</b>	4.3%	4.4%

**Table 5. Follow-up After ER Visit or Hospitalization for Asthma**

	Seen within 2 weeks <sup>a</sup>	
	After ER visit	After hospital discharge
<b>Total</b>	19.7%	39.5%
<b>Health Plan</b>		
<b>BlueCare</b>	21.4%	47.5%
<b>CHN</b>	14.3%	31.7%*
<b>HealthNet</b>	21.9%	37.2%*
<b>Preferred One</b>	16.4%	42.9%
<b>Changed plans</b>	22.0%	38.0%

<sup>a</sup>Ambulatory care visit for asthma or related diagnosis

\* Rate in CY2003 is significantly lower than rate for FY2002